To what extent do organisation-public relationships (OPRs) affect behaviour change in social marketing campaigns promoting physical exercise?

H R DOBSON

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To what extent do organisation-public relationships (OPRs) affect behaviour change in social marketing campaigns promoting physical exercise?

HOWARD ROBERT DOBSON

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Contents

Abstract 15
Declaration 18
Acknowledgements 18
Dedication 18
1. Introduction 19
1.1 Organisation-public relationships (OPRs) 19
1.2 Research background 22
1.2.1 Physical inactivity 23
1.2.2 Recommendations 24
1.2.3 Government policy 25
1.3 Health communication 26
1.3.1 Public health social marketing 27
1.4 Research aim and objectives 33
1.4.1 Research aim 33
1.4.2. Research objectives 33
1.5 Structure of thesis 34
2. Literature review 37
2.1 Organisation-public relationships (OPRs) 39
2.1.1 Concepts and definitions 40
2.1.2 Antecedents of OPR 43
2.1.2.1 Problems with Grunig and Hunt's (1984) approach 43
2.1.2.2 Broom, Casey and Ritchey's (1997) approach to value of OPR 46
2.1.2.3 Relationship cultivation 47
2.1.3 Development of OPR dimensions 50
2.1.3.1 Universality of trust and commitment 51
2.1.3.1.1 Trust 51
2.1.3.1.2 Commitment 54
2.1.3.2 Problems of Ledingham and Bruning's (1998) dimensions 54
2.1.3.3 Superiority of Hon and Grunig (1999) dimensions 61
2.1.3.4 Shortcomings of other approaches 68
2.1.4 Reviews of OPR research 70
2.1.5 Conclusion 74

2.2 Social marketing 76
2.2.1 Key principles 77
2.2.1.1 Voluntary behaviour change is fuelled by attitude 77
2.2.1.2 Social exchange influences communications messaging 78
2.2.1.2.1 Competitive analysis assesses alternative behaviours 81
2.2.1.3 Marketing techniques 84
2.2.1.3.1 The eighth P is Partnership 84
2.2.1.3.2 Marketing models are target-hitting tools 85
2.2.1.3.3 Partnerships lead to cooperation 88
2.2.1.4 End goals 91
2.2.2 Conclusion 92
2.3 Persuasion 94
2.3.1 Models of persuasion 94
2.3.1.1 Reasoned Action Approach 95
2.3.1.1.1 Criticism of the Reasoned Action Approach 99
2.3.1.2 Elaboration Likelihood Model 103
2.3.1.2.1 Criticism of Elaboration Likelihood Model 106
2.3.2 Message-framing 107
2.3.2.1 Strategic cognitive messages need a convincing argument 108
2.3.2.1.1 Framing influences message effectiveness 108
2.3.2.1.2 Framing can influence elaboration 109
2.3.2.2 Affective messages influence belief, trust and attitude 110
2.3.3 Affect 115
2.3.3.1 Emotion formation: initial cognitive activity 116
2.3.3.2 Emotion formation: primary and secondary appraisal 116
2.3.3.3 Registering emotion leads to action tendencies 117
2.3.3.4 Criticism of attribution theory 118
2.3.4 Belief 120
2.3.4.1 Belief within the RAA and ELM 121
2.3.4.2 Cognition and belief 123
2.3.4.2.1 Primary and secondary cognition 124
2.3.4.2.2 Effect of emotions salient before primary cognition 126
2.3.4.2.3 Effect of emotions salient after primary cognition 129
2.3.5 Attitude 132
2.3.5.1 Cognitive attitude is predicted by belief and cognitive trust 133

2.3.5.2 Affective attitude is predicted by belief, affect, affective trust 134
2.3.5.3 Cognitive-affective matching effects....135
2.3.5.3.1 Amplification hypothesis....136
2.3.5.3.2 Crystallisation hypothesis....139
2.3.6 Behaviour....144
2.3.6.1 Attitude is not the only predictor of behavioural intention....144
2.3.6.2 Behavioural intention is not the only predictor of behaviour ..145
2.3.6.3 Certain attitudes as a marketing communications goal....146
2.3.7 Conclusion....148
2.4 Health communications....151
2.4.1 Health communications messaging....152
2.4.1.1 Cognitive message framing....152
2.4.1.1.1 Framing when no risk associated with health behaviour.153
2.4.1.2 Affective health message-framing....156
2.4.1.2.1 Fear appeals at the level of the individual....157
2.4.1.2.2 Other emotional appeals at the level of the individual....158
2.4.1.2.3 Multiple affect may strengthen secondary cognition....160
2.4.1.3 Affect takes a peripheral route with no cognitive response ...166
2.4.1.3.1 Clusters 1 and 2: elaboration likelihood high....169
2.4.1.3.2 Cluster 3: elaboration likelihood low, attitude certainty low 170
2.4.1.3.3 Cluster 4: elaboration likelihood low, attitude certainty high 171
2.4.1.3.4 Discounting other outcomes....175
2.4.2 Conclusion....177
2.5 Conclusion to literature review....179
3. Research philosophy and strategy....183
3.1 Introduction....183
3.2 Research philosophy....183
3.2.1 Ontology, epistemology and axiology....184
3.2.2 Philosophical position....186
3.2.2.1 Positivism....187
3.2.2.1.1 Logical positivism....188
3.2.2.2 Post-positivism and critical realism....189
3.2.2.2.1 Post-positivism....189

3.2.2.2.2 Critical realism 192
3.3 Research strategy 196
4. Research design 198
4.1 Experimental design 198
4.1.1 Sampling frame 200
4.1.2 Sample size 201
4.1.3 Recruitment 201
4.2 Survey instrument development 204
4.2.1 Latent variables 205
4.2.1.1 OPR variables 205
4.2.1.2 RAA variables 206
4.2.1.3 Moderating variables 209
4.2.2 Observed variables 211
4.2.3 Pre-testing of questionnaire 211
4.3 Data collection 212
4.4 Data analysis 215
4.4.1 Descriptive statistics 216
4.4.2 Common method bias 216
4.4.3 Outliers 217
4.4.4 t-tests 217
5. Structural equation modelling 219
5.1 Introduction 219
5.2 Setting up the measurement model 220
5.3 Using Smart PLS 4 224
5.3.1 Establishing the measurement model 227
5.3.2 Testing the structural model 228
5.3.3 Moderator analysis and multigroup analysis 229
6. Results and analysis 232
6.1 Introduction 232
6.2 Data analysis 232
6.2.1 Data screening 233
6.2.2 Descriptive statistics 236
6.2.2.1 Sample profile 236
6.2.2.2 Skewness and kurtosis 237
6.2.3 Common method bias 238

6.2.4 Manipulation checks and quality of clustering 239
6.2.4.1 Manipulation checks 239
6.2.4.2 Quality of clustering 239
6.2.5 Measurement model and structural model evaluation 240
6.2.5.1 Stage 1: measurement model evaluation 240
6.2.5.2 Stage 2: structural model evaluation 245
6.3 Hypothesis testing 245
6.3.1 OPR 247
6.3.1.1 All data (group 1) 248
6.3.1.2 Effects of message-framing (groups 2 to 5) 250
6.3.1.3 Effects of message-framing in Cluster 1 (groups 6 to 9) 251
6.3.1.4 Effects of message-framing in Cluster 2 (groups 10 to 13) 253
6.3.1.5 Effects of message-framing in Cluster 3 (groups 14 to 17) 255
6.3.1.6 Effects of message-framing in Cluster 4 (groups 18 to 21) 258
6.3.1.7 Summary for hypotheses H1a to H4b and H8 260
6.3.2 Reasoned action approach variables 262
6.3.2.1 New behavioural intention 262
6.3.2.1.1 Full dataset (group 1) 263
6.3.2.1.2 Effects of message-framing (groups 2 to 5) 266
6.3.2.1.3 Effects of message frames in Cluster 1 (groups 6 to 9) 267
6.3.2.1.4 Effects of message frames in Cluster 2 (groups 10 to 13) 269
6.3.2.1.5 Effects of message frames in Cluster 3 (groups 14 to 17) 271
6.3.2.1.6 Effects of message frames in Cluster 4 (groups 18 to 21) 273
6.3.2.1.7 Summary for hypotheses H11a to H11d 275
6.3.2.2 Other RAA constructs 276
6.3.3 Moderation effects 279
6.3.3.1 Moderation effects of elaboration likelihood and attitude certainty 279
6.3.3.1.1 Effect on other constructs 283
6.3.3.2 Moderation effect of message frame 284
6.3.3.2.1 Comparing groups 2 to 5 285
6.3.3.3.2 Comparing groups in cluster 1 (groups 6 to 9) 287
6.3.3.3.3 Comparing groups in cluster 3 (groups 14 to 17) 288

6.3.3.3.4 Comparing groups in clusters 2 and 4 289
6.3.3.3.5 Effect of message frame on other constructs in cluster 3 291
6.3.3.3.6 Summary of multigroup analysis 293
6.3.4 Matching effects 296
6.4 Research questions 300
6.4.1 RQ1 300
6.4.2 RQ2 305
6.4.3 RQ3 306
6.5 Additional interesting results from the data 310
6.5.1 Attitude certainty 310
6.5.1.1 Percentages moving to range of attitude certainty 312
6.5.2 Processing fluency 314
6.6 Conclusion 315
7. Discussion 317
7.1 Introduction 317
7.2 Analysis of full dataset 319
7.3 Analysis of clusters 322
7.3.1 Cluster 1: high ELM, low certainty (groups 6 to 9) 322
7.3.1.1 OPRs 322
7.3.1.2 Matching effects 323
7.3.2 Cluster 3: low ELM, low certainty (groups 14 to 17) 328
7.3.2.1 OPRs 328
7.3.2.2 Matching effects 330
7.3.3 Cluster 2: high ELM, certain attitude (groups 10 to 13) 333
7.3.3.1 OPRs 333
7.3.3.2 Matching effects 334
7.3.4 ELM low, certain attitude: Cluster 4 336
7.3.4.1 OPRs 336
7.3.4.2 Matching effects 336
7.3.4.2.1 Affective negative message frame 337
7.3.4.2.2 Cognitive positive message 338
7.4 Subjective norm 341
7.5 Self-efficacy 343
7.6 Customer journeys 345
7.6.1 Central route and peripheral route 346

7.6.2 Longer customer journeys 347
7.7 Contributions to knowledge 351
7.7.1 OPRs 351
7.7.1.1 Affective trust 351
7.7.1.2 Three elements of cognitive trust 352
7.7.1.3 A new model of OPRs 352
7.7.1.4 A new measurement scale for trust 355
7.7.1.5 OPRs and message framing in clustered data 356
7.7.1.5.1 Influence of OPR within cognitive negative framing 357
7.7.2 Persuasion 358
7.7.2.1 Matching effects 359
7.7.2.1.1 Elaboration likelihood constrained high 359
7.7.2.1.2 Influence of message content 360
7.7.2.1.3 Influence of valence 361
7.7.2.2 Two dimensions of attitude 361
7.7.2.3 Reasoned Action Approach 362
7.7.2.3.1 Emotions influencing affective attitude 363
7.7.2.3.2 Subjective norm and self-efficacy 363
7.7.3 Social marketing theory 364
7.8 Managerial and policymaker implications 365
7.8.1 Cluster 1: high ELM, low certainty 366
7.8.2 Cluster 3: low ELM, low certainty 368
7.8.3 Cluster 2: high ELM, high certainty 370
7.8.4 Cluster 4: low ELM, high certainty 371
7.8.5 Issuing a single message frame 372
7.9 Limitations 375
7.10 Future research 378
8. Conclusion 382
8.1 Meeting of research aim 383
8.1.1 Most effective pathways to changing behavioural intention 383
8.1.2 Effect of OPR compared to affect and belief 384
8.1.3 Contribution of affective trust to influence of OPR 385
8.1.4 Updated model of OPR for social marketing campaigns 387
8.1.5 Implications for policymakers and social marketing practitioners 389

8.2 Extent OPR affects behaviour change 389
Appendix 1: Conclusions of Broom, Casey and Ritchey (1997) 393
Appendix 2: Axioms of OPR from Ledingham (2003) 395
Appendix 3: Relationship dimensions of Ledingham and Bruning (1998) 397
Appendix 4: Ethical approval 398
Appendix 5: Questionnaire 399
Appendix 6: Variables and indicators 416
Appendix 7: Social media advert 421
Appendix 8: Sample distribution profile 422
Appendix 9: Descriptive statistics 423
Appendix 10: t-test results 427
Appendix 11: Discriminant validity results 435
Appendix 12: Collinearity of inner reflective constructs results 438
Appendix 13: 21 path diagrams (for all data and the four clusters) 439
References 454

List of figures

Figure 2.1: Flowchart of the main findings of this literature review.....38
Figure 2.2: Antecedents, concept and consequences of relationships, from Broom, Casey and Ritchey (1997).....46
Figure 2.3: Positioning Hon and Grunig's (1999) relationship cultivation strategies between antecedents and concept.....48
Figure 2.4: The relationship between the OPR dimensions used in this research study, based on Hon and Grunig (1999), Bortree (2015), Kim (2013), Jones (1996) and McAllister (1995).....53
Figure 2.5: Relationships between Hon and Grunig's (1999) four OPR dimensions, taken from Bortree (2015) and Ki and Hon (2007b).....65
Figure 2.6: Duane's (2012) model for social media partnerships.....89
Figure 2.7: The Reasoned Action Approach (Fishbein and Ajzen, 2010). 96
Figure 2.8a: Conceptual model connecting the variables from the Reasoned Action Approach used in this study to the OPR dimensions. 102
Figure 2.8b: Conceptual model expanded to include the moderating variable elaboration likelihood. 106
Figure 2.8c: Conceptual model including the moderating variable message framing and the connection between emotions and OPR.....114
Figure 2.8d: Conceptual model expanded to include the link between OPR and belief. 122
Figure 2.8e: Conceptual model expanded to include the moderating variable attitude certainty.....138
Figure 2.8f: Conceptual model including hypotheses for pathways 174
Figure 4.1: Structural model.....199
Figure 5.1: Measurement and structural models models 222
Figure 5.2: Model used to test for moderator effects of message frame in new behavioural intention construct 230
Figure 6.1: Final path diagram for all data showing significant and meaningful relationships.....265
Figure 6.2a: Group 6 in Cluster 1, affective negative message frame 302
Figure 6.2b: Group 15 in Cluster 3, affective positive message frame.....303
Figure 6.2c: Group 16 in Cluster 3, cognitive negative message frame, containing OPR dimensions.....304
Figure 7.1: Proposed new model of OPR 354

List of tables

Table 2.1: Development of OPR dimensions in the Bruning and Ledingham cluster 55
Table 2.2: Relationship outcomes from Hon and Grunig (1999) 61
Table 2.3: The most effective message frame for attitude change in relation to existing attitude and elaboration likelihood. 142
Table 2. 4: Effect of cognitive message and affective message on belief and elaboration, during primary cognition and secondary cognition 162
Table 2.5: The message frame expected to be the most effective within the four clusters used within this research study. 168
Table 3.1: Comparison of research philosophies. 184
Table 4.1: Summary of variables divided into categories 204
Table 4.3: How the data is divided into 16 groups in a 2x2x2x2 analysis. ...215
Table 5.1: Project and model set-up within Smart PLS 4 223
Table 6.1: The number of responses in the 21 data groups 235
Table 6.2: Stage 1: measurement model evaluation 243
Table 6.3a: Evaluation of affective trust construct for groups 1 to 5: relationship between cognitive trust and affective trust 249
Table 6.3b: Evaluation of cognitive attitude construct for groups 1 to 5: relationship between cognitive trust and cognitive attitude 249
Table 6.3c: Evaluation of affective trust construct for groups 6 to 9: relationship between cognitive trust and affective trust 252
Table 6.3d: Evaluation of new cognitive attitude construct for groups 6 to 9: relationship between cognitive trust and cognitive attitude 252
Table 6.3e: Evaluation of affective trust construct for groups 10 to 13: relationship between cognitive trust and affective trust 254
Table 6.3f: Evaluation of new cognitive attitude construct for groups 10 to 13: relationship between cognitive trust and cognitive attitude 254
Table 6.3g: Evaluation of affective trust construct for groups 14 to 17: relationship between cognitive trust and affective trust 257
Table 6.3h: Evaluation of new cognitive attitude construct for groups 14 to 17: relationship between cognitive trust and cognitive attitude 257
Table 6.3i: Evaluation of affective trust construct for groups 18 to 21: relationship between cognitive trust and affective trust 259
Table 6.3j: Evaluation of new cognitive attitude construct for groups 18 to 21: relationship between cognitive trust and cognitive attitude 259
Table 6.4: Number of groups where OPR hypotheses are accepted 261
Table 6.5a: Evaluating groups 1 to 5 for the new behavioural intention construct 264
Table 6.5b: Evaluating groups 6 to 9 in cluster 1 for the new behavioural intention construct 268
Table 6.5c: Evaluating groups 10 to 13 in cluster 2 for the new behavioural intention construct 270

Table 6.5d: Evaluating groups 14 to 17 in cluster 3 for the new behavioural intention construct.....272
Table 6.5e: Evaluating groups 18 to 21 in cluster 4 for the new behavioural intention construct.....274
Table 6.6: Number of groups hypotheses are accepted when investigating influence of predictors of new behavioural intention 275
Table 6.7: Number of groups hypotheses are accepted when investigating influence of belief and emotions 278
Table 6.8: Moderator analysis for new behavioural intention using all data .281
Table 6.9a: Multigroup analysis (comparing groups 2, 3, 4, 5) 286
Table 6.9b: Multigroup analysis (comparing groups 6, 7, 8, 9 in cluster 1) ..286
Table 6.9c: Multigroup analysis (comparing groups 10, 11, 12, 13 in cluster 2) 286
Table 6.9d: Multigroup analysis (comparing groups 14, 15, 16, 17 in cluster 3) 286
Table 6.9e: Multigroup analysis (comparing groups 10, 11, 12, 13 in cluster 4) 286
Table 6.9f: Multigroup analysis for the belief construct 292
Table 6.9g: Multigroup analysis for the affective trust construct 292
Table 6.9h: Multigroup analysis for the cognitive attitude construct.....292
Table 6.9i: Multigroup analysis for the affective attitude construct.....292
Table 6.10: Results of hypothesis tests for moderation effects of message framing.....295
Table 6.11: Results of matching effects hypothesis tests 299
Table 6.12a: Total effect on new behavioural intention for group 6 in cluster 1 (affective negative message frame).....308
Table 6.12b: Total effect on new behavioural intention in group 15 (affective positive message frame) and group 16 (cognitive negative message frame) in cluster 3. 308
Table 6.13: Percentages of respondents in groups in clusters 1 and 3 moving from the range of low attitude certainty to high attitude certainty following the message 312
Table 6.14: Pre-marketing message exposure vigorous exercise results for all data and the four clusters 313
Table 6.15: Most effective message frame, presence of OPR dimensions and percentage moving to certain attitude, for all data and each cluster 316
Table 7.1: Summary of main findings in the four clusters 344

Glossary of key acronyms

BLMK	Bedfordshire, Luton and Milton Keynes Health and Care Partnership	Healthcare partnership including NHS organisations (hospital trusts, ambulance trusts and community and mental health services), local authorities, voluntary and community sector organisations and others.
ELM	Elaboration Likelihood Model	Dual-process model within which messages can be processed through central or peripheral routes.
OPRs	Organisation-public relationships	Relationships between the public and organisations providing economic, social, political and/or cultural benefits to all parties involved, and characterised by mutual positive regard.
PLS	Partial least squares	A method of modeling relationships between a dependent variable and other explanatory variables
PSA	Public service announcement	A message shared with the general public that raises awareness about an issue.
RAA	Reasoned Action Approach	Integrative model for the prediction and change of social behavior.
SEM	Structural equation modelling	Statistical technique for testing relationships between a framework of variables
WHO	World Health Organization	United Nations agency aiming to connect nations, partners and people to promote health, keep the world safe and serve the vulnerable.

Abstract

This study conducted an experiment to investigate the degree to which organisation-public relationships (OPRs) between an integrated healthcare partnership and members of the public influence behavioural intention within a social marketing campaign promoting physical exercise. The study paid particular interest to the effects of affective trust, an OPR dimension previously untested in public relations literature. The experiment responded to calls by the World Health Organization (WHO) for effective communications to address the health problems associated with the rising incidence of obesity and sedentary lifestyles across the globe.

Social marketing typically seeks to issue the most effective message frame via a social exchange, often opting for an affective message. However, matching effects theory dictates that communications messages should be tailored to factors at the level of the individual, such as cognitive/affective attitude base, elaboration likelihood and attitude certainty. This study tested whether the persuasiveness of OPRs leads to an alternative approach to optimal message frame selection. The conceptual model therefore combined variables from the popular persuasion model the Reasoned Action Approach (RAA), the Elaboration Likelihood Model (ELM), matching effects theory and OPR theory.

As the assumption of homogenous data characteristics is unrealistic, respondents, recruited via Facebook in Bedfordshire, UK, were divided into four clusters, by elaboration likelihood (high/low) and attitude certainty (high/low).

These variables acted as moderators. Respondents were shown one of four marketing message frames at random (cognitive/affective, positive/negative) to quantify the varying influence of message frame within the clusters. Hence message frame was also included as a moderator.

Analysis using partial least squares structural equation modelling (PLS-SEM) found that OPRs with an integrated health partnership played a persuasive role in a cluster characterised by low elaboration likelihood and low attitude certainty following a negative cognitive message frame. This included a pathway from affective trust to behavioural intention. This was not the most persuasive message frame in that cluster. As predicted by matching effects theory, respondents in the cluster preferred a mismatching positive affective message frame. However, the rationale for selecting the most effective message frame in the cluster was challenged due to the persistent persuasiveness of OPRs, and also self-efficacy, both offering social marketers more enduring behaviour change. The negative cognitive message frame also offered higher levels of post-message exposure attitude certainty compared to the leading message frame, this also associated with more enduring behaviour change. Practitioners should consider issuing a negative cognitive message frame for this cluster rather than an affectively based message frame.

Although OPRs did not play a persuasive role in other circumstances, they potentially play a key persuasive role for 50% of adults on a customer journey from low to high attitude certainty with regard to physical exercise. Results

within other clusters suggested that a negative cognitive message frame may also be the most effective overall.

Researchers are advised to use an updated scale for measuring OPRs including indicators for affective trust. Recommendations for future research include investigating further the conditions for which OPRs have a persuasive influence following the issuing of communications. Future research could also study the relationship between behavioural intention and behaviour over time for physical exercise social marketing when OPRs have a persuasive influence.

Declaration

I confirm that no portion of the work referred to in the thesis has been submitted in support of an application for another degree or qualification of this or any other university or other institute of learning.

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Dedication

For Gordon and Brenda Dobson

For Marie Dobson

For John and Leo Dobson to encourage a love of learning

For Heather, Paul, Alex and Aidan Daykin

1. Introduction

The growing incidence of obesity in the UK and the serious health conditions it leads to threaten to financially cripple the National Health Service (NHS) (Wang et al., 2011). One cause of obesity is low levels of physical activity (NHS, 2023). Guidelines recommend that adults aged 19 to 64 perform at least 75 minutes of vigorous intensity activity or 150 minutes of moderate intensity activity per week (NHS, 2021). Changing the behaviour of adults to improve levels of physical activity means influencing the constructs that affect attitude and behaviour, such as beliefs on a topic, the relationship individuals have with their health authority and the emotions associated with physical exercise (Fishbein and Ajzen, 2010; Browning and Yang, 2022).

The introduction to this thesis begins with a short introduction to the main area of interest of this study: organisation-public relationships (OPRs). This is followed by sections on the public cost of physical inactivity, behaviour change recommendations from global and national organisations, UK government policy to tackle obesity, and previous public health campaigns.

1.1 Organisation-public relationships (OPRs)

The relationship between an organisation and its publics is a strong persuasive force. Researchers have concluded that such relationships influence attitude, advocacy or behaviour in a wide range of contexts within the public and private sector (Ledingham and Bruning, 1998; Bruning and Ledingham, 1998; Bruning,

Dials and Shirka, 2008; Ki and Hon, 2007a; Ki, 2013). Within public relations, the study of the relationship between an organisation and its publics has been documented in OPR literature, which describes an OPR as providing "economic, social, political and/or cultural benefits to all parties involved, and is characterised by mutual positive regard" (Ledingham and Bruning, 1998:62).

There are many key milestones in the history of public relations: propaganda sent back from the first settlements on the East Coast of America in the 1500s; pre-American Revolution rallying to fuel revolt in the 1700s; Barnum's entertainment publicity in the mid-1800s; and the birth of corporate and government information in the late 1800s (Cutlip, 1995). The study of OPRs is traced back 40 years to Ferguson's (1984) visionary conference paper, recently republished due to the magnitude of its influence (Ferguson, 2018). Since the 1980s, OPR theory has become the second largest area of public relations research (Coombs and Holladay, 2015), and Ferguson (2018) has become the most cited *Journal of Public Relations Research* article since publication (Browning and Yang, 2022).

Many of the 158 OPR studies exhaustively reviewed by Cheng (2018) aimed to develop the measurement of OPR. Hon and Grunig's (1999) four OPR dimensions (control mutuality, satisfaction, trust and commitment) have inspired the largest cluster of studies measuring OPRs (Huang and Zhang, 2015). As researchers have yet to answer Ferguson's (1984) call to measure relationships independently of organisations and publics, these four dimensions

are based on self-reported data supplied by publics, and capture the consequences of relationships that, once initiated, have been cultivated strategically (Broom, Casey and Ritchey, 1997; Hon and Grunig, 1999) with dialogue and engagement (Kent and Taylor, 2002; Kang, 2014).

In addition to analysing the effect of OPRs on dependant variables such as attitude and behaviour, researchers have found that different types of organisation will be able to exert differing levels of persuasiveness via OPRs: Hon and Grunig (1999) found that respondents' relationship with the charity Red Cross was stronger than their relationship with the technology corporation Microsoft, which was stronger than their relationship with the American National Rifle Association.

Despite its emergence as a research paradigm, there are significant research gaps which have not been highlighted by reviews of OPR literature (Cheng, 2018; Ki and Shin, 2006; Huang and Zhang, 2015; Coombs and Holladay, 2015). No OPR studies explore the effect of a relationship with an organisation on behaviours not directly supplied by the organisation. For example, in the UK the NHS promotes ideal levels of physical exercise (75 minutes of vigorous activity for adults aged 19 to 64) (NHS, 2021) and yet does not own gyms; hence the public must be motivated to perform physical exercise independently of the organisation telling them to do so.

Neither has the role of OPRs been quantified within the results of social marketing. For instance, if individuals have a relationship with their local health authority, it is not clear how OPR improves the results of a message promoting physical exercise. As communications messages attempt to influence belief on a topic and/or emotions associated with it, the boost supplied by OPRs remains unresearched. How that boost increases or decreases according to whether messages are positively or negatively framed is also a research gap. Investigating these research gaps could make social marketing promoting physical exercise more effective.

Despite the popularity of Hon and Grunig's (1999) scale, it focuses on the effect of cognitive trust (driven by thoughts and beliefs) and does not account for the contribution of affective trust (driven by emotions and feelings) and this remains a research gap.

1.2 Research background

This section 1.2 is structured as follows. A focus on statistics quantifying levels of physical activity in society, such as those released by the World Health Organization (WHO), reveals that the incidence of obesity is increasing (WHO, 2018). Recommendations on how to proceed using strategic communications are followed firstly by a brief analysis of UK government policy and secondly a review of previous UK public health campaigns tackling obesity and physical inactivity.

1.2.1 Physical inactivity

Physical inactivity costs the NHS up to £1 billion each year, with additional indirect costs of £8.2 billion according to a report by the Department for Transport (DfT) in 2014 on the economic benefits of walking and cycling (Department for Transport, 2014). There were over a million hospital admissions due to obesity in 2019-2020 (Hutchinson, 2021). In the UK In 2016, 63.7% of adults in the UK aged over 18 were overweight or obese (BBC News, 2020). According to official figures, 28% of adults in England are obese - meaning fat accounts for more than 30% of body weight - with the rate almost doubling from 15% since 1993 (BBC News, 2021). An article in *The Lancet* estimates that more than a billion people in the world are obese (NCD Risk Factor Collaboration, 2024).

Physical inactivity is a worldwide phenomenon. According to the Australian Institute of Health and Welfare, it is estimated that 75% of adults aged 18 to 64 did not meet both the physical activity component and the muscle-strengthening component of national guidelines in 2020 (AIHW, 2023). The continuous trend towards physical inactivity has been attributed to decreased exercise participation during leisure time, increased sedentary behaviour and powered transportation (WHO, 2018).

These statistics have led national and international organisations to make strong recommendations to improve the situation.

1.2.2 Recommendations

As physical inactivity has become a global issue, the WHO has urged action to occur at a global, regional and local level in order to increase participation in physical activity by all ages. This is because physical activity is considered a preventative behaviour with many benefits for individuals including improved fitness and bone health, reduced risk of hypertension, cardiovascular disease, diabetes, stroke, depression, cancer and falls as well as maintaining a healthy weight (WHO, 2018).

WHO (2018) recommends raising awareness of the benefits of physical activity through the use of mass media. Whether education is being communicated using mass media or by local health professionals, it is important that the information is being delivered in an efficient, effective and persuasive way in order to influence behaviour change. This is because message framing can influence health decision-making and motivate behaviour change (Williams et al., 2019).

Recognising there are also benefits to national and local health departments and other government departments, Department for Transport (2014:6) recommends “investment in infrastructure or behaviour change programmes which enable increased activity levels amongst local communities through cycling and walking”. This is likely to “provide low cost, high-value options providing benefits for our individual health. This improvement also has major

benefits for the NHS in terms of cost savings, for the transport system as a whole, and for the economy through more efficient use of our transport networks."

1.2.3 Government policy

The UK government has been trying to tackle obesity for 20 years. More than 12 policies or white papers have been published since 1997 (BBC News, 2020). In 2008, a report on obesity aimed to improve diets, increase exercise and form personalised help for tackling the problem. Two key targets were:

- reverse the trend of rising obesity
- reduce childhood obesity levels to 2000 levels by 2020

In the UK, government policy has focused on promoting healthy foods. Supermarkets were expected to remove promotions of food and drinks high in fat, salt or sugar (HFSS) from key locations (such as store entrances, checkouts and aisle ends) by October 2022 (Department of Health and Social Care, 2023). In addition, food manufacturers have been encouraged to take steps to reduce sugar and salt in their products. Kellogg's announced further reformulations to cereal products Special K, Corn Flakes, Coco Pops and Rice Krispies, promising they would be non-HFSS by the end of 2022 (Woolfson, 2021). Mars has similarly reformulated its products (Food and Drink Federation, 2023). A ban on television advertisements for junk food before 9pm will be introduced in 2025 (Boyd and Fatima, 2024).

Despite some progress being made, the Annual Health Survey for England 2019 concluded that obesity continued to increase across age groups up to 75 years old (NHS, 2020).

However, the UK government's strategy recognises that healthy living is not just about making healthy food options available as it is also down to individuals' efforts to exercise and live healthily. In October 2021, Lord Robathan stated in the House of Lords that it was important to push individual responsibility (BBC News, 2021). The individual responsibility to engage in more physical activity has been promoted through health communication.

1.3 Health communication

A report from the WHO declared that "health communication is seen to have relevance for virtually every aspect of health and well-being, including disease prevention, health promotion and quality of life" (Rimal and Lapinski, 2009: 247). However, compared to the private sector, the public sector has historically devalued the managerial function of public relations and lacked skillful professionals to perform public relations responsibilities (Liu, Horsley and Levenshus, 2010). Public health social marketing has often failed to increase levels of physical activity substantially, as seen in the following section.

1.3.1 Public health social marketing

Various public health campaigns have been launched in the UK and around the world to tackle the growing problem of obesity. For example, in the UK's PHE Strategy 2020-2025, "healthier diets, healthier weights" is listed as one of 10 priorities (Public Health England, 2019). This section critically examines the UK's *Better Health* campaign.

Targeting adults over 18, with a focus on those aged 40 to 60, Public Health England (PHE) relaunched its *Better Health* campaign in January 2021 covering different strands of activity, such as exercising and smoking cessation. Devised in response to the coronavirus pandemic, the campaign showed the public the simple steps they could take to a healthier lifestyle. Various media were used: television and radio adverting, targeted OOH (out of home) advertising, social media and online searches. On-demand videos feature members of the public using new phone apps: the *Couch to 5k* running app and the *Active 10* app encouraging daily walks. All messaging directs individuals to the *Better Health* webpage (www.nhs.uk/BetterHealth) featuring an online quiz, downloads and offers from weight management and physical activity partners (Public Health England, 2021a).

It is interesting to focus on message framing within the wider campaign. Positively framed, the *Better Health* adverts delivered simple messaging promoting the benefits of overcoming weight gain or obesity (for example, lower

risk of getting Covid-19 and cancer), while featuring light-hearted clips of overweight individuals exercising and running. Given that people generally know that exercise makes them fitter and healthier and qualifies as forced information (something well known by all such as who is the King of England) (Festinger, 1957), this approach may persuade people who are familiar with the topic who are looking for more information on how to start exercising and are happy to click through to the fact-filled website (Petty and Briñol, 2015). Ni et al. (2019) finds that those with higher levels of problem recognition and involvement recognition are more likely to seek and share public health information. It has been proven that a segment of society is already convinced by the benefits of exercising exists. In a survey of 5,000 people aged 40-60 in the UK, exercising more was a top priority for 41 per cent (Public Health England, 2021b). The promotional information issued by *Better Health* may have acted as a nudge effect for those already exercising or who wish to start exercising (Handel, 2015).

However, those who are not interested in a topic, in this case physical exercise, are more likely to be persuaded by simple cue effects, such as those generated by emotionally based message frames, rather than making cognitive effort, according to the ELM, which examines the likelihood of individuals thinking more about a topic (Petty and Cacioppo, 1986). It is unlikely further thinking will take place as these individuals are not motivated enough to do so, hence persuasion derives from the experiencing of emotions (Dillard et al, 1996). Without a message appealing to the emotions (for example, the friends that can be made exercising and the feelings of joy from getting active) health

messaging may not be able to change behaviour (Hastings and Domegan, 2014). Interestingly, in an analysis of 70 award-winning television marketing campaigns focusing on public health, 61 did not attempt to persuade using numerical evidence and 40 did not use health risk information in messaging (Meng, Pan and Reber, 2016).

Although it is likely that feelings of happiness were experienced by viewers as individuals absorbed the *Better Health* messages, a more emotionally based message might have been a better approach to encourage individuals who do not exercise regularly to change exercising behaviour. However, behaviour predominantly based on the effect of emotions is not always enduring, as emotions can change quickly (Petty and Cacioppi, 1986) and individuals could quickly revert back to a life of inactivity. Other approaches could be taken to improve message effectiveness. For example, attitudes and behaviour have also been found to be based on more enduring factors such as (1) self-efficacy, which is included as a variable within the RAA along with belief, attitude and behaviour (Fishbein and Ajzen, 2010) and (2) OPRs (Ledingham, Bruning and Wilson, 1999).

Focusing on OPRs in social marketing is a viable option for changing behaviour. Although *Better Health* resources will be available indefinitely, the scheduled 2021 promotional campaign ended in February 2021. This could have a negative effect on campaign outcomes. Johnston and Lane (2018) conclude that episodic campaigns are not as effective as ongoing relationship

management and may even damage the persuasiveness of relationship capital. *Better Health*'s campaign resources do not seem to attempt to build trust (integrity, capability, dependability, benevolence) limiting opportunities to build OPR, which is unfortunate. Taking a situational approach (Kim and Grunig, 2011) within public health communications, Ni et al. (2019) conclude that trust has a direct relationship with information attending (reading information discovered passively) and an indirect relationship with information seeking (reading information discovered actively), information sharing, information attending and information forwarding, via problem recognition and involvement recognition. The study also finds that improved levels of the OPR dimension control mutuality can lead to higher levels of self-efficacy and hence constraint recognition. This means that individuals have a greater sense of being able to meet their own capabilities, which Ni et al. (2019) report can lead to more information sharing and information forwarding.

The test of any public health social marketing initiative is the resulting uplift in behaviour change. Data is not yet available regarding the success of the second phase of the *Better Health* campaign. However, public reactions to the initial phase of the campaign, focusing on weight loss and promoting an updated NHS weight loss plan as a smart phone app, within which user recorded calories, exercise and fruit and vegetable intake weekly, were mixed. In a content analysis of social media posts about the campaign, Talbot and Branley-Bell (2021) report that some individuals complained of inconsistent messaging, with the campaign co-existing with the *Eat Out to Help Out* campaign promoting the catering industry during the covid pandemic, and

Better Health television adverts sometimes immediately followed by adverts for fast food restaurants. Some social media users saw the campaign as a surface-level solution, not respecting the complexity of factors behind physical inactivity and obesity. A UK government evaluation (Public Health England, 2021c) reported there were 864,403 downloads of the updated NHS weight loss app (a key call to action) up to 9 February 2021 (81.5% female) but only 8,305 (0.96%) remained on the 12-week weight-loss programme to the end. In terms of sustained behaviour change, 67% of those completers (5,564 people) continued to use the 12-week plan past 12 weeks. Those who completed the 12-week plan reported an average reduction of 6.5% of their starting body weight. With regard to daily amounts of physical activity, 34% of completers (2,823 people) reported an increase compared to their first entry, whereas 51% of completers (4,152 people) reported a decrease compared to their first entry. Those who increased their physical activity increased from around 30 to 55 minutes per day. The report recommends (1) messaging appealing to men, (2) the use of behavioural nudges to bolster retention rates and (3) evaluating the 12-week plan beyond 12 weeks as “obesity is a chronic relapsing condition that requires long-term support” (Public Health England, 2021c:18). A report on the second phase of the campaign has not been published.

Indeed, the success of public health social marketing initiatives can be limited. Latimer, Salovey and Rothman (2007) mention the large-scale US Center for Disease Control’s VERB mass media campaign promoting physical activity for children aged nine to 13 years (Huhman et al., 2007). This comprehensive campaign used multiple channels and on-going exposure to deliver key

messages. When calculating the persuasiveness of the campaign, effect sizes on correlation coefficients were found to be relatively small (ranging from r=.06 to r=0.12).

Having shown that public health message framing is an important consideration, while simultaneously considering the effects of OPRs, when promoting physical exercise, the following section will summarise this PhD's aim and objectives.

1.4 Research aim and objectives

This section lists the aim and objectives of this PhD research study.

1.4.1 Research aim

The aim of this research is to analyse the relative influence of OPRs, belief and affect (emotions) on behavioural intention within a social marketing campaign promoting physical exercise.

1.4.2. Research objectives

The following research objectives have been set:

1. To determine the most effective pathways to influencing behavioural intention using four message frames, in a model containing variables from OPR theory, the RAA and the ELM.
2. To calculate the relative effect of OPRs on behavioural intention compared to affect and belief.
3. To assess the contribution of affective trust to the influence of OPRs.
4. To contribute an updated OPR model for social marketing campaigns promoting physical exercise.
5. To report on implications for policymakers and social marketing practitioners on the most effective ways to impact public health.

1.5 Structure of thesis

The overall structure of this thesis is as follows:

Chapter 2 contains a literature review examining four areas of literature: **OPRs**, **persuasion**, **social marketing**, **health communications**.

Section 2.1 focuses on **OPR** literature, exploring the relationship between OPR dimensions. OPR is theorised to predict attitude via one pathway and predict belief via a second pathway.

Section 2.2 reviews **social marketing** literature, finding that effective messaging redefines the value of an activity such as physical activity, over and above the long-term benefits of exercising.

Section 2.3 investigates **persuasion** literature, drawing from the RAA for the conceptual model. Within the conceptual model, belief predicts attitude, which predicts behavioural intention. Emotions are a background factor, predicting belief, but they also have a direct relationship with affective attitude. The variables moderating the relationships between these variables are also explored.

Section 2.4 reviews **health communications** literature, concluding that when promoting physical exercise, individuals can be divided into four clusters situationally, based on elaboration likelihood and attitude certainty.

As these literature reviews progress, research questions and research hypotheses are formed.

Chapter 3 explains the research philosophy and strategy, explaining why a critical realism philosophy was taken, recognising that the experiment captures numerical data in the empirical domain, which will contain errors compared to the truth found in the actual domain, due, for example, to data being self-reported via a questionnaire. However, the data can be analysed in an attempt to understand the mechanisms of the real domain (such as the effects of elaboration likelihood and OPR on physical exercise).

Chapter 4 describes the research design, focusing on sample selection, the recruitment of respondents, the experimental design, the development of a survey instrument and methods of data analysis for testing the quality of data.

Chapter 5 describes setting up the model in Smart PLS 4, the algorithms and settings used, and the rules and assumptions followed as part of analysis process. It explains how structural equation software Smart PLS was used to analyse data divided into four clusters, to ascertain which of the four message

frames (affective negative, affective positive, cognitive negative, cognitive positive) would be the most effective for each cluster of individuals.

Chapter 6 contains the results and analysis of the experiment. Results show that OPR does play a role in influencing behavioural intention. This role varies depending on three things: (1) elaboration likelihood, (2) the certainty of individual's existing attitudes towards physical exercise and (3) the framing of the message delivered. When attitude certainty is low, elaboration likelihood is low and when a message frame is cognitive and negative in nature, OPR plays a persuasive role.

Chapter 7 discusses the implications of these results for the OPR literature, lists contributions to knowledge and considers the implications for social marketing practitioners delivering public health campaigns and policymakers.

Chapter 8 concludes this thesis by summarising how the research aims were met to answer the question in the title of this PhD research study.

2. Literature review

Four areas of literature are reviewed to meet the research aim, prior to the formation of research questions and hypotheses, as summarised in figure 2.1.

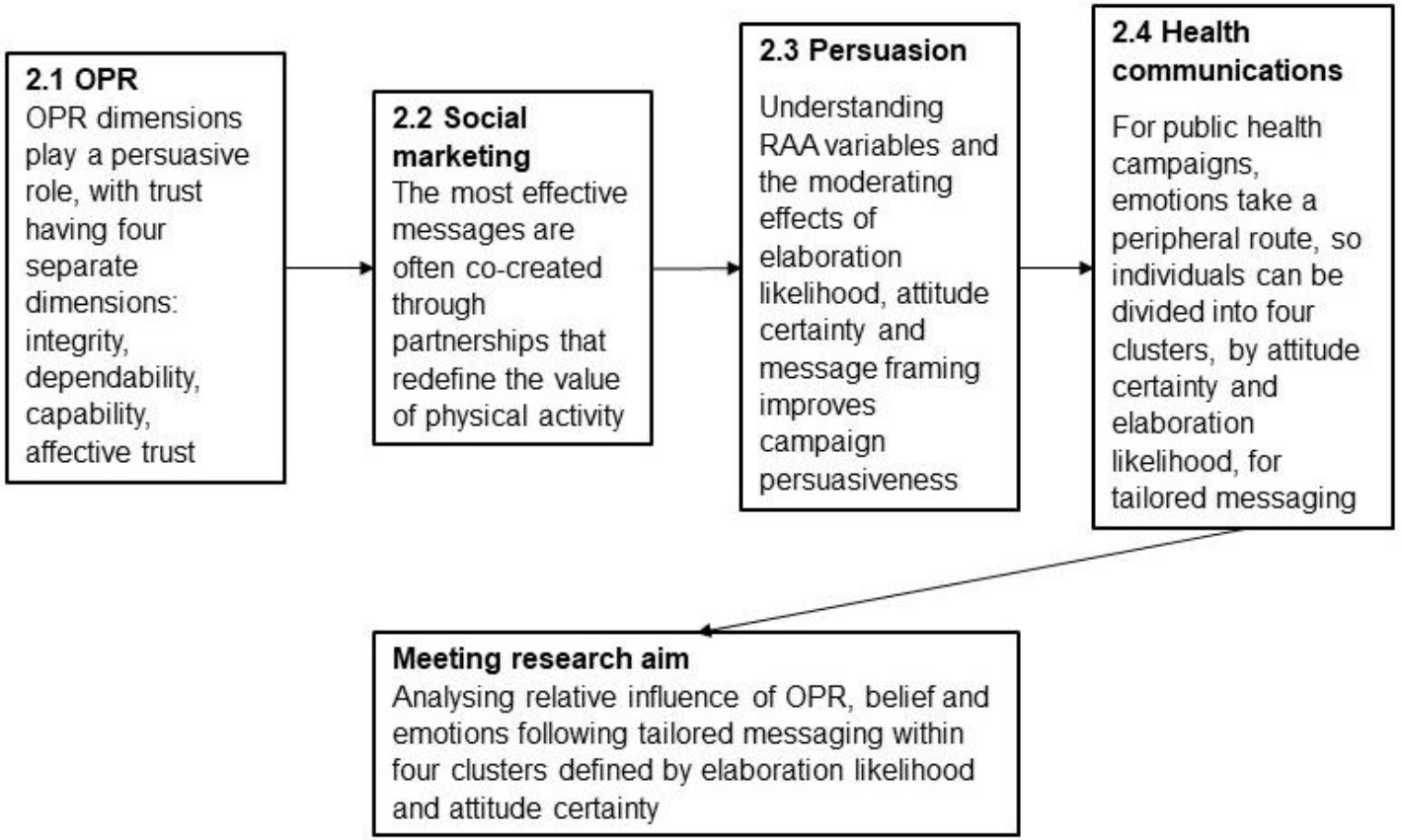
Section 2.1 focuses on the organisation public relationship (OPR) literature, exploring the relationship between OPR dimensions for the conceptual model. The most relevant OPR dimensions are control mutuality and trust, with trust having four elements: integrity, capability, dependability, affective trust.

Section 2.2 reviews social marketing literature, finding that communicating with stakeholders is important to form effective messaging that redefines the value of physical activity over and above the long-term benefits to the public.

Section 2.3 adds variables from the Reasoned Action Approach (RAA) persuasion model to this PhD study's conceptual model. Belief, affect, attitude, behavioural intention and behaviour are explored in detail to understand how they can be influenced, with reference to the Elaboration Likelihood Model (ELM). The relationships between variables in the conceptual model are hypothesised to be moderated by attitude certainty, elaboration likelihood and message framing.

Section 2.4 reviews the health communications literature, concluding that following public service announcements, the cognitive response is not persuasive, with emotions taking a peripheral route to message effectiveness. This conclusion influences the clustering of individuals for tailored messaging.

Figure 2.1: Flowchart of the main findings of this literature review



2.1 Organisation-public relationships (OPRs)

Organisation-public relationship (OPR) research commenced with Ferguson's (1984) conference paper presented to the Association for Education in Journalism and Mass Communications Annual Convention, the influence of which led to a full reprint more than 30 years later in a leading public relations journal (Ferguson, 2018). Since the 1980s, OPR has become the second largest area of public relations research (Excellence Theory is the largest area) (Coombs and Holladay, 2015), and Ferguson (2018) became the most cited *Journal of Public Relations Research* article between 2018 and 2022 (Browning and Yang, 2022).

This review is structured as follows. First, there is an account of the development of OPR literature that identifies definitions of OPRs. Second, a section on antecedents of OPRs looks at how relationships are initiated, cultivated and improved. This second section emphasises the value of OPRs within public relations, which should target all stakeholders, not just those who have a problem with an organisation. A third section on measuring OPR dimensions finds that Hon and Grunig's (1999) dimensions are the most used in research studies, despite treating trust as one dimension, rather than breaking it down into cognitive and affective elements, a significant research gap. Finally, original contributions from reviews of OPR literature are critiqued to identify further research gaps. A conclusion summarises findings and lists eight research hypotheses.

2.1.1 Concepts and definitions

OPR theory has developed over nearly 40 years. Despite Ferguson's (1984) call to study public relationships and emerging theoretical underpinnings, it would be more than 14 years before Ledingham and Bruning's (1998) definition of OPRs. Another five would pass before Ledingham (2003) incorporated OPRs into a general theory of public relations.

Ferguson's (1984) analysis of the titles and abstracts of all 171 *Public Relations Review* articles published from 1975 to 1984 served as the catalyst for the study of OPRs. Of the 171 articles, only seven focused on public relations theory development. Having isolated three common topics in need of theory development – social responsibility and ethics, social issues and issues management, and public relationships - Ferguson (1984) promoted the study of public relationships. In addition to championing an area of theory, Ferguson (1984) sketched out new research directions by recommending the development of conceptual definitions and multi-dimensional attributes of public relationships. Suggested attributes included: the degrees to which relationships are open or closed, dynamic or static; relationship satisfaction; the amount of control both parties believe they have; how power is distributed; whether parties believe they have shared goals; and the mutuality of agreement and consensus. Ferguson (1984) recommended the focus be on relationships themselves, rather than organisations or publics.

When Grunig, Grunig and Ehling (1992) published their Excellence Theory, a 15-year study summarising communication management best practice, a list of potentially measurable OPR dimensions was included, in an attempt to develop practitioners' understanding of OPRs. The list of dimensions included: **reciprocity, trust, credibility, mutual legitimacy, openness, mutual satisfaction** and **mutual understanding**. However, no clear definition of OPRs was offered, nor was a method of OPR measurement outlined. The importance of OPRs within communications management best practice was being discussed in public relations literature, though: Grunig (1993:136) concluded that "symbolic (communications-based) relationships" should not be "divorced from behavioural relationships grounded in actions" otherwise public relations is reduced "to the simplistic notion of image-building".

Broom, Casey and Ritchey's (1997) extensive review of public relations, interpersonal communications, psychotherapy, inter-organisational relationships and systems theory literature found that some studies viewed relationships as a process observed over time, others saw them as a state at a single point in time, and some combined the two approaches. Some studies focused on subjective reality, others on objective reality, some had combined the two extremes. Although declining to offer their own definition of OPRs, inviting other researchers to develop one, Broom, Casey and Ritchey (1997) published a list of tentative conclusions and suggestions on OPRs (included in appendix 1).

In response to Broom, Casey and Ritchey's (1997) findings, Ledingham and Bruning (1998:62) concluded an early OPR study by contributing a tentative definition of OPRs: "…provides economic, social, political and/or cultural benefits to all parties involved, and is characterised by mutual positive regard".

Ledingham (2003) explicated relationship management as a general theory of public relations, contributing a definition that is still used today. Based on 14 axioms of OPRs (appendix 2) including that (1) organisation–public relationships are transactional and (2) relationships are dynamic; they change over time, the general theory of public relations stated that: "Effectively managing organisational-public relationships around common interests and shared goals, over time, results in mutual understanding and benefit for interacting organisations and publics" Ledingham (2003:190). Ledingham (2003) concluded that researchers must contribute more studies focusing on relationships and behavioural outcomes to further this general theory.

One of Ledingham's (2003:195) axioms states that "organisation–public relationships have antecedents and consequences and can be analysed in terms of relationship quality, maintenance strategies, relationship type, and actors in the relationship". Antecedents of OPR are the subject of section 2.1.2, while consequences are the subject of section 2.1.3, which looks at the dimensions of OPR. Researchers have not yet developed a method of measuring the concept of OPRs, as suggested by Ferguson (1984).

2.1.2 Antecedents of OPR

Although Excellence Theory (Grunig, Grunig and Ehling, 1992) attempted to explain relationship dimensions, the persuasive power of OPRs was not fully appreciated, nor the antecedents of OPRs properly understood, within its communications management best practice guidance. This was due to the ongoing influence of Grunig and Hunt's (1984) approach to external public relations, as explained in the following section.

2.1.2.1 Problems with Grunig and Hunt's (1984) approach

Certain aspects of Grunig and Hunt's (1984) approach facilitated relationship building, such as two-way communications and quality networking. However, it was not recognised that communications should be regular, not episodic, to maximise the persuasive power of OPRs (Johnston and Lane, 2018).

Drawing from systems theory, the study of groups of interrelated, interdependent components, Grunig and Hunt (1984) stated that organisations comprise six connected internal subsystems responsible for essential functions. The six subsystems were: management, public relations, production, disposal (such as distribution), adaptive (such as research and development), and maintenance (such as human resources). The public relations subsystem communicated between all the other subsystems as well as external stakeholders to share necessary information. A two-way symmetrical approach

was recommended so that organisations talk to stakeholders, and listen to stakeholders, in equal measure, rather than just issuing information and expecting stakeholders to read it and act on it.

However, Grunig and Hunt (1984) recommended communicating externally only when necessary for cognitive, attitudinal or behavioural effects with people who have a problem with the organisation. Such “publics” are defined as "a group of people who face a similar problem" due to "organisational consequences" (Grunig and Hunt, 1984: 143, 145). They can be split into categories: aware publics (aware of a problem but not yet acting on it), active publics (actively campaigning to resolve a problem) and latent publics (yet to understand that the problem exists) (Dewey, 1927; Blumer, 1946). This approach assumes two things: (1) public relations does not influence stakeholders’ emotionally, as may be required when dealing with angry customers, for example, and (2) no public relations communications are necessary with stakeholders who do not have a problem with an organisation, such as satisfied customers. Stakeholder relationship management could never be optimised by this approach, as underlined by a much-cited definition of public relations published one year later: “The management function that identifies, establishes and maintains mutually beneficial relationships between an organisation and the various publics on whom its success or its failure depends” (Cutlip, Center and Broom, 1985: 4). Aiming to retain satisfied customers is essential, as public relations should “change or neutralise hostile opinions, crystalise uninformed or latent opinion or conserve favourable opinions by reinforcing them” (Cutlip, Center and Broom, 1985: 152).

The prominence of Grunig and Hunt (1984) was such that studies continued to prioritise communications with publics who have a problem with an organisation. Grunig and Repper (1992) described a model of strategic public relations management containing a stakeholder stage, a public stage, and an issues stage. Within the stakeholder stage, “ongoing communication with these stakeholders helps to build a stable, long-term relationship that manages conflict that may occur in a relationship” so that stakeholders do not reach the publics stage (recognising a problem with an organisation, such as pollution levels) or the issues stage (acting to do something about the problem such as contacting the media) (Grunig and Repper 1992:124). Contradicting this within the same study, these stakeholders are said to be passive, having an unarticulated problem with an organisation, otherwise they are of no concern to an organisation (Grunig and Repper, 1992:125). Satisfied customers and others who do not have a problem with the organisation are ignored.

Indeed, relationship management seemed to be about the needs of the organisation. Grunig (1992:20) conceptualised public relations as “building relationships with publics that constrain or enhance the ability of the organisation to meet its mission”. The need for relationships was understood though, as it was seen as impossible to meet organisational missions through good relationships unless stakeholders are listening and acting (Grunig and Hunt, 1984). A better understanding of the value of OPR and its importance to public relations developed from Broom, Casey and Ritchey’s (1997) approach, the subject of the next section.

2.1.2.2 Broom, Casey and Ritchey's (1997) approach to value of OPR

Broom, Casey and Ritchey's (1997) review of public relations, interpersonal communications, psychotherapy, inter-organisational relationships and systems theory concluded that relationships exist through patterns of linkages and exchanges. There are antecedents of relationships (such as the need for resources from an organisation) and consequences (such as goal achievement) measurable separately from the relationships, which develop through mutual adaptation and contingent responses, as depicted in the model in figure 2.2. While Broom, Casey and Ritchey's (1997) antecedents initiated OPRs, they did not cultivate them, as seen in the following paragraphs.

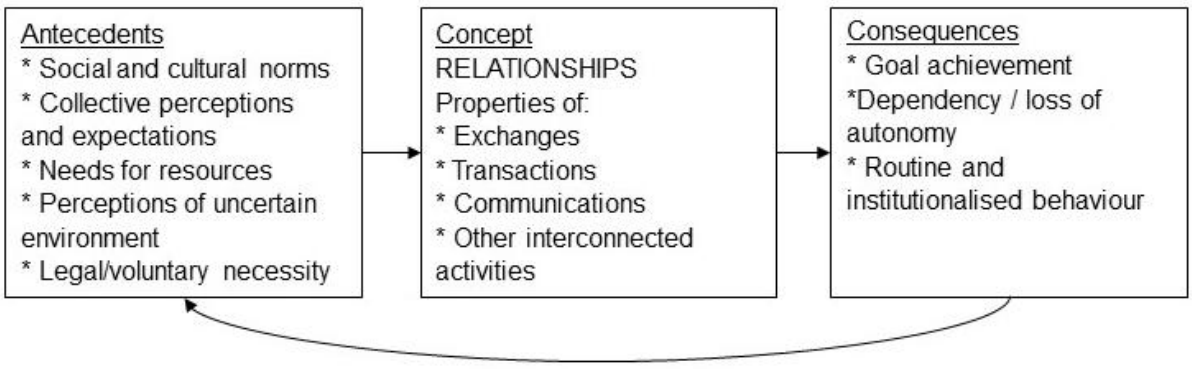


Figure 2.2: Antecedents, concept and consequences of relationships, from Broom, Casey and Ritchey (1997)

2.1.2.3 Relationship cultivation

Cultivation is essential if the effectiveness of public relations is to be maximised. Relationship cultivation strategies were contributed by Hon and Grunig (1999). Seeking to help practitioners maximise the long-term value of public relations, Hon and Grunig (1999) draw from research on interpersonal relationships and conflict resolution, research that became Grunig and Huang (2000) and Plowman (1998) respectively, to suggest a model containing several public relationship cultivation and relationship maintenance strategies for organisations to utilise. These strategies do not initiate relationships but help them to grow, akin to cultivating a plant with special soil. The strategies can be positioned between the antecedents and concept stages of Broom, Casey and Ritchey's (1997) model, as shown in figure 2.3, as once relationships have commenced they must be cultivated, or conflicts resolved, so that the relationships can grow and goals can be met as a positive consequence of the relationships. The outcomes of the strategies, such as openness, access, positivity, assurances, networking and sharing of tasks, are part of the concept of relationship within figure 2.3.

To give an example in the health sector, relationships with a local health organisation may be initiated due to a need for over 40s' health check-ups. They may be cultivated by assurances that the individual is doing the right thing getting checked. The goal is met when the check-up is booked, as a consequence of the blossoming relationship. Conflicts may also be resolved, such as meeting stakeholders to solve a misunderstanding for a win-win

solution (not just a win for the organisation), leading to health check-ups being booked.

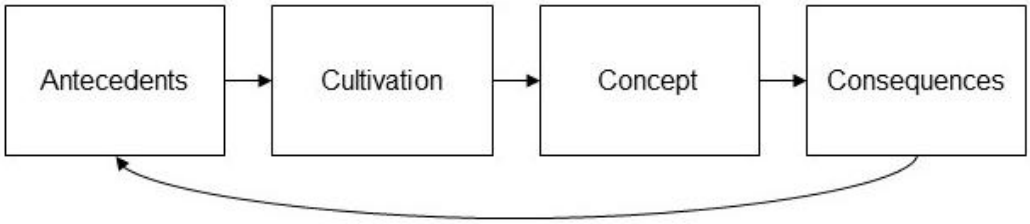


Figure 2.3: Positioning Hon and Grunig's (1999) relationship cultivation strategies between antecedents and concept

Many OPR studies have tested the linkages and exchanges illustrated in figure 2.3. Ki and Hon (2009) tested the relationship cultivation strategies of a grassroots organisation, finding that access, positivity, sharing tasks and assurances had a positive correlation with the quality of a relationship. Zhu and Han (2014) conducted a content analysis of relationship cultivation strategies used on tourism websites to develop a relationship cultivation scale that could be used in practice. Kang and Ki (2024) concluded that positivity, networking, and assurance were the most used strategies for organisations building relationships in 3D virtual worlds known as metaverses. Studies concluding that OPR outcomes influence consequences such as attitude, behaviour and advocacy include Ledingham and Bruning (1998); Bruning and Ledingham (1998); Bruning, Dials and Shirka (2008); Ki and Hon (2007a); Ki (2013) and Ma, Ma and Liu (2023).

Despite the fuller understanding of relationships, their antecedents and consequences and relationship cultivation, there was still the question of whether organisations should communicate with all stakeholders or just with publics who have a problem. It was not clear how to maximise the effect of cultivation strategies. These issues were resolved within dialogue literature. For example, Pearson (1989) concluded it was morally right to build good relationships with all publics so that competing agendas can be transformed by an understanding of shared goals, recognising that both one-way monologue and two-way dialogue are essential, the former creating understanding and awareness, the latter facilitating discussion. Kent and Taylor (1998) made an important comparison: that two-way symmetrical communication is a process, whereas dialogue is a product within which relationship, within the concept stage of Broom, Casey and Richey's (1997) model, exists. Maintaining good dialogue, the receptacle of relationship, is therefore an important part of relationship cultivation (Lane and Kent, 2018).

In summary to section 2.1.2, it is important and ethical to maintain good relationships with all stakeholders. To be able to cultivate good relationships with all stakeholders and publics and hence improve OPRs and maximise the effectiveness of public relations, organisations should be skilled at practising monologue and dialogue.

2.1.3 Development of OPR dimensions

Research on measuring the effects of OPRs (relationship consequences in Broom, Casey and Ritchey's (1997) model) took place in parallel with theoretical developments but divided scholars. Huang and Zhang's (2015) review of 40 OPR studies published between 2000 and 2011 in six major research journals found that OPR research could be divided into two main clusters.

- One cluster of five studies used derivatives of OPR dimensions originated by Ledingham and Bruning (1998) featuring the consequences **trust**, **openness**, **involvement**, **investment** and **commitment.**
- Another cluster of 13 studies used OPR dimensions developed by Hon and Grunig (1999) featuring the consequences **control mutuality**, **satisfaction**, **trust** and **commitment**.

In addition to these two clusters, Kim (2001) developed a list of OPR dimensions, featuring **trust**, **commitment**, **local or community involvement** (from the organisation) and **reputation**, while Sweetser and Kelleher (2016) tested a shorter instrument for measuring OPR dimensions.

These scales are investigated in the following sections.

2.1.3.1 Universality of trust and commitment

Although the main contributions to the development of OPR dimensions differed in terms of the dimensions included, they all featured the dimensions trust and commitment.

2.1.3.1.1 Trust

Despite the universality of trust, OPR researchers did not break it down into its component parts. Within sociology and business management literature, trust has been shown to include cognitive and affective elements (Lewis and Wiegert, 1985). **Ability** and **integrity** make up the cognitive elements while the affective dimension is described as **benevolence** and is based on the care and concern between parties (Mayer, Davis and Schoorman, 1995). The cognitive dimensions have a complicated relationship with the affective dimension of trust. While cognitive trust predicts affective trust, the latter potentially holds strong when cognitive trust has been betrayed (McAllister, 1995). While acknowledging separate cognitive elements of trust (**ability**, **integrity**, **dependence**) and including two questions to measure each of them within their OPR scale, Hon and Grunig (1999) do not include results on these separate elements but rather average out the elements for one overall trust measurement. The study does not measure affective trust at all, echoing Grunig and Hunt's (1984) thoughts to communicate externally only when necessary for cognitive, attitudinal or behavioural effects. None of the OPR studies based on the OPR dimensions listed above reports on the effect on cognitive attitude,

affective attitude or behaviour of the separate elements of trust or the linkages between these elements despite there being strong linkages between trust and attitude and behaviour (Jones, 1996; Bruning and Ledingham, 1998; Ledingham and Bruning, 1998; Ki, 2013; O'Neil, 2007). Nor do they report on the relationship between the OPR dimension control mutuality and the elements of cognitive trust despite there being a strong relationship between control mutuality and trust (Bortree, 2015). This is a significant research gap, perpetuated by researchers' tendency to draw from the same base measures for nearly 30 years. Hence the initial hypotheses for this PhD study investigate the following previously ignored relationships:

H1a Control mutuality positively influences capability

H1b Control mutuality positively influences dependability

H1c Control mutuality positively influences integrity

H2a Capability positively influences cognitive attitude

H2b Dependability positively influences cognitive attitude

H2c Integrity positively influences cognitive attitude

H3a Capability positively influences affective trust

H3b Dependability positively influences affective trust

H3c Integrity positively influences affective trust

H4a Affective trust positively influences affective attitude

H4b predicts that affective trust accounts for some of the variance in the construct affective attitude (discussed in more detail in section 2.3).

H4b R^2 for affective attitude is higher when affective trust is included as a dimension of OPR.

These elements are shown in figure 2.4, which forms the first section of the conceptual model of this research.

Hon and Grunig's (1999) OPR dimensions are used in this PhD research study as Hon and Grunig's (1999) OPR scale was found to be superior to Ledingham and Bruning's (1998), as explained in section 2.1.3.2.

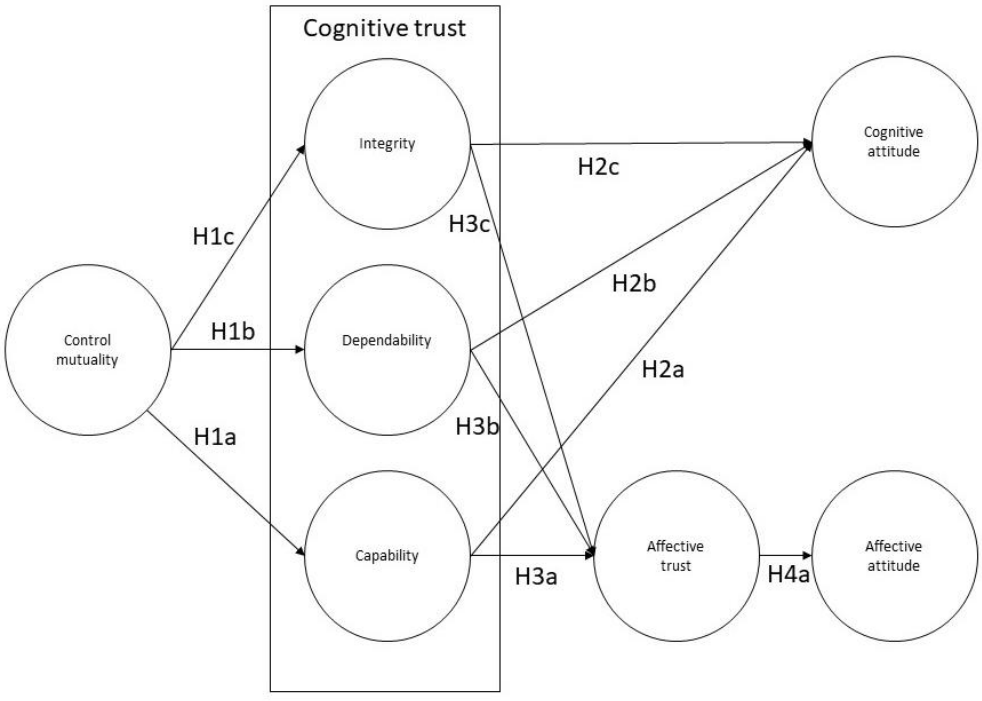


Figure 2.4: The relationship between the OPR dimensions used in this research study, based on Hon and Grunig (1999), Bortree (2015), Kim (2013), Jones (1996) and McAllister (1995)

2.1.3.1.2 Commitment

Commitment has three elements known as **continuance commitment, normative commitment** and **affective commitment** (Meyer and Allen, 1997). Continuance commitment relates to the cost of ending a relationship compared to the benefits of staying, affective commitment is an emotional orientation to a person or organisation, and normative commitment is a perceived obligation to remain in a relationship. To date OPR studies have not reported on the separate aspects of commitment, despite finding strong connections between commitment and attitude, and between commitment and behaviour (Bruning and Ledingham, 1998; Ledingham and Bruning, 1998; Ki, 2013; Bruning, Dials and Shirka, 2008; Bruning, Langenhop and Green, 2004). However, the commitment dimension is not included within this PhD research study, as explained below in section 2.1.3.3.

2.1.3.2 Problems of Ledingham and Bruning's (1998) dimensions

Although Ledingham and Bruning's (1998) study marked a turning point in testing the newly constructed OPR theory and its linkages to stakeholder behaviour, the dimensions used by this cluster ultimately made modelling OPRs difficult. This is because studies in this cluster combined dimensions representing the three stages of Broom, Casey and Richey's (1997) antecedents-concept-consequences model into one stage, as shown in the development of OPR dimensions in table 2.2 below. In the first instance, the researchers surveyed telephone company subscribers, at a time when the domestic telephone market was opening up to competition and consumers

were likely to move provider. Following a literature review of public relations, interpersonal relationships (Wood, 1995), marketing (Wilson, 1995) and social psychology (Trotter, 1986), Ledingham et al., (1997) compiled a list of 17 possible OPR elements (appendix 3). Ledingham and Bruning (1998) narrowed this down to the five most influential latent variables - **trust, openness, involvement, investment, commitment** - following qualitative interviews and focus groups with telephone subscribers. Once the survey was conducted, discriminant analysis was used to predict which customers would stay with or leave their current provider and which were undecided; 59 per cent of customers were classified correctly. **Trust**, **commitment** and **openness** were strongly related and **investment** and **involvement** were substantially related to a customer's decision to stay with their provider. Ledingham and Bruning (1998) admitted more research was needed to develop a full OPR model, to build upon the simple model of five dimensions linking to customer behaviour. Most of the resulting studies were overseen by Bruning himself, limiting the usefulness of the scale due its development in relative isolation.

Study	**OPR dimensions**
Ledingham and Bruning (1998)	trust openness involvement investment commitment
Bruning and Ledingham (1999)	professional relationship, personal relationship community relationship
Bruning and Galloway (2003)	anthropomorphism community involvement professional benefit/expectation personal commitment comparison of alternatives

Table 2.1: Development of OPR dimensions in the Bruning and Ledingham cluster

Antecedents to OPR were investigated in Bruning and Ledingham (1998). To test the relationship between OPR dimensions and customer attitudes, Bruning and Ledingham (1998) tested the extent to which the five OPR dimensions of **trust, openness, involvement, investment** and **commitment** affected customer satisfaction. A telephone survey was conducted with customers of a telephone provider. It was found that all five independent dimensions combined to explain 39% of variation in satisfaction. **Trust**, **commitment** and **involvement** significantly impacted customer satisfaction. A joint significance test confirmed that **openness** and **investment** should also be included when calculating the impact of OPR on satisfaction, suggesting these two variables could be antecedents of the other three serving as the result of the cultivation strategies suggested by Hon and Grunig (1999). One failing of the cross-sectional research was that it only included a single item to measure each of the five relationship variables, potentially limiting the research's reliability.

Significant contributions within this cluster continued, particularly when looking at how the strength of relationships changes over time. Following on from Ferguson's (1984) call to explore the dynamic nature of relationships, Ledingham, Bruning and Wilson's (1999) literature review of organisation-public relationships, interpersonal relationships (Wood, 1996) and social exchange theory (Thibaut and Kelley, 1959) encompassed findings by Wilson (2000), Knapp and Vengelisti (1996) and Canary and Stafford (1994), concluding that the influence of time in the relationship had yet to be tested empirically. Using the five relationship elements from Ledingham and Bruning (1998), Ledingham, Bruning and Wilson (1999) conducted quantitative, yet

cross-sectional, research of telecommunications consumers' perceptions and behavioural disposition: the data comprised 404 completed 57-item surveys. Multivariate analysis of variance (MANOVA) revealed that the scores for the OPR dimensions tended to decline when the length of relationship with the company reached four years. All five OPR elements had a significant relationship with time. Later in the relationship, scores improved and reached new highs as time went by, particularly by year 15, except for trust, which returned to the initial level. There thus appeared to be a non-linear relationship between OPR dimensions and time. Ledingham, Bruning and Wilson (1999) concluded that a willingness to leave the relationship decreased over time and advised that tailored relationship-building strategies should be implemented to meet the differing needs of publics, depending on the length of time the relationship has been in place. The researchers called for further studies to develop OPR research, particularly as the results of surveys of telecommunications consumers could not be generalised.

Despite this progress, an early attempt to bring the two emerging research clusters together actually pushed them further apart by submerging the importance of trust and commitment, despite their use in other areas of literature. Bruning and Ledingham (1999) developed a model of relationship management, testing a combination of eight of the relationship elements of Bruning and Ledingham (1998) and Grunig, Grunig and Ehling (1992): the elements were **trust, openness, involvement, investment, commitment, reciprocity, mutual legitimacy, mutual understanding.** Results of a survey of bank customers of student age concluded that the OPR survey questions

could be regrouped within three dimensions: **professional relationship**, **personal relationship** and **community relationship** - with each dimension calling for customised PR programmes and messaging. These three dimensions diverted attention away from the dimensions associated with OPR outcomes – such as trust and commitment - and their linkages with attitude and behaviour. Bruning and Ledingham (1999) themselves did not report on the effect of these OPR dimensions on customer satisfaction. Despite this, the researchers encouraged practitioners to use their scale in PR programmes designed around relationship goals.

The move away from Broom, Casey and Richey's (1997) antecedents-concept-consequences model continued. Striving to test OPR theory in a range of sectors, Bruning and Galloway (2003) further developed the multi-dimension scale by focusing on a well-established US electricity provider, conducting a telephone survey using the scale of Bruning and Ledingham (1999) along with additional questions. The researchers concluded that the multi-dimensional aspect of OPRs should be expanded from three to at least five dimensions thereby consisting of: **anthropomorphism** (organisation demonstrating positive human benefits), **community improvement** (by the organisation), **professional benefit/expectations** (of the organisation), **personal commitment** (to the organisation), and **comparison of alternatives**. Bruning and Galloway (2003) concluded that public relations practitioners should focus on calculating the different levels these relationship dimensions may take for each stakeholder group before deciding on the most appropriate communications strategy for these stakeholders.

The development of dimensions continued. Linkages to attitude and behaviour were tested in another context when Bruning, Langenhop and Green (2004) examined city-resident relationships finding the five dimensions of the Bruning and Galloway (2003) scale to be powerful influencers of residents' positive attitudes toward a local authority's services and intensions to continue living in the area. It was found that that **anthropomorphism** and **community improvement** were strongly related to respondents' evaluation of life in the city; **personal commitment**, **comparison of alternatives**, positive evaluations of city services and housing satisfaction were substantially related, and **professional benefit/expectations** was moderately related to residents' attitudes.

A synthesis of OPR theory and dialogue theory generated interesting results but treated all the dimensions as direct predictors of attitude. Bruning, Dials and Shirka (2008) tested the five dimensions of the Bruning and Galloway (2003) scale along with three of the dialogic elements of Kent and Taylor (2002): empathy, propinquity and mutuality. The researchers surveyed customers of a US water company to investigate whether the eight factors influenced customers' perception of relational benefit to the extent of affecting behavioural intent to support a new tax levy. The results revealed a significant relationship between perceptions of relational benefit and support of a tax levy. **Personal commitment**, **empathy**, **mutuality**, **professional benefit**, and **comparison of alternatives** related substantially while **propinquity**, **anthropomorphism** and **community improvement** related moderately to the discriminant function. As the effect of these five dimensions differed compared to results from

Bruning, Langenhop and Green (2004), the inability to see how a relationship consequence such as trust is driving these differences is particularly frustrating. If levels of trust are low, the dimension could, for example, be targeted in a campaign to improve advocacy and attitudes, via the boosting of elements such as personal commitment and comparison of alternatives. It is, in addition, not clear from the results whether the dialogic elements are antecedents of the relationship dimensions.

The role of trust is missing from one study not overseen by Bruning and/or Ledingham. Banning and Schoen (2007) used the Bruning and Ledingham (1999) scale to explore members' behavioural intention to extend museum membership, via a postal survey. Participants recording high scores for all three dimensions - **professional relationship**, **personal relationship**, **community relationship** - tended to rate their relationship with the museum as being long-term. How trust influenced these scores is unknown.

In summary of section 2.1.3.2, while successfully demonstrating the effect of OPR, studies in the Ledingham and Bruning (1998) cluster concertina together three of the stages illustrated in figure 2.3 (cultivation, concept and relationship consequences), making it incompatible with Broom Casey and Richey's model (Ki and Hon, 2007a). The dimensions are incompatible with the cultivation variables identified by Hon and Grunig (1999) and confuse the role of the dialogic elements introduced by Kent and Taylor (2002). This makes developing and populating Broom, Casey Richey's (1997) model, and

synthesising an OPR model with other theories using the dimensions trust and commitment, more difficult**.** For example, when considering the role of emotions, trust can be influenced by gratitude, happiness and anger (Dunn and Schweitzer, 2005). Hon and Grunig's (1999) scale has, therefore, become the dominant measure of OPR dimensions.

2.1.3.3 Superiority of Hon and Grunig (1999) dimensions

Hon and Grunig's (1999) OPR scale encouraged an OPR research cluster that has continued to measure the same four dimensions of relationship consequences. Referring to an exhaustive literature review in what became Grunig and Huang (2000), Hon and Grunig (1999) compiled a questionnaire testing for the presence of four relationship outcomes: **control mutuality, trust** (comprising integrity, dependability, competence)**, satisfaction** and **commitment** (comprising continuance and affective commitment). These outcomes had previously been defined in Huang (1997). All four dimensions are defined in table 2.2**.** The questionnaire also tested for two measures of relationship type: **communal relationships, exchange relationships** (also defined in table 2.2).

Relationship outcome	Description
Control mutuality	Power one party has over the other
Trust	Integrity, dependability, competence
Satisfaction	Benefits of OPR outweigh costs
Commitment	Worth spending energy to maintain
Exchange relationship	Giving benefits as other party has given benefits in past
Communal relationship	Both parties concerned for welfare of the other

Table 2.2: Relationship outcomes from Hon and Grunig (1999)

To improve reliability in response to Bruning and Ledingham's (1998) survey, Hon and Grunig (1999) reported research that consisted of up to nine questions per dimension. The survey was sent to random email addresses belonging to customers of five organisations in different sectors: Microsoft, General Electric, National Rifle Association, American Red Cross, and representing the public sector the Social Security Administration. The relationship indicators were deemed reliable enough as a scale measuring OPR dimensions. The Red Cross scored the mostly highly on the four OPR dimensions, and enjoyed strong communal relationships, whereas the National Rifle Association scored the most poorly and experienced exchange relationships. Hon and Grunig (1999) encouraged practitioners to start using the PR Relationship Measurement Scale for the measurement of relationship consequences immediately. Hon and Grunig (1999) also suggested additional research could examine relationships from an organisation's perspective, and echoed Ferguson's (1984) call that relationships should also be measured independent of organisations' or publics' perceptions. This would involve measuring relationships at the concept stage of Broom, Casey and Richey's (1997) relationship model, instead of measuring OPR dimensions at the consequence stage.

Despite furthering OPR understanding, Hon and Grunig (1999) made no attempt to build on Bruning and Ledingham's (1998) work to link relationship outcomes to organisational objectives, such as attitude or behaviour. Encouraged to continue testing the indicators in various contexts, researchers began contributing to this cluster frequently. Huang (2001) recommended that

practitioners measure OPR dimensions using these dimensions regularly to see whether OPRs are improving in response to communications activity.

This cluster valued measuring dimensions at the consequences stage only. By the time Ki and Hon (2007a) tested the linkages between OPR elements and attitude and behavioural intentions, the researchers had several sets of OPR dimensions to choose from. Ki and Hon (2007a) opted for a shortened version of Hon and Grunig's (1999) guidelines for measuring OPR to study the relationship between a US university and its students believing "this model makes a clearer and more accurate distinction between measuring relationship maintenance strategies and measuring relationship outcomes or indicators of a positive relationship" and asserting that "measures such as openness, investment and community improvement are better understood as relationship maintenance strategies" (Ki and Hon, 2007a:4). Satisfaction and control mutuality were found to have direct statistically significant effects on attitude, and indirect effects (via attitude) on behavioural intention. There was also acknowledgement that some OPR dimensions could be antecedents to others, which could explain why some dimensions did not have a measurable effect on attitude or behaviour intention within this research.

The time was then opportune to investigate the relationship between OPR dimensions. Ki and Hon (2007b) used a version of Hon and Grunig's (1999) dimensions to test the linkages between the OPR elements satisfaction, trust and commitment, examining the relationship between the State Farm Bureau

and its members, and theorising from marketing and business-to-business literature that relationship satisfaction influences trust, which influences commitment. It was revealed that satisfaction was a significant predictor of trust, and trust significantly affected commitment. Partial correlation also showed a significant but weak link between satisfaction and commitment. Control mutuality was measured but linkages between control mutuality and other OPR dimensions were not tested. However, despite these results there was no inter-study explanation as to why only satisfaction and control mutuality might link to attitude in Ki and Hon (2007a) when they predict trust and commitment in Ki and Hon (2007b).

A model combining the four OPR dimensions was later developed. Bortree (2015) summarised the relationship between Hon and Grunig's (1999) OPR elements with reference to previous studies: control mutuality predicts trust, satisfaction and commitment (Bortree, 2010); satisfaction is a strong predictor of trust (Ki and Hon, 2007b), which influences commitment (Morgan and Hunt, 1994; Ki and Hon, 2007b).

The collective findings of Bortree (2015) and Ki and Hon (2007b) are illustrated in Figure 2.5 on the following page.

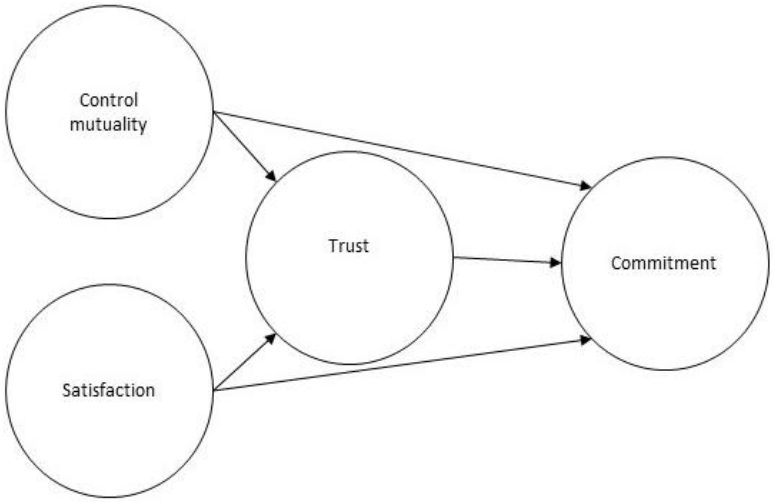


Figure 2.5: Relationships between Hon and Grunig's (1999) four OPR dimensions, taken from Bortree (2015) and Ki and Hon (2007b)

Other studies included in Huang and Zhang's (2015) review tested Hon and Grunig's (1999) dimensions in various contexts, though not for the promotion of physical exercise. Ki (2013) explored how OPR affected attitudes to five US banks. Ki's (2013) study used a scale devised by Zeithaml, Berry and Parasuraman (1996) to measure customers' behavioural intentions; attitude was measured via four additional questions. Potential linkages among relationship perception, attitude and behavioural intentions were tested. Ki's (2013) hypotheses were strongly supported, with 71% of overall variance in attitude explained by the four OPR dimensions, accompanied by a very strong link between attitude and behavioural intentions. Using Hon and Grunig's (1999) scale and conducting ANOVA analysis, O'Neil (2007) found a significant relationship between all four OPR dimensions and donations to a US charity in terms of happiness to continue donating.

Kang and Yang (2010) used Hon and Grunig's (1999) scale to test whether OPR beliefs mediate between an awareness of OPR communications and behavioral intentions, an incarnation of the Belief Formation Hypotheses (Fishbein and Ajzen, 1975). After surveying donors of a US not-for-profit organisation via the Internet and post, Kang and Yang (2010:490) concluded that "public relations practice can become ineffective if the practice is missing the significant role of OPR outcomes".

Many other studies not catalogued by Huang and Zhang's (2015) review have used Hon and Grunig's (1999) elements to test and extend OPR theory. Saffer, Sommerfeldt and Taylor (2013) demonstrated the relationship-building power of digital channels by finding a significant relationship between Twitter interactivity (measured as the number of replies an account has with its followers) and relationship quality for all four OPR dimensions for the organisations Starbucks, Gatorade and Target. Lee and Rim (2016) discovered that OPR mediated between the negative spillover effects of a crisis originating from a different organisation and customer attitudes. Pressgrove and McKeever (2016) found significant linkages between OPR dimensions and stakeholder loyalty to non-profits.

However, Wang, Ni and De la Flor (2014) found that control mutuality and trust were the most critical factors to relationship development. Control mutuality is critical as the foundation of healthy symmetrical communications. It invites stakeholders to contribute to a relationship and encourages a sense of shared

decision-making. Trust is critical as the connection built with stakeholders through control mutuality leads to a trusting bond, encouraging advocacy or attitude change. The dimensions satisfaction and commitment may not significantly influence advocacy or attitudes, though. The absence of an alternative provider organisation (for example, for health services) may diminish the influence of the OPR elements continuance commitment and affective commitment on attitude and behaviour. The level of interdependence in the relationship may affect levels of relationship satisfaction without those levels of satisfaction influencing attitudes or behaviour. Ni et al. (2019) use the same two OPR dimensions, control mutuality and trust, in their examination of public communication behaviours when communicating on cancer prevention. Interestingly, Kim (2015:457) uses only the OPR dimension trust when examining government–public relationship-building, calling it a “cornerstone of OPR“. Sisson (2017) focused only on the effect of OPR dimension control mutuality on social media engagement. Following the lead of Wang, Ni and De la Flor (2014) and Ni et al. (2019), this PhD research study analyses the effects of trust and control mutuality, not all four OPR dimensions.

In summary of section 2.1.3.3, Hon and Grunig’s (1999) dimensions have emerged as the leading OPR dimensions within public relations literature, Ki and Hon (2007a) recognising the scale’s compatibility with Broom, Casey and Ritchey’s (1997) relationship model, and Ki and Hon (2007b) and others successfully identifying the linkages between OPR dimensions within the outcomes stage of that model. However, It is not unusual for OPR dimensions to be omitted from Hon and Grunig’s (1999) scale.

2.1.3.4 Shortcomings of other approaches

Other approaches to measuring OPR dimensions are inferior to Hon and Grunig (1999). Kim's (2001) OPR dimensions do not model reputation adequately, while Sweetser and Kelleher's (2016) OPR scale underestimates OPRs by focusing on aspects of relationship cultivation and dialogue rather than relationship outcomes. Both scales are examined below.

Following a literature review of public relations, interpersonal relationships and marketing management, Kim (2001) compiled a questionnaire to survey US university graduates, arriving at an alternative 16-item scale measuring four OPR dimensions: **trust**, **commitment**, **local or community involvement** (from the organisation) and **reputation**. These dimensions also prove problematic when attempting to populate Broom, Casey and Richey's (1997) relationship model due to community involvement representing a maintenance strategy not a dimension of relationship (Ki and Hon, 2007a). Given the library of literature on corporate reputation, it is also possible to evaluate Kim's (2001) dimensions with respect to reputation theory. Ingenhoff and Buhmann (2016) concluded that **cognitive** (competence, values) and **affective** (emotional attractiveness) reputational components are antecedents of trust, which feeds a recommendation intention. Although Kim (2001) recognises that there are cognitive and affective elements of reputation and relationship, the four indicators measuring reputation fail to capture its affective side, making the dimension inferior to that modelled by Ingenhoff and Buhmann (2016). Further identifying Kim's (2001) model as too simplistic, Yang and Cha (2015) later

concluded that experiential relationships and primary reputation are causally reciprocal (have effects on one another), whereas reputational relationships and secondary reputation (both heuristically based) are non-recursive (do not affect one another).

Following a review of 12 OPR studies published between 1999 and 2015, Sweetser and Kelleher (2016) narrowed down 25 OPR measurement items to 11, intended as a shortcut to measuring OPRs by focusing on the measurement of cultivation strategies. Alumni of a university were contacted by email and contributed over three months to an online survey. Two dimensions (communicated commitment and conversational voice) explained 23% of variance in general attitudes towards the university and 24.4% of variance in perceptions of the university's social responsibility. These percentages are lower than those obtained by Ki (2013) and Banning and Schoen (2007), suggesting the two dimensions and their parent scale do not succeed in explaining the total effect of OPRs, probably because the dimensions relate more to dimensions of relationship cultivation and dialogue. Communicated commitment has similarities to Kent and Taylor's (2002) dialogue dimension propinquity for example. Ultimately, it is important to separate out the measurement of OPRs so that cultivation strategies can be compared, making the Sweetser and Kelleher (2016) scale inferior to that of Hon and Grunig (1999). Interestingly, Men et al. (2023) use conversational human voice as a predictor of OPR when evaluating the relationship-building abilities of corporate chatbots, affirming its status as an antecedent.

Having looked at OPR definitions and scales, the next section now briefly examines key reviews of the OPR literature.

2.1.4 Reviews of OPR research

More than 20 years after Ferguson's (1984) conference paper, scholars began to sum up what had been achieved to date within OPR research, suggesting future directions to fill research gaps.

Ki and Shin's (2006) review provided interesting future directions for OPR research. The summary of 38 contributions to ORP research, from 1985 to 2004, concluded that researchers must steer towards agreement on definitions for words such as 'elements' and 'indicators' and should look at the nature, dimensions and boundaries of relationships as a dynamic process, looking from more recent developments in social psychology, intra-organisation research, marketing and conflict management literature. A leaning towards Hon and Grunig's OPR dimensions in subsequent years has provided more agreement among researchers.

Huang and Zhang's (2015) review of 40 OPR studies underlined a significant research gap: the "need to explore a theoretical and methodological model for measuring OPR's hidden effects" such as "cost reduction" by examining "the interactions of variables at individual and organisational levels" (Huang and Zhang, 2015:21). This unwittingly underlines the need to study the effect of

affective trust, previously unquantified, via a framework of variables within SEM, to properly calculate OPR's cost-reducing powers.

Coombs and Holladay (2015) questioned the ethics of applying concepts from interpersonal relationships to public relations due to the power organisations have to use the bond to meet strategic goals. The researchers worried that strong OPRs could potentially trap people in one relationship when another might be more beneficial overall. These concerns would not be warranted within the public sector as organisations such as local councils and NHS trusts aim to work in the public's best interests (Central Bedfordshire Council, 2024) and there is often no alternative provider for public services.

Critically analysing 158 OPR studies from 1998 to 2016 in 12 key journals, Cheng (2018) isolated five main OPR research gaps. As well as describing OPRs as too idealised with no recognition of conflict situations, there was a request for OPRs to be rechristened organisation-others relationships, echoing Heath's (2013) call for a multi-party model, and Hon and Grunig's (1999) consideration of conflict strategies. Cheng (2018) also pointed out that most OPR studies are cross-sectional relying on publics' self-reported data, suggesting content analysis and social network analysis, as proposed by Yang and Taylor (2015), to examine a relationship or networks of relationships more objectively from both sides longitudinally. This would finally focus on the concept aspect of relationships in Broom, Casey and Richey's (1997) model in figure 2.2. Trust is labelled as 'problematic', Cheng (2018) concluding that the

element should be tailored to each OPR situation (internal, external, inter-organisational) with the recognition of distrust as a separate construct. As a solution, Cheng (2018) proposes a synthesis of contingency theory of conflict management and relationship management theory as Contingent OPR (COPR) with a continuum of six relationship modes: **competing**, **evading**, **capitulating**, **neutral**, **accommodating**, **cooperating**. Without further research it is tempting to hypothesise that this continuum is already represented within the numerical 1-to-9 results of Hon and Grunig's (1999) OPR scale, with 1 and 2 perhaps representing competing and 8 and 9 representing cooperating, although complementary content analysis would certainly deliver fascinating qualitative results. Atwell Seate et al. (2022) have, interestingly, conducted an ethnographic study focusing on multi-party relationships in crisis weather forecasting, concluding that tensions within networks can be diffused by effective multi-party relationship building. Multi-party relationship management following a social networking perspective is not of interest for this PhD research study, though, as this study tests the influence of the relationship between a regional integrated healthcare partnership and the general public, not the relationships and tensions between the various organisations in that healthcare partnership. It could be of interest in future research focusing on how to maximise the strength of OPRs via effective networks. However, Zhao et al.'s (2024) attempt to define COPR relationships objectively found no causality between the six relationship modes (derived from combinations of public and corporate stances, themselves defined by the results of the content analysis of social media and article content) and stock prices, diminishing somewhat the importance of Cheng's (2018) research gaps.

These reviews of OPR literature can themselves be criticised. None of the reviews recognises three important research gaps. The studies do not test the effect of OPR for different stakeholder groups, or the effect of OPR for stakeholder groups receiving differently framed marketing communications messages. They generally measure the effect of existing levels of OPR on existing levels of attitude and/or behaviour. This makes it difficult to assess the relative value of OPR compared to other variables in a model of persuasion, such as emotions or belief (Petty and Cacioppo, 1986), given that a message must be delivered to undermine the status quo and inspire change via the resulting changing value of variables in a framework. Nor do they directly suggest dividing the OPR element trust into its cognitive and affective elements, to calculate the size of the effects of these elements following a message.

The reviews do not highlight that the OPR studies only focus on situations where the organisation in question provides the activity to which attitudes are measured. However, while a health service recommends physical exercise, it is up to individuals to perform it. The strength of relationship with the health service may act as a persuasive force though. It has been more typical for studies to focus on the relationship with banks, local government (focusing on attitudes to all services or just one service such as the water department or parks), universities or telecommunication providers, and attitudes towards the services they do provide. This is an important research gap.

The findings from this review of OPR literature are now summarised.

2.1.5 Conclusion

OPR research has made some significant findings over nearly 40 years. Extant studies have shown OPRs to directly or indirectly influence attitude, behavioural intention and behaviour in a number of areas.

However, despite the popularity of OPR research, there is not a clear understanding of the effect of individual OPR dimensions on attitude, particularly as researchers have not investigated the effect of the individual cognitive and affective elements of trust and commitment. Indeed, the relationships between control mutuality and the individual elements of cognitive trust have not been tested. In addition, the relationships between the cognitive elements of trust and affective trust have not been tested within public relations literature. Most importantly, the effect of affective trust on affective attitude has not been tested.

Given that OPR studies have so far not analysed the effect of the individual elements of trust, it is likely that the effect of OPR on attitude and behaviour has been under-estimated. This may have led to the underestimation of OPR's hidden benefits such as cost reduction for organisations.

Due to the shortcomings of other sets of dimensions, Hon and Grunig's (1999) dimensions have become the most popular within OPR research (Browning and Yang, 2022). They have been proven to have reliability and validity when

measuring OPR, and the dimensions trust and commitment are easier to synthesise with other studies and models to create that can be used in practice. For example, it is easier to model cultivation strategies and dialogue as antecedents of OPR dimensions (which are relationship consequences) within Broom, Casey and Richey's (1997) relationship model. Hon and Grunig's (1999) dimensions are preferred by OPR researchers, Ki and Hon (2007b:421) underlining that "a growing body of empirical data has shored up this assertion". The dimensions continue to be tested in a range of contexts. However, a number of studies use two OPR dimensions - control mutuality and trust - as the most crucial factors to relationship development. Following this lead, the OPR dimensions used within this PhD research study are control mutuality and trust.

No studies have focused on the role of OPRs where the organisation in question is not the provider of the activity to which attitudes are measured. Nor have studies focused on the relative effect of OPRs for differing stakeholder groups, or for stakeholders receiving different message frames.

As Ki and Shin (2006) call for OPR theory to be advanced by developments in social psychology and marketing, the second review of literature focuses on social marketing, the third review examines persuasion models that could be synthesised with OPR theory, while the fourth directly examines findings within the area of health communications.

2.2 Social marketing

Originally suggested by Wiebe (1951) who asked, “Can we sell brotherhood and rationale thinking like soap?” and developed by a number of major contributors, such as Kotler and Zaltman (1971) and Morgan and Hunt (1994), social marketing seeks to positively influence social behaviours, such as those relating to health and sustainability, by adapting principles originally developed within psychology, anthropology, sociology and corporate marketing, such as McCarthy’s (1960) four Ps marketing mix: price, place, product, promotion (Duane, 2012; Hastings and Domegan, 2014).

Definitions of social marketing emphasise intended benefits to society. Lee and Kotler (2011:26) offer the following definition: “A process that applies marketing principles and techniques to create, communicate and deliver value in order to influence target audience behaviours that benefit society (public health, safety, the environment, and communities) as well as the target audience.” In contrast, the Chartered Institute of Marketing’s definition of marketing, published in 1976, says that marketing is “the management process responsible for identifying, anticipating and satisfying customer requirements profitably” (CIM, 2007). Hastings and Domegan (2014:14) see social marketing as a necessary antidote to the negative impact of relentless marketing-led consumption on public health and business sustainability, explaining that social marketing “examines commercial marketing so as to learn from its successes and curb its excesses”.

2.2.1 Key principles

Gordon et al. (2006) argue that there are four key principles of social marketing:

- voluntary behaviour change
- exchange
- marketing techniques
- end goals

Together these key principles together make up social marketing on a macro scale. They are now critically examined individually.

2.2.1.1 Voluntary behaviour change is fuelled by attitude

Hastings and Domegan (2014) emphasise that the underlying objective of social marketing is voluntary behaviour change, such as recycling to slow down climate change or smoking cessation, not just the promotion of such change. Instead of encouraging the continuation of the current behaviour, as a corporate entity would by continuing to market cigarettes to an individual, a social marketer would look to inspire long-term voluntary behaviour change. This generally means disturbing the balance of contributing, and often contradictory, affective attitudes (based on emotions) and cognitive attitudes (based on thought) to arrive at a new equilibrium and potentially a new behaviour, a process made possible within social marketing by the concept of social exchange. This second key principle is investigated in the next section.

2.2.1.2 Social exchange influences communications messaging

Social exchange theory posits that individuals award value to alternative behaviours (such as watching television instead of exercising) and then select the behaviour that offers the greatest perceived benefit to them (Hastings and Domegan, 2014). Homans (1961) found that people also weigh up the rewards and risks of relationships, ending a relationship when the risks outweigh the rewards. Lefebvre (1992) underlines that the final outcome of exchange should be a win-win between the parties involved.

Within social marketing the value associated with a particular behaviour ideally has to be co-created between the organisation conducting the social marketing project and the 'client', or stakeholder, in question. For public health, the 'client' is a section of the public living in a particular area served by a health authority (Lefebrve, 2012; Domegan et al., 2013; Hastings and Domegan, 2014). An exchange is essential to all social marketing yet could be something intangible and symbolic – such as not getting cancer or avoiding accidents – prompting social marketing theorists to analyse how they can be constructed.

Bagozzi (1975) had already underlined that exchanges within social marketing are not as straight forward as selling a simple good or service in the commercial sector, as they typically involve unseen benefits. Hastings and Domegan (2014) however point out that commercial marketing departments are also often selling ambiguous qualities such as restaurant ambience, emotional benefits or brand

values such as wearing a fashionable label; hence social marketers are able to use commercial marketing techniques in the pursuit of social benefits. By compromising in their communications messaging, social marketers cease to rely solely on key facts, such as medical facts and figures in anti-smoking campaigns, to make a new offering, based less on hard facts and more on other aspects of the value of a behaviour, such as a happier life. Social marketers must decide whether messaging to promote this new offering should be framed cognitively or affectively framed, and valenced positively or negatively for maximum impact. Interestingly, behavioural economics literature has also seen a shift from the provision of goods to the supply of intangibles, specialised skills and knowledge processes (Vargo and Lusch, 2016).

Indeed, compromising on the cognitive aspects of messaging could see an individual being tempted by the more instant benefits of behaviour change, this reframing often tailored to influence affective attitude and behaviour. Putting it another way, the pleasurable benefits of ceasing a risky behaviour such as smoking (for example, joining a non-smoking social group) are promoted having arrived jointly at this co-created solution with smokers via research, instead of the risks associated with continuing or the long-term benefits of stopping such as better health in later life. A similar compromise is possible when the pleasurable benefits of a healthy behaviour choice such as regular exercise are promoted (such as a running social group), instead of focusing on the dangers associated with not making that choice (such as the greater risk of a heart attack). In terms of negative affective message-framing, fear messaging could be persuasive too although its effectiveness depends on the level of fear

induced, the probability of the situation described happening and the self-belief of an individual to make an effective response (Rogers, 1965). Compromising on messaging could also be purely cognitive, such as when messages promoting saving the planet via recycling become news of a free council-organised Christmas tree collection service which saves householders the trouble of taking their tree to a recycling centre.

The concept of social exchange challenges Petty and Cacioppo's (1986) and Chaiken's (1980) view that an attitude based on cognition, formed by taking a central/systematic route within the ELM and the Heuristic Systematic Model (HSM), is more permanent in nature than an attitude based on affective attitude based on emotions. The ELM will be discussed in detail in section 2.3.

Whether to express the value of a behaviour through affective or cognitive message frame is a decision within the micro elements of social marketing that combine to make up the macro, a full campaign. Interestingly, many behaviours can be influenced by both cognitive and affective attitude as well as by self-efficacy (the perceived ability to perform a behaviour) and subjective norm (the motivation to comply with the actions of others) as predicted in the RAA (Fishbein and Ajzen, 2010).

When attempting to induce voluntary behaviour change, via a message compromise based on a broader view of the value of a behaviour, it is important to recognise the importance of competitive analysis, as discussed next.

2.2.1.2.1 Competitive analysis assesses alternative behaviours

When individuals make a behavioural decision, they are not just weighing up the pros and cons of an organisation's offering, they are likely to be considering alternative offerings (Hastings and Domegan, 2014). It is important for a social marketer to understand its competitors' offerings to ensure competitiveness when communicating the value of a behaviour. This competitive analysis must identify why alternatives are accepted or rejected and analyse how NGOs and government agencies, religious organisations and competing social marketing providers affect individuals' decision-making.

Noble and Basil (2011) list four levels of competition:

- generic level (when social marketers are competing with other concerns for the public's attention, for example a natural disaster)
- enterprise level (when alternative solutions exist such as a weight loss programme)
- product level (when there are direct alternatives to an offering from a competitor pushing in the other direction, for example cola promoted via powerful Christmas adverts)
- brand level (head-to-head competition from organisations who want the social marketer's business, such as an alternative exercise campaign).

Clearly a social marketer must have a very attractive offering to turn a smoker away from smoking instead of to vaping or to tempt a lifelong drinker to start running 5km regularly, and the social marketer must be able to communicate this offering in terms of the overall value of the behaviour effectively via the right message frame to prompt the desired voluntary behaviour change.

Relationships with stakeholders could be a powerful competitive force for two reasons. Firstly, Hastings and Domegan (2014) talk of the additional competitiveness that comes from collaboration, underlining the importance of relationship-building. This can have a negative effect on a social marketer's brand, though, if, for example, the social marketer teams up with a cola brand to promote sports, and this collaboration leads to some seeing the social marketer as a promoter of unhealthy products.

Secondly, strong levels of OPRs could prevent an individual from terminating a relationship with an organisation. Interestingly, the OPR dimension satisfaction measures how the benefits of a relationship outweigh the costs (Hon and Grunig, 1999). Strong levels of the OPR dimension trust could also boost competitiveness. Indeed, competitive analysis literature does not adequately allow for the persuasive power of OPRs. Although Homans (1961) found that individuals base continuing a relationship on the relative magnitude of rewards and risks, this does not fully account for situations where the OPRs themselves are valued to the extent that it leads to voluntary behaviour change, even when the risks would otherwise outweigh the rewards.

OPR has a value beyond its contribution to customer retention, as it can help win customers, too. Yang and Cha (2015) point out that there are relatively weaker reputational relationships (for example, when an individual simply knows of a campaigning healthcare charity and its opinions but is not a service user) and relatively stronger experiential relationships (for example, when the individual has become a service user and joined the charity's support group). A healthy reputational relationship, when cultivated, may eventually lead to a strong experiential relationship, as the literature review on OPR has shown (Ledingham and Bruning 1998; Ki, 2013).

Competing alternatives could also be seen as what Fishbein and Ajzen (2010) would label a background factor in the RAA, although they could be modelled as a direct predictor of behaviour (Venkatesh, Davis and Zhu, 2023). Either way they cannot be controlled by the social marketer, which must strengthen relationships with stakeholders through its mastering of marketing techniques, the third of Gordon et al.'s (2006) key principles, the subject of section 2.2.1.3.

In summary of section 2.2.1.2, communications are essential for a social exchange with the co-created story comprising persuasive cognitive or affective message frames focusing on the wider value of a behaviour. Alongside a persuasive message frame, strong levels of OPRs would lead to additional competitiveness, tempting individuals away from alternatives.

2.2.1.3 Marketing techniques

Although practical tools have been suggested for use within social marketing in an attempt to tackle the ills of over-consumption, they are rarely compiled and critiqued, despite marketing techniques being one of Gordon et al.'s (2006) key principles in successfully implementing a social exchange. This section offers a critical analysis of marketing techniques and is structured as follows. A short summary explains that extending McCarthy's (1960) Four Ps to eight Ps for social marketers put the focus on relationship-building. A critique of marketing models concludes that effective social marketing needs more than tools maximising buy-in and sales to optimise relationships. An examination of extant models of partnership building finds that outcomes would improve if social marketers also used a model including OPR dimensions and affective attitude when aiming to encourage the public to voluntarily change behaviour.

2.2.1.3.1 The eighth P is Partnership

A central part of general marketing strategy, McCarthy's (1960) Four Ps have been expanded over the years to improve marketing effectiveness. The original Four Ps were: **product**, **price**, **promotion** (through such things as advertising, personal selling, public relations, direct marketing), and **place** (the channel of distribution such as website or physical outlet). Despite their popularity, the Four Ps were criticised for not covering all of the factors that a marketer should consider. Booms and Bitner (1981) extended the list to Seven Ps, the additional three elements in the marketing mix being: **people** (staff), **processes**, and **physical evidence** (such as brochures or an event's room layout). This was

still not a comprehensive list of marketing considerations for social marketing needs. Duane (2012) introduced the eighth P, **partnerships**, underlining that social marketing was not just about sales and profits. The emphasis changed with social marketers working in partnership with other stakeholders to build relationships and co-created solutions.

By maximising the strength of partnerships, social marketing ceases to be a short-term project implementing the Four Ps or Seven Ps, and instead implements long-term change strategies up, mid or downstream simultaneously over the long term, a procedure known as a Total Market Approach (TMA) to change (Lefebvre, 2011). Partnerships help to steer social marketing towards social benefit and away from the basic marketing aim of suppling demand profitably (Duane, 2012), as explored in the next two sub-sections on marketing models and partnerships.

2.2.1.3.2 Marketing models are target-hitting tools

Marketers create and satisfy demand by turning potential customers into customers, and then try to maximise sales from customers in the ‘promotion’ aspect of McCarthy’s (1960) Four Ps (CIM, 2007). However, the models used take customers through a series of steps on the journey to purchasing a good or service focus more on sales targets than long-term relationship building, assuming that individuals must experience a product or service for the relationship with an organisation to begin.

Strong (1925) recommended the four steps of the classic AIDA marketing model. The four steps of the AIDA customer journey are: **Awareness** (creating brand awareness), **Interest** (encouraging individuals to research further), **Desire** (creating an emotional connection for a brand so individuals want the product or service), **Action** (for example, purchasing, making an enquiry, downloading a brochure) (Hanlon, 2023). Some individuals are lost at each stage. There is no ongoing commitment to take those who stall at one of the stages of the model to the next stage, especially when it is easier to run a new campaign where a new set of potential customers are poured down the AIDA funnel. Relationships are only worth building and cultivating when a product or service is experienced. This favours 'easy-wins' (such as convincing people looking for a gym to join a particular gym) not hard-to-reach individuals (such as obese individuals who are frightened of joining). It is the latter who are often the target of social marketing campaigns (Hastings and Domegan, 2014).

More recently in 2010 when developing Customer Relationship Management (CRM) techniques, Smart Insights taught marketers to take the four steps of the RACE growth system, which develops long-term custom once individuals are converted into customers. The four stages of the journey are: **Reach** (for example reaching potential customers via search engines and social networks), **Act** (for example, encouraging individuals to click through to a company website), **Convert** (perhaps via the 4Ps or 7Ps), **Engage** (to prompt repeat purchases and encourage advocacy on social networks) (Chaffey, 2021). With the advent of digital media in the 1990s, Electronic Customer Relationship Management (eCRM) sees companies such as Amazon using such tools to

tempt customers to spend more via personalised email alerts and opt-in Twitter/X and Instagram accounts (Chaffey and Ellis-Chadwick, 2012). However, CRM and eCRM, while including the word ‘relationship’, are typically about maximising sales, not ongoing customer care, with much emphasis placed on numerical key performance indicators such total number of people on an email list, click-through rates to a website, conversion rates to sales, etc. (Chaffey and Ellis-Chadwick, 2012). They do not take into account the persuasiveness of OPR dimensions: control mutuality, satisfaction, trust, commitment (Hon and Grunig, 1999). Defending the role of public relations, McKie and Willis (2012:849) wrote that “such virtues as connectedness, engagement and relationship-building link an organisation to a wider stakeholder universe beyond the customer and a commercially driven value chain.”

Interestingly, the ‘promotion’ aspect of McCarthy’s (1960) Four Ps could include public relations among the marketing mix, yet without OPR dimensions this could be seen more as episodic projects to back up marketing efforts, such as advertising, direct marketing and personal selling (Brassington and Pettitt, 2013), not ongoing strategic relationship-building. Johnston and Lane (2018) conclude that episodic engagement is a net drain on relational engagement when building social capital. Not surprisingly, OPR dimensions, which influence attitude and behaviour via connections with affective and cognitive attitude, continue to be investigated within the field of public relations, not marketing, as demonstrated in the literature review on OPRs in this PhD research study.

2.2.1.3.3 Partnerships lead to cooperation

To compensate for the commercial approach to customer relationships, the field of social marketing developed a model of partnership-building. Drawing from social exchange, marriage and organisational management literature, and writing five years before Hon and Grunig's (1999) influential work on OPRs, Morgan and Hunt (1994) concluded that trust and commitment were crucial to successful relationship marketing, so that long-term cooperative relationships could be built with buyers, suppliers, internal stakeholders, governments and even competitors. The results of Morgan and Hunt's (1994) survey of the relationship that tyre manufacturers have with their suppliers were represented in a model that was later amended for social marketing purposes by Duane (2012) to facilitate a total market approach to social marketing. This model is shown below in figure 2.6. Within Duane's (2012) expanded model, shared values and communications predict trust and commitment, which in turn predict expectations of continuance and tension.

Improvements to the model could be made. Including affective trust would be important, as trust could be an effective KPI within behaviour change (Hastings and Domegan, 2014). As Mael and Tetrick's (1992) study focusing on organisational identification features the dimensions shared experiences and shared characteristics, a connection between communications and shared values should be considered, as good communications are required to foster a feeling of shared values.

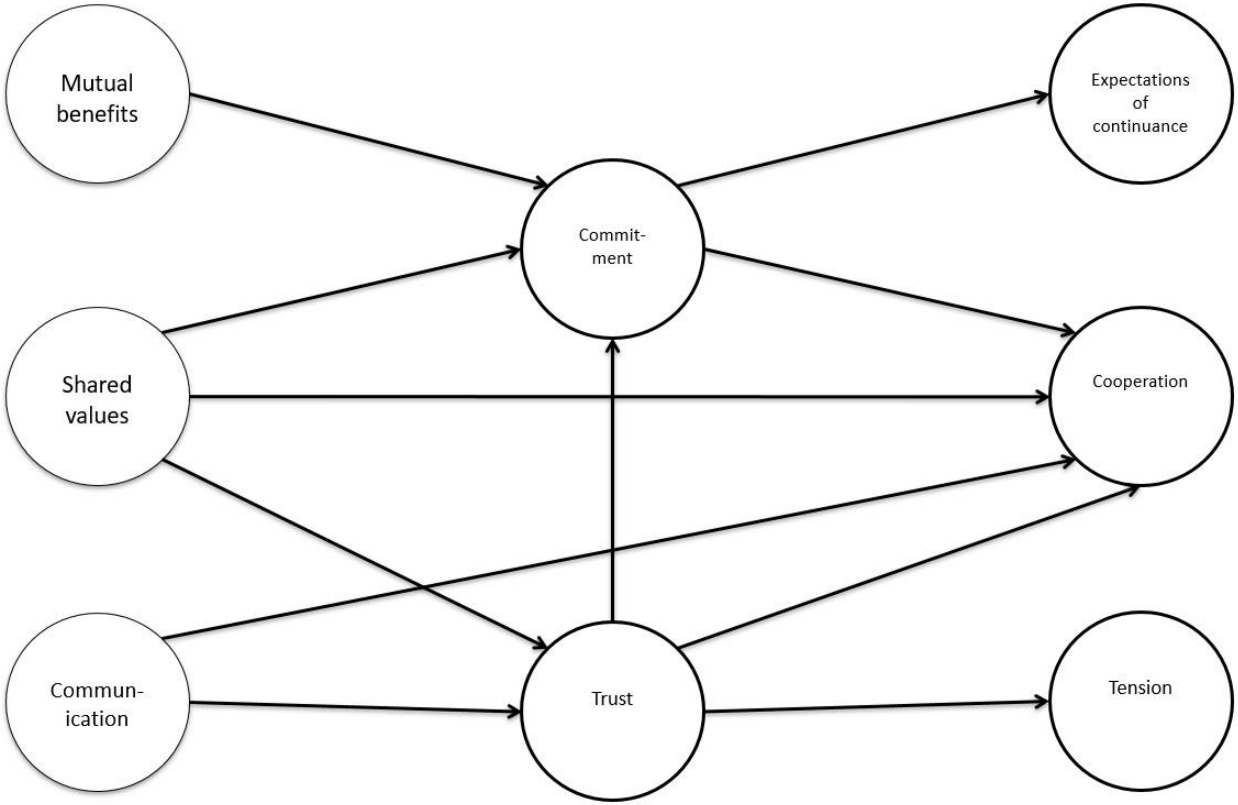


Figure 2.6: Duane's (2012) model for social media partnerships

Duane's (2012) model, when applied to each stakeholder individually within systems thinking, may be extremely well suited to governments, suppliers and project partners, such as those within a healthcare partnership. However, where changes to cognitive attitude and human social behaviours are desired, the model is of less use with the public, except that is for the minority who are enlisted to cooperate, for example via a focus group to develop a social exchange that can be used with a wider audience. Indeed, Marques and Domegan (2011) recommend working with 'clients', often meaning the public, to challenge social issues and co-create the value of changing behaviour. However, while Donovan and Henley (2010) note that higher levels of commitment lead to stakeholders being more willing to perform desired behaviours, the behaviours themselves are not included in Duane's (2012) model. A separate model featuring behavioural outcomes, such as amount of physical activity undertaken, alongside the predictors of behaviour such as attitude and OPR dimensions, should be considered within social marketing when considering the persuasive power of relationship-building with the public, utilising the social exchange co-created using Duane's (2012) model within messaging. The absence of this separate model would appear to be a research gap that could be filled with a framework of variables that includes OPR dimensions and RAA variables, as included within this PhD research study.

Having focused on three key social marketing principles, this section continues by investigating the fourth: end goals.

2.2.1.4 End goals

A concept of end goals to benefit individuals or wider society, not an organisation, is essential to social marketing success (Gordon et al., 2006). However, not all communications planning processes include end goals or aims, which are overarching statements, such as increasing the amount of physical activity in adults aged 19 to 64 (Tench and Yeomans, 2006). Similarly, not all communications planning processes include objectives, which should be SMART targets (specific, measurable, achievable, resourced and timebound, such as generating 1,000 hits on a physical exercise website in three months and getting 50 per cent of adults in their 30s to perform 75 minutes of physical exercise per week) (Tench and Yeomans, 2006). For example, Hastings and Elliot (1993) devised a marketing plan comprising eight steps, which features objectives but not goals. Meanwhile, Lefebvre and Flora (1988) introduced social marketing to public health communications, with a plan comprising six steps, including goals but not objectives. Gregory (2010) describes a similar planning process within public relations that includes both aims and objectives. Cheng, Kotler and Lee (2010) describe a social marketing Quick Reference Guide planning process, including both goals and objectives.

If public relations and marketing departments are not comprehensively defining their aims/goals and objectives the same way, it is possible that objectives may not be met and goals may not be realised. Interestingly, Grunig, Grunig and Dozier's (2002) reflections on the Excellence Study recommend keeping public relations and marketing functions separate within an organisation. However,

Estanyol (2012) recommends keeping social marketers and public relations practitioners in close contact, not only to make sure keep goals/aims and objectives remain compatible, but to cross-pollinate research findings. Audience research within marketing could certainly be enhanced by environmental analysis conducted by a public relations department and vice versa. Messages should also be compatible, so they do not contradict or cancel out one another.

This brief focus on end goals is followed by a conclusion summarising key findings from this review of social marketing.

2.2.2 Conclusion

This review investigated Gordon et al.'s (2006) principles of social marketing to observe the mechanisms of social marketing on a macro scale: social exchange, relationships, marketing techniques and end goals.

Alongside the competent and ethical use of the other Ps, relationships in terms of partnership building are key to successful social marketing campaigns achieving voluntary behaviour change. However, models of partnership-building within social marketing should be complemented with a separate model including OPR dimensions along with the variable attitude. Including affective trust would be important, as levels of trust could be an effective KPI along the route to behaviour change (Hastings and Domegan, 2014). Such a

model, which could be used alongside the Duane's (2012) model, is developed within this PhD research study to fill a substantial research gap.

While Andreasen (2003:299) describes social marketing as a separate discipline to achieve social change "as contrasted to other approaches including education, communications, the law, community mobilisation, and so on" it is useful to focus on the microelement of message framing within a message compromise, as one part of a social marketing project focusing on the 8Ps. Focusing on the wider value of a behaviour, such as short-term benefits, and considering the correct framing, could help provide the impact required to reverse worrying UK public health trends – with the target stakeholder being all adults in a particular health authority's region. To avoid confusing messaging and to maximise campaign effectiveness to achieve common end goals, these message frames should be formulated in collaboration with an organisation's public relations team, which will be more aware of complementary strategies to build OPRs.

Having emphasised the value of OPRs and investigated unique characteristics of social marketing such as social exchange, it is essential the literature of persuasion be reviewed, to learn how carefully constructed message-framing can lead to persistent behaviour change via key persuasion models: the ELM and the RAA.

2.3 Persuasion

This literature review of persuasion is structured as follows. First, it introduces and critiques two models of persuasion used within this PhD research study: the Reasoned Action Approach (RAA) (Fishbein and Ajzen, 2010) and the Elaboration Likelihood Model (ELM) (Petty and Cacioppo, 1986). This is followed by sections on message framing and the mechanisms that influence the RAA: variables belief, affect, attitude and behaviour. Further research hypotheses are developed within these sections.

2.3.1 Models of persuasion

Rosenberg and Hovland's (1960) Tripartite Model of Attitude exerted a great influence over social psychology literature: Eagly and Chaiken (2007) explain the model, reiterating that attitudes form when a person responds evaluatively to a stimulus in three ways: affectively (emotionally), cognitively (thinking), behaviourally (doing). Cognition is defined as "the mental activities involved in acquiring and processing information" (Colman, 2003:140). Affect is defined as "emotion or subjectively experienced feeling" (Colman, 2003:14), with emotions formed following initial cognitive activity and primary and secondary appraisals of a situation (Smith and Lazarus, 1990). With belief modelled as a component of attitude, these evaluative responses (affectively, cognitively, behaviourally) interact to form an individual's attitude. The Tripartite Model of Attitude influenced the development of the RAA and ELM. These models are introduced in the following sections.

2.3.1.1 Reasoned Action Approach

The RAA (Fishbein and Ajzen, 2010) is one of the most widely used frameworks for the prediction and change of human social behaviour (Pressgrove, McKeever and Collins, 2021). Modelling beliefs as predictors of attitude with separate assessments, it describes the often-weak relationship between attitudes and behaviour via the mediator behavioural intention, which is predicted by three evaluations (Ajzen, 2012), as shown in figure 2.7 below.

1) attitudes towards the behaviour, predicted by behavioural beliefs
2) subjective norm (the motivation to comply), predicted by normative beliefs
3) perceived behavioural control or self-efficacy (the ability to respond), predicted by control beliefs

Despite being based on information accessible in memory, these evaluations have cognitive and affective attributes: attitude includes instrumental (cognitive) and experiential (affective) subcomponents (Fishbein and Ajzen, 2010).

Meta-analysis has shown that these evaluations account for 39% of the variance in behavioural intention and 27% of the variance in behaviour (Armitage and Conner, 2001).

Within the framework, behavioural, normative and control beliefs are predicted by background factors: dispositions, demographics and information.

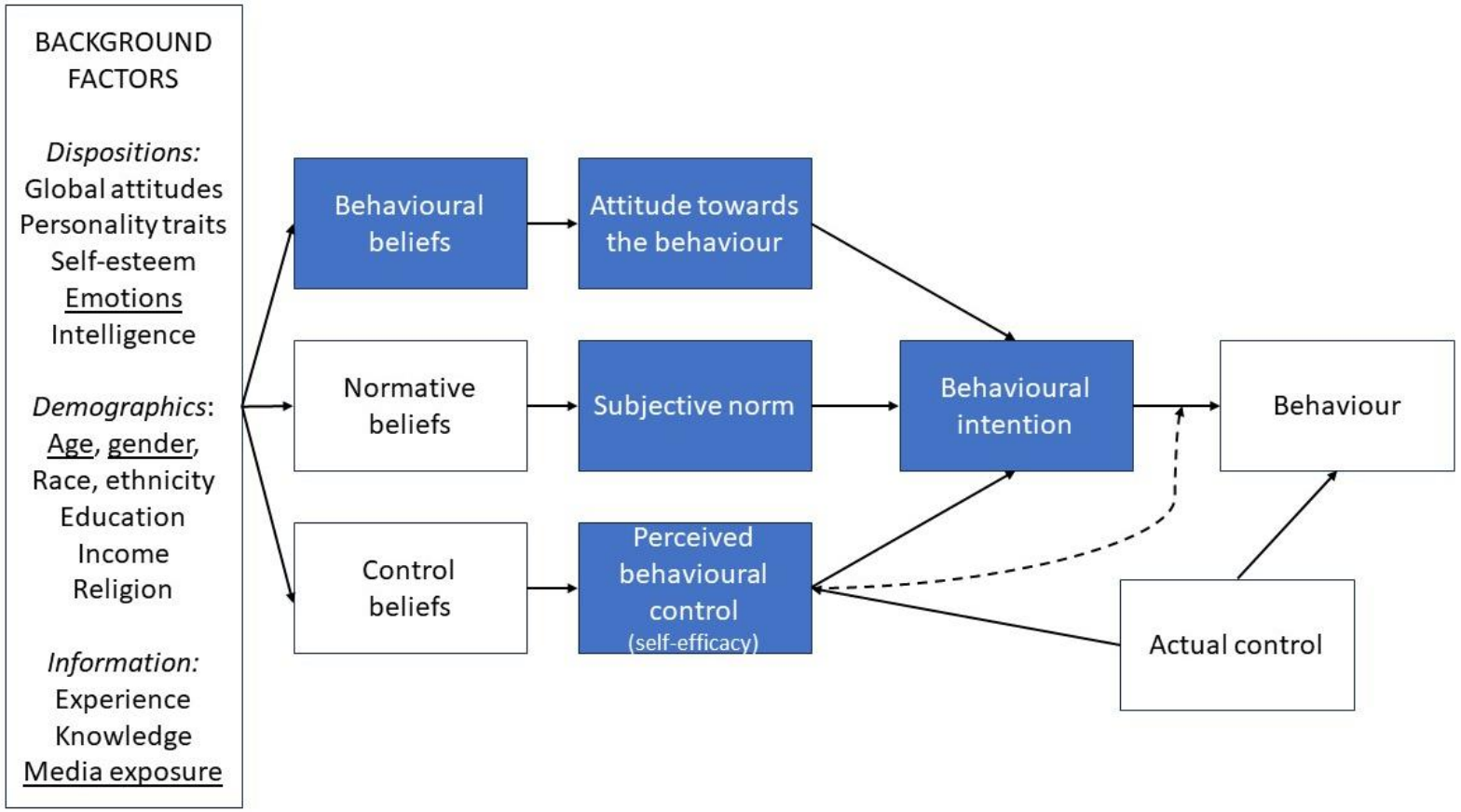


Figure 2.7: The Reasoned Action Approach (Fishbein and Ajzen, 2010).

The variables in blue are measured in this PhD research study along with the underlined background factors: emotions, media exposure, age, gender.

Many studies use PLS-SEMs and Smart PLS software to model the RAA in a range of contexts, due to the technique's suitability with complex models, particularly those with non-parametric data not conforming to a normal distribution. For example, Londoño-Roldan, Davies and Elms (2017) (role of anticipated negative emotions on channel intention); Ilham, et al. (2019) (effect of trust on behavioural intention for smart city management); Hassan, Kadir and Aziz (2020) (students' intentions to use biodegradable drinking straws); Asante, Ocran and Inkoom (2023) (pesticide use in Ghana); and Hu et al. (2025) (consumption of sugar-sweetened beverages among students).

To aid understanding, the RAA variables used in this research study's conceptual model appear with blue shading in figure 2.7. The three evaluations are included as variables in this PhD research study as predictors of behavioural intention. Attitude is clearly of interest as it is predicted by OPR dimensions (Bruning, Langenhop and Green, 2004; Ki and Hon, 2007a). Self-efficacy and subjective norm are included, as the perceived ability to respond to the call to exercise more, and the motivation to comply to the expectations of others, are clearly of interest as comparative influences when conducting a social marketing communications campaign promoting exercise (Lawton, Conner and McEachan, 2009; McEachan et al., 2016; Arevalo and Brown, 2019; Jones and Norman, 2021).

Emotions and media exposure are also included in this research study. The RAA includes emotions and media exposure as background factors (found in

the box on the far left of figure 2.7) that predict attitude, subjective norms and self-efficacy (Fishbein and Ajzen, 2010; Ajzen, 2011). The RAA assumes that background factors are predictors of the model's variables; that is, they do not influence behavioural intention or behaviour directly but are predictors of the three belief variables (behavioural belief, normative belief, control belief) that in turn influence attitude, subjective norm and self-efficacy, as shown in figure 2.7. This is called the sufficiency assumption. The emotions influence the affective dimensions of these three variables (Lawton, Conner and McEachan, 2009; Hagger, 2019; Ajzen, 1991). Six emotions have been chosen to act as background factors in this PhD research study, so as to include the positive and negative emotions most regularly researched in persuasion literature (Dillard et al., 1996). They are happiness, sadness, guilt, gratitude, fear and anger.

Additional background factors included within this PhD study are age and gender, to build a profile of respondents within the results chapter. No other background factors are included, as the study does not need to divide respondents into groups according to other background factors.

Some of the variables in figure 2.7 are not included in this study's conceptual model. Behaviour is not included as it is predicted by behavioural intention within the RAA, which mediates between the three evaluations (attitude, subjective norm, self-efficacy) and behaviour. Indeed, Lawton, Conner and McEachan (2009) conclude that behavioural intention fully mediates the relationship between affective attitude and behaviour for physical activity.

Normative beliefs, control beliefs and action control are not included as they do not predict nor are they predicted by OPR dimensions hence they are not of interest within in this PhD research study looking at the role of OPRs within a social marketing campaign. Many studies have elected not to use certain RAA variables, depending on the aim of the research and the variables required within a model to meet that aim. For example, Hagger, Polet and Lintunen (2018) and McEachan et al. (2016) use only the elements of attitude, self-efficacy and subjective norm in a research model assessing the direct and indirect influence of past behaviour on behavioual intention and behaviour. Hennessy, Bleakley and Fishbein (2012) did not measure normative beliefs nor control beliefs when investigating contraceptive use.

2.3.1.1.1 Criticism of the Reasoned Action Approach

Armitage and Conner (2001) concluded that the RAA's three evaluations account for 27 per cent of the variance in behaviour, hence many influences on behaviour are absent from the model, including OPR dimensions. As a social cognition model based on reasoned action, nor does the RAA satisfactorily explain how affect is able to influence affective attitude directly despite many studies having made direct connections between affect and attitude or affective attitude and a behavioural variable (van Giesen et al., 2015; Pressgrove, McKeever and Collins, 2021). The direct connection between affect and affective attitude has therefore been included in the analysis in this PhD research study despite the existence of the RAA's sufficiency assumption.

Past behaviour is also missing in the RAA. Hagger, Polet and Lintunen (2018) note the substantial effects of past attitudes and behaviour on subsequent behaviour, which is often encouraged by social influences and norms (Festinger, 1957). When past behaviour has a direct effect on future behaviour, this is also often ascribed to habit (Gardner, de Bruijn and Lally, 2011; Ouellette and Wood, 1998). Hence Jones and Norman (2021) include past behaviour as a direct predictor of behavioural intention and behaviour, when focusing on students' post-university exercise intentions and behaviour.

Past behaviour is not included in this PhD research study. Instead, initial behavioural intention is included as a direct predictor of new behavioural intention, alongside attitude, subjective norm and self-efficacy. Although a predictor of past behaviour, it is included in preference to past behaviour as the study measures the effect of message-framing on new levels of behavioural intention, so it is essential to quantify behavioural intention before and after the issuing of messaging.

Indeed, initial behavioural intention serves as a control variable, to help ensure a causal interpretation for the relationship between the other predictors and new behavioural intention. Edwards and Bagozzi (2000) emphasise that alternative causal explanations of observed relationships must be ruled out. This is due to endogeneity, when a predictor correlates with an extraneous variable not included in a model, artificially inflating the size of the relationship between predictors and the dependant variable (Hult et al., 2018). Hence

control variables are often called confounding variables or covariates (Kirk, 1995). As initial behavioural intention is very likely to correlate with new levels of attitude following a marketing campaign, it must be included as a control variable within the conceptual model otherwise attitude would correlate with an extraneous variable (initial behavioural intention). It is important to find a genuine causal interpretation as researchers must find “actionable implications that would capture the attention of the practitioner community” (Kumar, 2016:6).

Summarising the linkages discussed so far, the variables from the RAA included in this PhD research study are included in an enlarged version of the conceptual model in figure 2.8a. In this diagram, behavioural belief is simply called belief as only one belief variable is included from the RAA. Emotions link to belief as a background factor and directly to attitudinal variables. The OPR dimensions from figure 2.5 on page 65 link to attitude as explored in section 2.1. Initial behavioural intention links to behavioural intention.

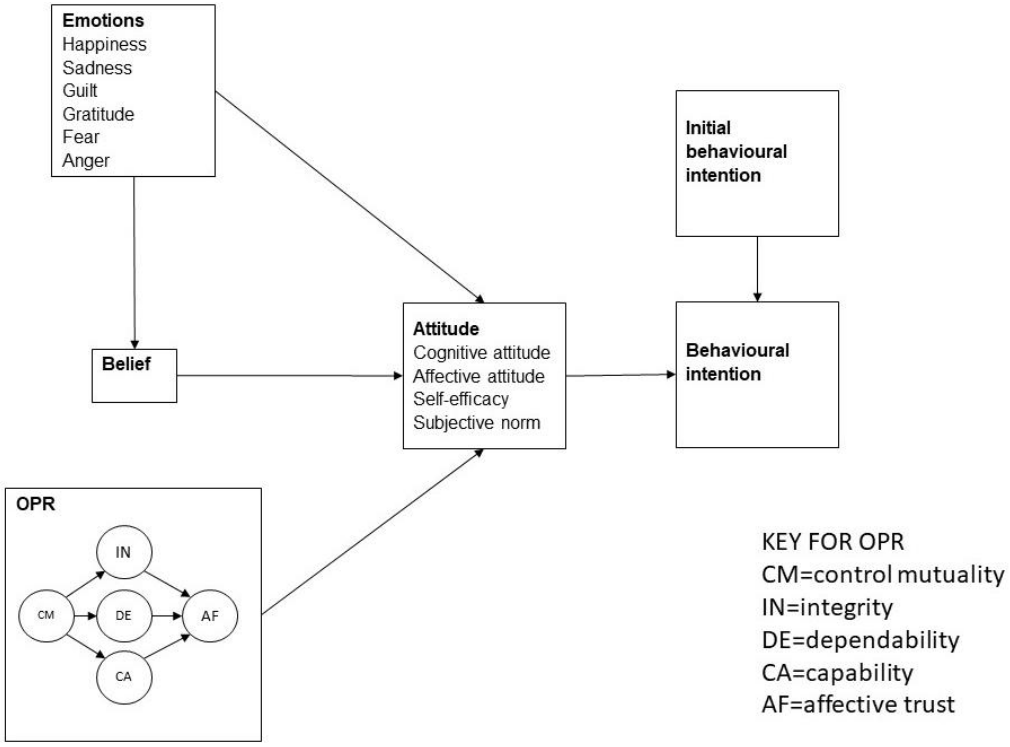


Figure 2.8a: Conceptual model connecting the variables from the Reasoned Action Approach used in this study to the OPR dimensions.

2.3.1.2 Elaboration Likelihood Model

The ELM is described as an essential tool for communicators (Petty et al., 2018), as it describes many, though not all, of the routes to attitude change via the potential effect on belief of cognition or emotions. Following communications, elaboration likelihood (the chance of an individual thinking further about the topic) can be:

- constrained high (additional thinking takes place along a central route when motivation and ability to scrutinise arguments are high)
- constrained low (individuals take a peripheral route perhaps persuaded by the influence on belief of simple cue effects, such as the presence of an expert in an advertisement or the feeling of positive emotions)
- unconstrained (additional thinking may take place depending on an individual's circumstances and motivation and the message content)

When elaboration likelihood is unconstrained, an individual is able to think about a topic relevant to him or her, without limiting factors such as disturbances, time constraints or overly complicated information (Petty and Wegener, 1998). The relative position on the continuum between the two extremes of central and peripheral route are also dependent on the individual's motivation and ability to think more about a topic. Persuasive message framing and engaging rhetoric improve the chances of thinking taking place for those of unconstrained elaboration likelihood (Petty and Cacioppo, 1986; Kent, 2015; Petty et al., 2018), whereas imposing time constraints, for example a promotional sale, lowers the likelihood of further elaboration, although a lack of

thinking time may persuade an individual to make a hasty or impulse decision (Jackson, 1990). Behaviour based on low elaboration may not persist beyond the short-term though due to competing cue effects associated with an alternative activity, such as a more attractive spokesperson.

Emotions can influence persuasiveness within ELM, the exact influence again dependant on whether elaboration likelihood is constrained high, constrained low or is unconstrained, and on whether emotions are experienced before or after secondary cognition takes place (the phase of thinking where an individual reviews his or her previous thinking on a topic) (Petty and Briñol, 2015) as described later in section 2.3.4 on pages 126-129. Indeed, the role of elaboration likelihood is included within this PhD research study as a moderator, as shown in the expanded conceptual model in figure 2.8b on page 106. It is shown as altering the relationships between variables, depending on whether it is constrained high, constrained low or is unconstrained. In addition to the effect of emotions on belief varying due to elaboration likelihood, the relationships between other variables are moderated by elaboration likelihood. This is because the variables within the boxes labelled belief, attitude and OPR (specifically trust) have a cognitive and affective element. Hence the relationships between variables are likely to change depending on the level of elaboration likelihood. When elaboration likelihood is relatively high, the cognitive elements of a variable are likely to have a stronger relationship with a variable it is predicting. When elaboration likelihood is constrained low, the affective elements of a variable are likely to have more of an influence on the variable it is predicting.

Many studies have used SEMs or hierarchical regression analysis to model the moderating effect of elaboration likelihood. For example: Wu and Wang (2012) (customer loyalty to airline service providers); and Li and See-To (2023) (effect of source credibility on electronic word of mouth).

Within this PhD research study, three hypotheses test the moderating effects of elaboration likelihood, focusing on the moderation of the relationships between the predictors of behavioural intention (attitude, subjective norm, self-efficacy) and behavioural intention, to help explain the reasons for differing results in four clusters of data. They predict that high elaboration likelihood will strengthen the influence of attitude on behavioural intention, but weaken the influence of self-efficacy and subjective norm on behavioural intention. This is because high elaboration likelihood is associated with a higher need for cognition and hence the greater influence of cognitive attitude, whereas low elaboration likelihood sees predictors less dependent on cognitive processing having a higher influence (Petty and Cacioppo, 1986). The hypotheses are:

H5a When elaboration likelihood is high, the relationship between attitude and behavioural intention is stronger than when it is low

H5b When elaboration likelihood is high, the strength of relationship between subjective norm and behavioural intention is weaker than when it is low

H5c When elaboration likelihood is high, the strength of relationship between self-efficacy and behavioural intention is weaker than when it is low

2.3.1.2.1 Criticism of Elaboration Likelihood Model

Despite its strengths, Petty and Cacioppo's (1986) model is criticised for lacking empirical testing, and for primarily focusing on how cognition and affect build cognitive attitude. Although heuristic cues caused by emotions connect affect to attitude via belief, it does not adequately give account of the role of affective attitude and assumes that cognition is the chief ingredient of attitude certainty (Kitchen et al., 2014; Morris, Woo and Singh, 2005). The ELM also does not give account of the persuasiveness of OPR dimensions.

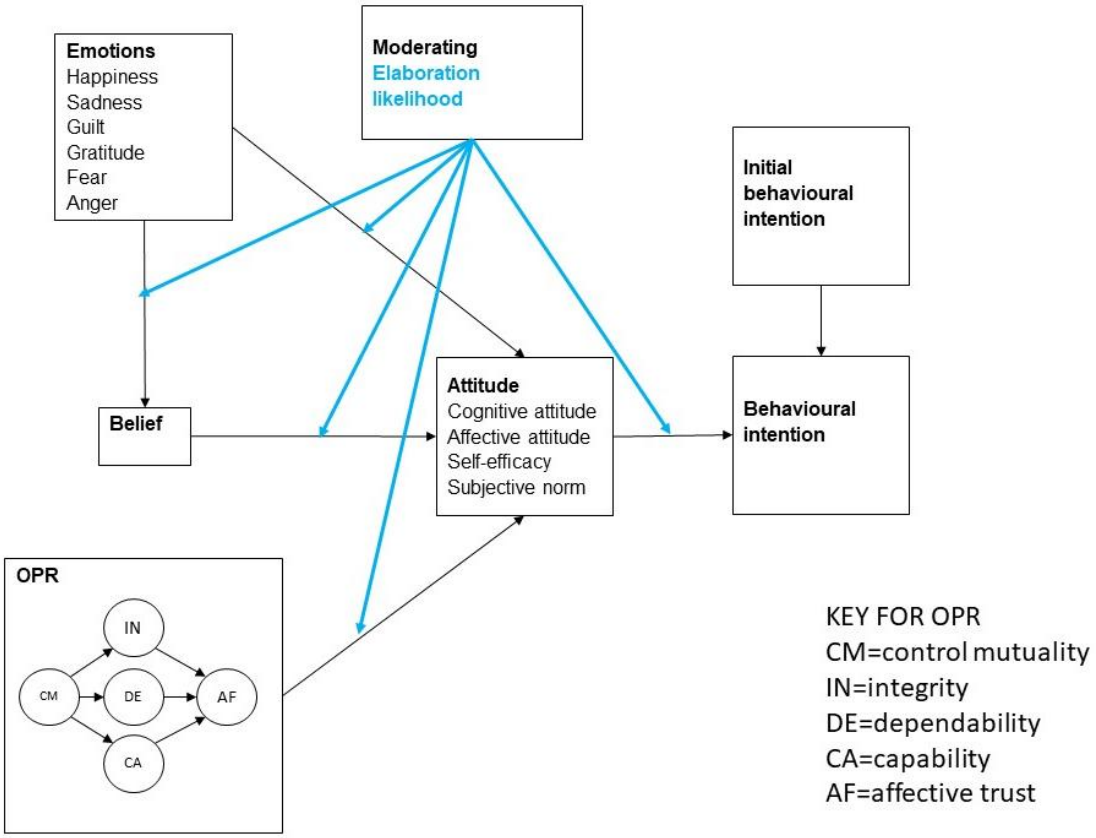


Figure 2.8b: Conceptual model expanded to include the moderating variable elaboration likelihood.

Model additions included in blue.

As the ELM and RAA both refer to media exposure, the considerations when formulating message-framing to issue a persuasive appeal are investigated in the following section.

2.3.2 Message-framing

Choosing the right message frame and delivering it well are crucial for maximising social marketing effectiveness. Messages can be informational, feeding acute or routine needs, or transformational, appealing to emotions or the five senses (Kim and Yang, 2017).

This section 2.3.2 is structured as follows. It establishes, with references to the ELM, that to bring about behaviour change, cognitive message frames, when deemed appropriate, must be chosen strategically and delivered with strong arguments and persuasive framing. It also establishes, with references to the ELM and the RAA, that affective message frames, when deemed appropriate, must also be developed strategically, as discrete emotions, such as fear and happiness, can influence belief, trust (an OPR dimension), attitude, self-efficacy and subjective norm separately, the combined effect possibly leading to no overall effect on new behavioural intention. If some effects are positive while others are negative, it may be that behaviour does not change. The section concludes that the variables belief, affect, attitude and behaviour must be examined more closely to understand how message framing influences individuals.

2.3.2.1 Strategic cognitive messages need a convincing argument

A message must be convincing. Petty and Cacioppo (1984) and Petty, Briñol et al. (2018) demonstrate that, when other variables are controlled, the quality of an argument that has an individual's attention has a strong influence on persuasiveness. Festinger (1957) emphasises that having more than one convincing argument can also have a persuasive effect.

Additionally, cognitive messages should be delivered in an optimal message frame, to encourage message processing and enhance persuasiveness, as discussed in the following section.

2.3.2.1.1 Framing influences message effectiveness

Framing is presenting and interpreting reality to influence stakeholders' understanding and subsequent choices (Ma and Bentley, 2022). Entman (1993) explains that framed messages are typified keywords, stock phrases, stereotyped images, sources of information and sentences with thematically reinforcing clusters of facts or judgments.

Valence framing is typically used in marketing communications messaging. There are two types of valence framing: actions framing (positive or negative information) and risky choice framing (derived from Prospect Theory - how

people take greater risks when a choice is expressed as a loss rather than a gain). Getting framing right is important as it can influence elaboration.

2.3.2.1.2 Framing can influence elaboration

Smith and Petty (1996) reported the effects of different message frames. Very simple messages may act as a cue, with positive messaging boosting perceptions of a behaviour and hence influencing belief. For more complicated communications messages, unexpected framing (such as negative framing when positive framing was expected) may lead to more cognitive processing, perhaps when using news story framing (Hallahan, 1999). This processing may influence levels of belief if different conclusions are reached. This echoes Fiske's (1980) conclusion that negative and extreme information gets more attention. For messages with even more complicated content, negative framing may lead to higher levels of elaboration, which may also influence belief. Of course, if an individual is not motivated to process a more complicated message, they may only respond to peripheral cues (such as a positive tone) regardless of message complexity. Conversely, an individual motivated to process more is not able to do so if only presented with a simple message and may again only respond to cues (Petty and Cacioppo, 1986). Interestingly, Jones, Sinclair and Corneya (2006) found that elaboration increased following a credible source with a positive message when promoting physical exercise. Collectively these results imply that message frames should ideally be tailored to individuals, and to a topic, for maximum effectiveness.

2.3.2.2 Affective messages influence belief, trust and attitude

An affective message is sometimes more effective than a cognitive message, particularly when elaboration likelihood is constrained low (Petty and Cacioppo, 1986; Clarkson, Tormala and Rucker, 2011). It is a communication that attempts to persuade an individual using emotions, such as happiness or fear. Inducing emotions is possible in a variety of ways: for example, via an experience such as the taste of a drink or the tone of a message (Fabrigar and Petty, 1999) or via valence framing (Hallahan, 1999). When evaluating unfamiliar realistic attitude objects, such as a new public health service, people rely more on affect than cognition (van Giesen et al., 2015).

An affective message frame can exert a direct effect on attitude (van Giesen et al., 2015; Pressgrove, McKeever and Collins, 2021) but it can also influence belief in various ways. Indeed, Petty and Briñol (2015) note that when the emotion evoked by a message matches the emotions already being experienced by the recipient, the individual may find the message more persuasive, especially when elaboration likelihood is constrained low, simply because the message feels right and is a good fit. Such cue effects could influence belief while an emotion simultaneously influences affective attitude.

An affective message frame can influence affective trust and hence OPRs (Dunn and Schweitzer, 2005). Pfau (1990) teaches that television, a ‘cool’ medium requiring very little involvement (McLuhan, 1964), is good for inducing

a command (relational) effect, bringing the opportunity to see facial expressions and nurture likeability, building both cognitive and affective forms of trust.

Cognition and affect may be induced and experienced simultaneously, as it is difficult to induce them independently. However, as discussed below in section 2.3.4, this is because some emotions, such as fear, may influence cognitive processing to improve belief levels (Petty and Cacioppo, 2015).

As framing (cognitive/affective, positive/negative) influences the relationship between variables in the RAA, it is included in figure 2.8c below as a second moderating variable. This is because the relationship between emotions and belief, and between emotions and OPRs, differs depending on whether an individual is more receptive to affective or cognitive message-framing. In addition, the variables within the boxes labelled belief, attitude and OPRs in figure 2.8c have cognitive and affective elements. Hence the relationships between these variables and the variables they predict change depending on the message frame. For example, when an individual is more responsive to a cognitive message frame, cognitive attitude is likely to have a relatively stronger relationship with behavioural intention. When an individual is more responsive to an affective message, affective attitude is likely to have a relatively stronger relationship with behavioural intention. The theorised link between emotions and OPRs is also included in figure 2.8c. This moderating effect of message framing is separate to the RAA background factor media exposure in the RAA

(shown in figure 2.7), which is the bare facts of a topic not the way it is framed. It is also separate to the moderating effect of elaboration likelihood.

Eight hypotheses test the moderating effects of message framing, focusing on the moderation of the relationships between the predictors of behavioural intention (attitude, subjective norm, self-efficacy, initial behavioural intention) and new behavioural intention, to help explain the reasons for differing results in the four clusters of data in this PhD study.

H6a$_1$ When a message is positive, the relationship between attitude and new behavioural intention is stronger than when it is negative

H6a$_2$ When a message is cognitive, the relationship between attitude and new behavioural intention is stronger than when it is affective

H6b$_1$ When a message is positive, the relationship between subjective norm and new behavioural intention is stronger than when it is negative

H6b$_2$ When a message is cognitive, the relationship between subjective norm and new behavioural intention is stronger than when it is affective

H6c$_1$ When a message is positive, the relationship between self-efficacy and new behavioural intention is stronger than when it is negative

H6c$_2$ When a message is cognitive, the relationship between self-efficacy and new behavioural intention is stronger than when it is affective

H6d$_1$ When a message is positive, the relationship between initial behavioural intention and new behavioural intention is stronger than when it is negative

H6d$_2$ When a message is cognitive, the relationship between initial behavioural intention and new behavioural intention is stronger than when it is affective

A social marketer would not have enough information from a study of message framing to fully understand the most effective route to behaviour change. For example, for message framing to influence the relationship between fear and belief, the emotion of fear has to be competently induced for it to be experienced in the first place. Hence the mechanisms influencing the other variables in the RAA framework used in this PhD study are discussed in the following sections: 2.3.3 Affect, 2.3.4 Belief, 2.3.5 Attitude, 2.3.6 Behaviour.

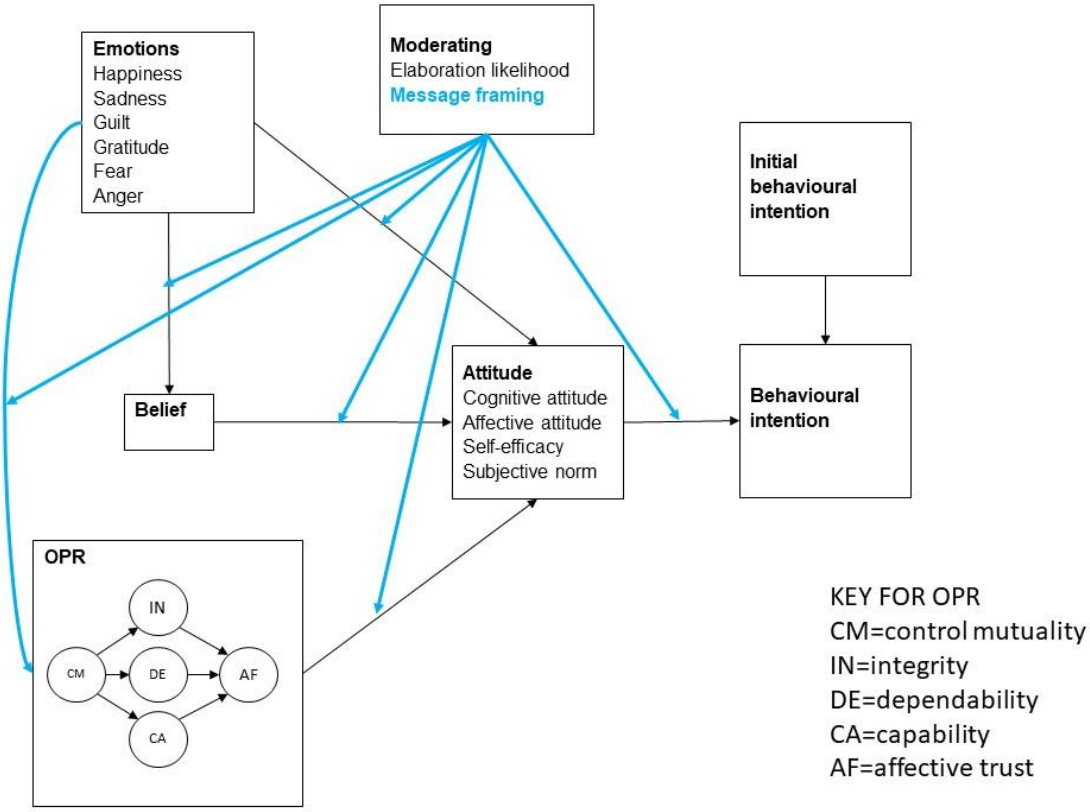


Figure 2.8c: Conceptual model including the moderating variable message framing and the connection between emotions and OPR

2.3.3 Affect

Affect, the experience of feeling emotion or mood, is shown as six variables within this PhD research study in the conceptual model (as shown in figure 2.8c above). Investigating how emotions are formed, and hence how they can be used to manipulate, gives a valuable insight when maximising the persuasiveness of OPR dimensions and other variables in the conceptual model during affective message-framing.

Researchers have disagreed on definitive categories for emotions (such as fear and anger) and non-emotional states (such as thirst and hunger) (Smith and Lazarus, 1990). Drever's (1952:80) definition states: "Differently described and explained by different psychologists, but all agree that it is a complex state of the organism, involving bodily changes of a widespread character-in breathing, pulse, gland secretion, etc., and, on the mental side, a state of excitement or perturbation, marked by strong feeling, and usually an impulse toward a definitive form of behaviour." Colman (2003:244) defined emotion as "any short-term evaluative, affective, intentional, psychological state".

This section 2.3.3 is structured as follows. Sections 2.3.3.1 and 2.3.3.2 explore the cognitive appraisal theory of emotions, finding that emotions are experienced following a series of cognitive appraisals of a situation. Section 2.3.3.3 investigates how the experiencing an emotion leads to a tendency to take action. Section 2.3.3.4 offers three criticisms of appraisal theory.

2.3.3.1 Emotion formation: initial cognitive activity

Influenced by Arnold's (1960) theory of appraisals, Smith and Lazarus (1990) state that emotions result from cognitive activity, with the initial response to a situation based on personality-dependent information of the knowledge and existing beliefs regarding a situation. This knowledge in itself is not enough to form an emotion though. Smith and Lazarus's (1990) model outlines that this initial cognitive activity is part of a process and precedes primary and secondary appraisals of a situation before an emotion is formed.

2.3.3.2 Emotion formation: primary and secondary appraisal

Smith and Lazarus's model (1990) assumes that once the initial cognitive activity has taken place, a primary appraisal of the situation is made automatically via two cognitive variables:

- motivational relevance (relating to personal goals)
- motivational congruence (whether the situation aids or thwarts goals)

For example, when responding to publicity promoting physical exercise, the primary appraisal could conclude that the individual has a goal of doing 75 minutes of exercise per week but is not meeting the goal – hence the situation is motivationally relevant and motivationally incongruent. This primary appraisal is followed by secondary appraisal regarding coping with the situation (Smith and Lazarus, 1990). Secondary appraisal comprises four variables:

- accountability (who is responsible for the situation, the self or another)
- problem-focused coping (the ability to act and manage the situation)
- emotion-focused coping as introduced by Lazarus and Folkman (1984) (regulating emotions to alter the significance of the source by adjusting, denying the threat exists, creating distance or avoiding thinking)
- future expectancy (of changes to the current situation)

In a review of cognitive appraisal literature, Watson and Spence (2007) add the following secondary appraisal variables:

- fairness (how morally appropriate one perceives the situation to be)
- certainty (how certain someone is about how an outcome will influence how they feel about it)

Following secondary appraisal, a core relationship theme is identified, before a discrete emotion is experienced, each emotion being a unique set of results from these cognitive appraisals. For instance, the core relationship theme of other-blame becomes anger in this model; irrevocable loss becomes sadness, self-blame becomes guilt (Smith and Lazarus, 1990).

2.3.3.3 Registering emotion leads to action tendencies

Experiencing an emotion often leads to a course of action, hence Smith and Lazarus (1990) summarise how core relationship themes lead to proposed adaptive functions (the resulting behavioural decision) for emotions. However, human response is described in more detail by Dillard et al. (1996) as action

tendencies, which could potentially be useful to communicators. For guilt, the appraisal components record that a situation is motivationally relevant (the topic is important to the individual), motivationally incongruent (a target such as number of minutes of exercise per week is not being met) and there is self-accountability (the individual is responsible for rectifying the situation). Once guilt is experienced, the resulting action tendency of not meeting physical exercise goals is to strive to attain the desired standard.

2.3.3.4 Criticism of attribution theory

Many experiments have shown support for appraisal theory (Tong, 2015; Fontaine, Scherer and Soriano, 2013). However, three criticisms are evident. Firstly, the definitions of Smith and Lazarus's (1993) action tendencies do not take into account different levels of elaboration likelihood, as guilt, with negative valence, could also possibly dissuade an individual from exercising more if elaboration likelihood is constrained low, as the emotion could have a negative cue effect on belief that undermines the urge to attain the required standard of attainment (Petty and Briñol, 2015).

Secondly, action tendencies also do not consider the various pathways through which emotions may lead to action, as shown in figure 2.8c above. Hence the total effect of an emotion is not accounted for.

Thirdly, appraisal theory does not focus on the resulting intensity of emotions. Bagozzi, Baumgartner and Pieters (1998) describe intensity through a series of global and local variables, covering sense of reality, proximity (in time and space), the level of existing arousal, the desirability of a situation, the amount of effort required to achieve a goal and the praiseworthiness of an action.

This PhD research study is interested in the total effect of each emotion on behavioural intention along all possible pathways, as these total effects can be compared with the total effect of OPRs and belief to meet the research aim. Hypotheses H7a to H7f predict that, following a message, the six emotions of interest will have a statistically significant indirect relationship with behavioural intention on at least one pathway.

H7a Happiness influences behavioural intention

H7b Sadness influences behavioural intention

H7c Fear influences behavioural intention

H7d Anger influences behavioural intention

H7e Gratitude influences behavioural intention

H7f Guilt influences behavioural intention

As emotions are dependent on cognitive appraisals of belief, belief is the focus of the following section.

2.3.4 Belief

Belief has been defined as “commitment to something, involving intellectual assent” (Columbia Electronic Encyclopedia, 2013) and “any simple proposition, conscious or unconscious, inferred from what a person says or does capable of being preceded by the phrase, ‘I believe that’” (Rokeach, 1969:113). Tench and Yeomans (2006) divide beliefs into two types: central beliefs relate to important issues such as faith and ethics, whereas peripheral beliefs relate to less serious matters such as opinions regarding a product or service. Individuals regarding beliefs about physical exercise as peripheral will be easier to persuade (Tench and Yeomans, 2006). Beliefs are often subjective opinion as they are influenced by social mores and experience (Festinger, 1957; Fishbein and Ajzen, 2010).

As the RAA variables control belief and normative belief are not analysed in this PhD study, for simplicity the RAA variable behavioural belief is referred to as belief, as previously mentioned.

Section 2.3.4 is structured as follows. The position of belief within the RAA and ELM and links with OPRs are examined. To understand how belief can be influenced, the mechanisms behind belief, which is based on primary cognition or secondary cognition, are explored. The effects of emotions on belief are also examined.

2.3.4.1 Belief within the RAA and ELM

Of particular importance to this PhD research study is the way OPR theory connects to the RAA. There is evidence that attitude is indirectly influenced by OPRs, with belief (a belief about the consequences of a behaviour – such as physical exercise is good for your health) mediating between the OPR dimension control mutuality and attitude, due to dialogic communication aiding understanding. Indeed, Roper, Zorn and Weaver (2004:11) note that dialogue can "encourage understanding". Ki and Hon (2007a) found a significant relationship between control mutuality and attitude, and Sisson (2017) found a significant relationship between control mutuality and social media engagement, although neither study tested whether the effects were mediated by behavioural belief. A relationship between control mutuality and belief would create an additional connection between OPRs and the RAA. Its investigation remains an interesting research gap that would potentially assist organisations in the building of a framework of variables to predict and change human behaviour (Hagger, 2019; Cheng, 2018). Therefore, the conceptual model is expanded in figure 2.8d to include this relationship. It also includes the effects of moderators on this relationship. Hence Hypothesis H8 tests for the following:

H8 Control mutuality positively influences belief

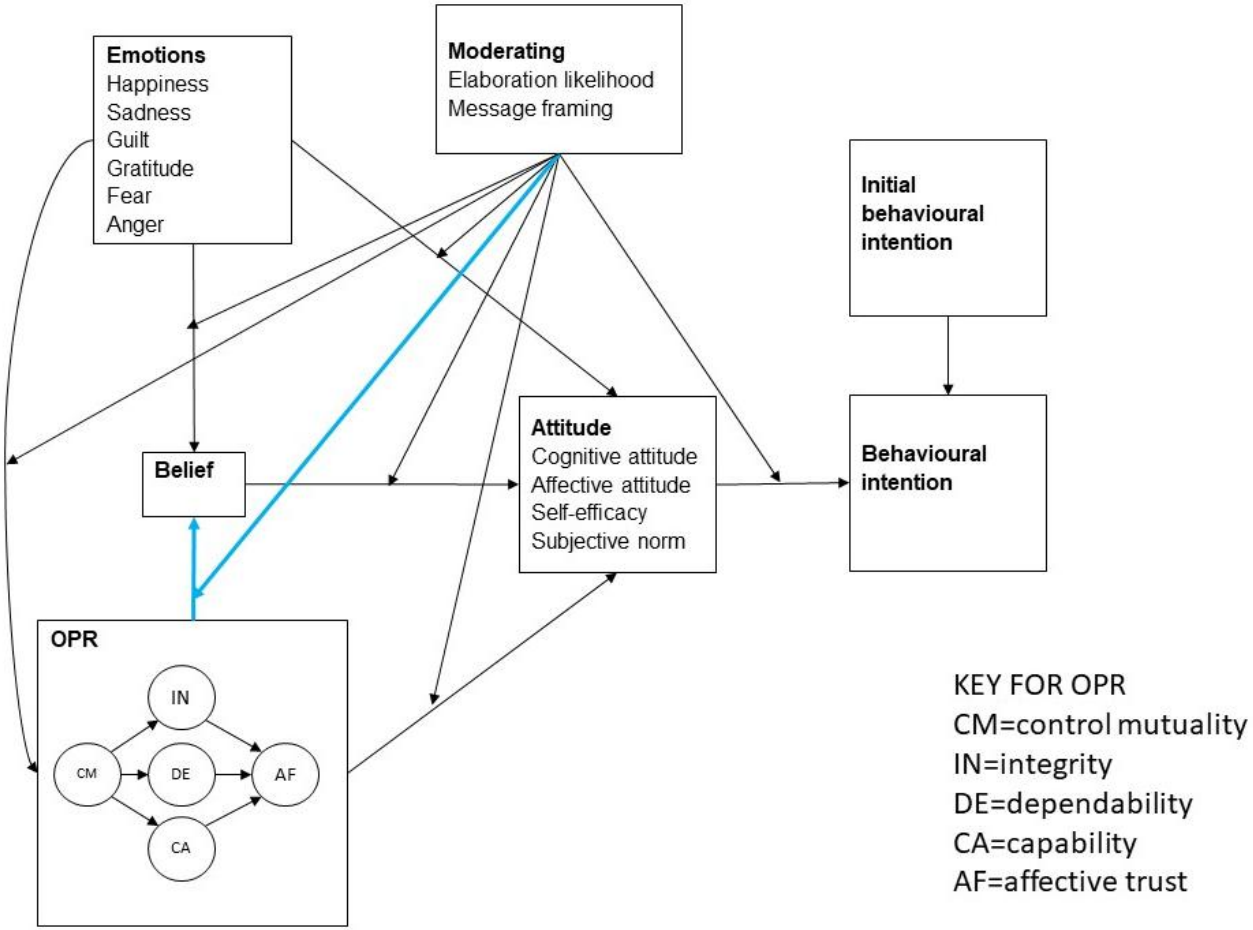


Figure 2.8d: Conceptual model expanded to include the link between OPR and belief. Additions to the diagram in blue.

Within the ELM, Petty and Cacioppo (1986) explain that individuals are not always motivated or able to take a central route through the active processing of information. People often rely on cues, taking a peripheral route instead of processing more information on the topic. Taking the peripheral route includes accepting a ‘rule of thumb’, such as the source of information looking like an expert in a white coat. Such cues may change levels of belief, as they can make information, such as physical exercise being good for one’s health, seem ‘more true’. However, more persistent behaviour change is based on the impact on belief of cognitive processing, not peripheral cues.

Understanding how the cognitive processing of communications information (a background factor in the RAA) impacts belief requires analysis of the process by which belief is formed – which is discussed next.

2.3.4.2 Cognition and belief

Individuals process cognition until they meet a sufficiency threshold (Petty and Cacioppo, 1986), when the belief formed meets the current motive. This sufficiency threshold could be met during primary cognition or secondary cognition.

2.3.4.2.1 Primary and secondary cognition

If cognitive ability is limited in some way, perhaps due to the amount of time available or a lack of motivation, heuristic peripheral cues are relied upon intuitively to form belief as processing sufficiency has been met. Rucker, Briñol and Petty (2011) acknowledge that this is the outcome when elaboration likelihood is constrained low during primary cognition, when, for example, the shortage of time may lead to the assumption that an expert must be right without their arguments being processed. Such intuition is defined as “the power or faculty of attaining to direct knowledge or cognition without evident rational thought and inference” (Merriam-Webster, 2024).

Communications messages, such as those within social marketing, can encourage rational thought as primary cognition and secondary cognition when elaboration likelihood is unconstrained (Rucker, Briñol and Petty, 2011). Primary cognition is defined as the primary thoughts an individual associates with an object or behaviour, such as: physical exercise is not important for health as not everyone does it. Secondary cognition sees an individual reflect on primary thoughts to make a cognitive assessment of an existing cognition, possibly amending belief, for example to believe that physical exercise is, on reflection, essential, having read key statistics (Petty and Briñol, 2015).

Communications are often designed to encourage individuals to think more so they change their belief in the intended direction, to influence a change in behaviour. Message content and framing are crucial, as mentioned in section

2.3.2 (Hallahan, 1999; Petty and Cacioppo, 1984). When presented with a message, individuals use primary cognition to compare the message content with existing thoughts on the subject when formed by intuition (Stanovich and West, 2000). The higher the elaboration likelihood on a topic, the more a message can be compared to those thoughts before a judgment is made, motivations for processing information being accuracy, defence (self-definitional beliefs) and impression (social goals) (Chen, Duckworth and Chaiken, 1999).

Secondary cognitions can only occur when a degree of thinking has occurred (Nelson and Narens, 1990; Petty and Briñol, 2015). These self-validations of thought confidence could lead to corrections for bias. They may lead to the same or different outcomes depending on the outcome of the secondary cognition. By excelling in secondary cognition, an individual may be able to partially compensate for any cognitive limitations (Veenman, Wilhelm and Beishuizen, 2004), leading to higher levels of elaboration and improved problem-solving skills (Dignath, Buettner and Langfeldt, 2008). In an expansionist review, Jost, Kruglanski and Nelson (1998) reveal that individuals can use social metacognition to judge the cognition of others, which could be via social media posts or opinion editorials on websites.

However, belief may change more readily when issuing affectively framed messaging (Clarkson, Tormala and Rucker, 2011), as examined in the following sections. 2.3.4.2.2 and 2.3.4.2.3.

2.3.4.2.2 Effect of emotions salient before primary cognition

Making sense of what could otherwise be perceived as contradictory conclusions, Petty and Briñol (2015) discuss the results of numerous studies to explain that emotions have various effects on belief depending firstly on whether they become salient before or after primary cognition, and secondly on whether elaboration likelihood is constrained high, low or is unconstrained.

When emotions precede primary cognition, and when elaboration likelihood is constrained low, emotions influence belief as a simple cue in accordance with their valence (positively with pleasant emotions to make things seem ‘more true’, negatively with unpleasant emotions to make things seem ‘less true’). In contrast, when elaboration is constrained high, emotions can have the same influence on primary cognition as an argument, backing up existing cognitive arguments. For example, fear can help an individual assess the severity of a threat. Emotions can also bias primary cognition when elaboration is constrained high by prompting a more favourable interpretation of message arguments, particularly when the valence of an emotion experienced from an activity matches the valence of message framing (positive, negative) and when the active/passive nature of an emotion matches the activity in the argument presented. For example, getting people to be more physically active may be influenced more by an active emotion (Petty and Briñol, 2015). This thinking stems from the Affect Infusion Model (Forgas, 1995). However, an individual can also remove the bias of the emotions when they are conscious that their judgments are being manipulated in this way. These effects are contained

within the direct connection between affect and belief in the conceptual model in figure 2.8d above.

When elaboration likelihood is unconstrained, emotions can influence the amount of additional cognitive processing that takes place (Petty and Briñol, 2015). Further thinking is possible as elaboration likelihood is not constrained low. According to the Feelings as Information viewpoint (Schwarz, Bless and Bohner, 1991), emotions implying a problematic environment - such as fear - can encourage an individual to think about how to resolve a difficult situation, leading to what Dillard et al. (1996) would call an action tendency, in this case protection or withdrawing from a stimulus. In contrast, emotions implying safety - such as happiness - can discourage the need for further elaboration as an individual is comfortable with the way things are. This again aligns with Dillard et al.'s (1996) action tendencies, the emotion happiness encouraging an individual to continue towards a goal without changing current behaviour.

However, when examining the effects of emotions on unconstrained elaboration, many studies have produced contradictory results. Moons and Mackie (2007) find that anger can increase information processing, while Tiedens and Linton (2001) find the opposite.

To resolve such conflicts, Petty and Briñol (2015) propose the Differential Appraisals Hypothesis. This hypothesis predicts that individuals use emotions differently when deciding whether to process more information, depending on

whether they use an emotion to make a cognitive appraisal (based on the level of certainty associated with the emotion) or affective appraisal (based on the pleasantness of the emotion). For example, anger is a certain emotion (Smith and Ellsworth, 1985) and encourages a sense that existing views are accurate, hence further elaboration is not needed. In contrast, individuals favouring an affectively based appraisal will focus on the pleasantness of the emotion – and as anger is unpleasant it may instead encourage further elaboration, as individuals may feel less comfortable with their existing views. These cognitive and affective appraisals explain why Dillard et al.'s (1996) action tendencies are too simplistic.

The Differential Appraisals Hypothesis should not be confused with the series of cognitive appraisals that takes place when an emotions is formed: initial cognitive activity, primary appraisal, secondary appraisal (Smith and Lazarus, 1990). Once formed by the cognitive appraisal of a topic, an emotion is itself appraised, either cognitively or affectively possibly leading to further cognitive activity as described above. For example, an individual may have initial cognitive activity relating to an individual's understanding of what physical exercise is. The primary and secondary cognitive appraisals may lead to fear based around the likely health issues associated with not engaging in physical exercise of any sort. According to the Differential Appraisals Hypothesis, an individual experiencing fear is likely to engage in further cognitive processing regardless of whether they make a cognitive appraisal (based on uncertainty) or affective appraisal (based on unpleasantness). This may lead to primary cognition and the belief that exercise is not important for one's health as not

everyone does it. This assumes that elaboration likelihood is not constrained low, in which case further cognition would not take place.

Neither should the Differential Appraisals Hypothesis be confused with the cognitive or affective validation that occurs during secondary cognition, which is described in the following section.

2.3.4.2.3 Effect of emotions salient after primary cognition

Smith and Kirby (2000) noted that sometimes emotions are experienced following reasoning. When emotions become salient after primary cognition has taken place and during secondary cognition, their impact can take two forms: cognitive validation of thought or affective validation of thought (Petty and Briñol, 2015). With cognitive validation, the certainty or uncertainty associated with an emotion is applied to someone's thoughts, strengthening or weakening reliance on those thoughts. With affective validation, the valence of an emotion is instead applied, with the individual's liking or dislike of their thoughts impacting on the reliance on thoughts. As happiness is certain and positive, both forms of validation relate to the view that happiness can encourage an individual to proceed to goal attainment. Cognitive validation will dominate when an individual has a cognitive mindset, although it is not specified at what level of unconstrained elaboration an affective mindset becomes a cognitive mindset.

2.3.4.2.4 Criticism of Petty and Briñol's (2015) model

Although successful at explaining contradictions, Petty and Briñol's (2015) model is incomplete. Firstly, it does not take mood into account. Rucker, Briñol and Petty (2011) note that some variables, such as mood, may have little effect on primary cognition and a large effect on secondary cognition, or vice versa, depending on circumstances. For example, a positive mood may have a larger effect on primary cognition when arguments are ambiguous, but a larger effect on secondary cognition when arguments are strong (positive effect) or weak (negative effect). In addition, mood may lead to higher levels of elaboration when elaboration is not constrained high or low to preserve a positive state and may serve as a cue when elaboration is constrained low.

The model also neglects to affirm that emotions can have more than one effect on an individual. For example, fear could have a negative effect on affective attitude, while simultaneously having a positive effect on belief when making a cognitive appraisal during primary cognition (Petty and Briñol, 2015). To date, no studies have compared the total effects of social marketing messages on attitude and behaviour at different levels of elaboration using the RAA framework. Hence this PhD study has investigated these total effects' contribution to a framework predicting and changing human social behaviour.

In summary of sections 2.3.4.2.2 to 2.3.4.2.4, the impact of social marketing messaging on cognition and belief depends on whether an individual is

engaging in primary cognition or secondary cognition, and on the level of elaboration likelihood.

Despite these considerations, belief precedes attitude in the RAA, hence hypotheses H9a and H9b predict that, following the persuasion appeal, there are statistically significant and meaningful relationships between belief and attitude. As the variables in the RAA have cognitive and affective aspects, belief is hypothesised to be a predictor of both cognitive and affective attitude.

H9a Belief positively influences cognitive attitude

H9b Belief positively influences affective attitude

Although it is essential to understand the mechanisms that influence OPRs, affect and belief when selecting message content and framing, the key to maximising persuasiveness lies in the nature of individuals' existing attitude (Teeny et al., 2021). This will lead the social marketing practitioner to the optimal choice of message frame (cognitive/affective, positive/negative), as explored in the following section.

2.3.5 Attitude

Attitude is shown in the conceptual model in figure 2.8d on page 122 above as being influenced by belief, affect and OPR, and is shown to predict behavioural intention. Eagly and Chaiken (1993:1) provide an umbrella definition of attitude as "a psychological tendency that is expressed by evaluating a particular entity with some degree of favour or disfavour". This definition encompasses three essential features: (1) a psychological tendency (2) to evaluate (3) an attitude object (Eagly and Chaiken, 2007). “Contemporary researchers have come to view an attitude as a relatively general and enduring evaluation people have regarding people (including oneself), places, objects, and issues” (Briñol, Petty and Guyer, 2019:2). However, attitudes held with certainty are more likely to be durable over time (Tormala and Rucker, 2007, 2018). Attitudes are formed when a person responds evaluatively to a stimulus or attitude object in three ways: affectively, cognitively, behaviourally (Rosenberg and Hovland’s, 1960; Eagly and Chaiken, 2007).

This section 2.3.5 is structured as follows. As there are cognitive and affective components of attitude (Breckler, 1984), these variables are examined individually, followed by an investigation of cognitive-affective matching effects, which explain that an individual’s initial attitude can dictate why some message frames are more successful than others in influencing belief and affect, and hence attitude. Behaviour is covered in section 2.3.6.

2.3.5.1 Cognitive attitude is predicted by belief and cognitive trust

Changing attitudes means changing the variables which predict attitude in the conceptual model. Within the RAA, attitude is predicted by belief (Fishbein and Ajzen, 2010) hence cognitive attitude is predicted by belief in figure 2.8d on page 122. Starting from Festinger's (1950) postulate that "people are motivated to hold correct attitudes" (Petty and Cacioppo, 1986:127), the ELM found cognitive message frames to be more effective methods of persuasion than affective. Indeed, in some situations, cognitive attitude is likely to be more dominant than affective attitude, perhaps because individuals have high elaboration likelihood. van Giesen et al. (2015) found that cognition can have a higher influence on overall attitude for individuals with a high need for cognition.

Cognitive attitude is also predicted by the three cognitive trust dimensions in figure 2.8d. Bruning and Ledingham (1998), for example, find that the cognitive aspects of trust and commitment significantly impact attitude (customer satisfaction in this case). Cognitive attitude's dominance within persuasion may therefore be partially explained by a strong relationship between cognitive trust and cognitive attitude.

Affective attitude can also play an important role within persuasion, though, as explained in the next section.

2.3.5.2 Affective attitude is predicted by belief, affect, affective trust

The models by Smith and Lazarus (1990) and Dillard et al. (1996) show that affective attitude is predicted by the experiencing of affect. As the variables in the RAA have cognitive and affective aspects, belief is also a predictor of affective attitude.

Other variables also have a direct or indirect influence on affective attitude. Jones (1996) finds a link between affective trust and affective attitude. Studies focusing on OPRs within public relations literature do not measure affective trust though and so the impact of affective trust on affective attitude has not been tested within public relations literature and remains a research gap. In other areas of research, cognitive trust has been found to have unique consequences compared to affective trust, while also having a positive relationship with affective trust, thereby also indirectly influencing affective attitude (McAllister, 1995), another unexplored research gap within public relations literature. These research gaps are investigated within this PhD study as hypotheses H1a to H4b, as shown in section 2.1.3.1.1 on pages 52-53.

Interestingly, affective attitude can particularly be influenced indirectly by individuals' initial levels of belief prior to a persuasive appeal. In a study of ethical behaviour, Lee and Selart (2014) conclude that individuals who live or do not live up to the standards of their initial beliefs may feel emotions such as guilt, shame or pride. These emotions then influence affective attitude towards

an object. The role of affect will perhaps be even greater for those individuals possessing what Maio and Esses (2001) call a high need for affect.

Having examined cognitive and effective attitude, the following section will now review the circumstances in which these variables can be influenced via cognitive-affective matching effects within social marketing.

2.3.5.3 Cognitive-affective matching effects

Research has proven that an individual's existing attitude influences the effectiveness of persuasive communications, hence it can improve effectiveness to engage in personalised messaging and targeting (Teeny et al., 2021) at the level of the individual (Latimer, Saloney and Rothman, 2007). Matching to attitude base is one of many matching effects recorded by Teeny et al. (2021). The effect of matching effects on belief is explained within the ELM at three levels of elaboration:

- Elaboration likelihood constrained low - cue effect
- Elaboration likelihood constrained high - biases thinking, or additional argument
- Elaboration likelihood unconstrained - encourages elaboration

Within the literature, two hypotheses have been identified regarding attitude bases: the amplification hypothesis and the crystallisation hypothesis.

2.3.5.3.1 Amplification hypothesis

Clarkson, Tormala and Rucker (2011) conclude that communications strategies should be chosen according to whether an individual's existing attitudes are cognitive or affective, and whether they are held with certainty or uncertainty. To give a guide to classifying affective attitudes as either certain or uncertain, Smith and Ellsworth (1985) find that happiness, pride, interest, guilt, boredom, contempt, disgust and anger are emotions held with certainty; surprise, hope, shame, fear frustration and sadness are emotions held with uncertainty. When attitudes are certain, the cognitive/affective nature of the communications must match the original attitude base for best attitude change results (cognitive for a cognitive attitude, affective for an affective attitude). This hypothesis is explained by an amplification effect that develops from attitudes characterised by ambivalence, moderation or low attitude accessibility being more malleable. That is, attitude certainty makes attitudes characterised by univalence more resistant to change, but attitudes characterised by ambivalence less resistant to change, amplifying the effect of the persuasive communications.

When attitudes are uncertain, though, a mismatch effect occurs (cognitive are the most effective for an affective attitude, affective are the most effective for a cognitive attitude). The mismatch effect created by uncertain attitudes requires further research to explain, according to Clarkson, Tormala and Rucker (2011) and remains a research gap worthy of investigation to inform social marketing campaigns strategies for predicting and changing human social behaviour.

As the level of attitude certainty affects the relationships between variables in the conceptual model, attitude certainty is shown as having a moderating effect in the updated version of the conceptual model in figure 2.8e below on the following page. The relationships between emotions and attitude, and belief and attitude, are influenced, due to the effects of the amplification hypothesis. When message frame and elaboration likelihood are held constant, attitude certainty will influence these two relationships. For example, when an individual with a cognitive attitude and unconstrained elaboration likelihood experiences a cognitive message frame, they are likely to be more easily persuaded when attitudes are certain. This is because the relationship between belief and attitude is stronger due to attitude certainty affecting attitude's resistance to attack (Clarkson, Tormala and Rucker, 2011).

Attitude certainty has also been found to moderate the relationships between attitude and behaviour and subjective norm and behaviour (Tormala and Rucker, 2007, 2018; Kokkinaki, 2009). Hence these two moderation effects are included in figure 2.8e.

Three hypotheses in this PhD study test the moderating effects of attitude certainty, focusing on the moderation of the relationships between the predictors of behavioural intention (attitude, subjective norm, self-efficacy) and behavioural intention, to help explain the reasons for differing results in four clusters of data:

H10a When attitude certainty is high, the relationship between attitude and behavioural intention is stronger than when it is low

H10b When attitude certainty is high, the relationship between subjective norm and behavioural intention is stronger than when it is low

H10c When attitude certainty is high, the relationship between self-efficacy and behavioural intention is stronger than when it is low

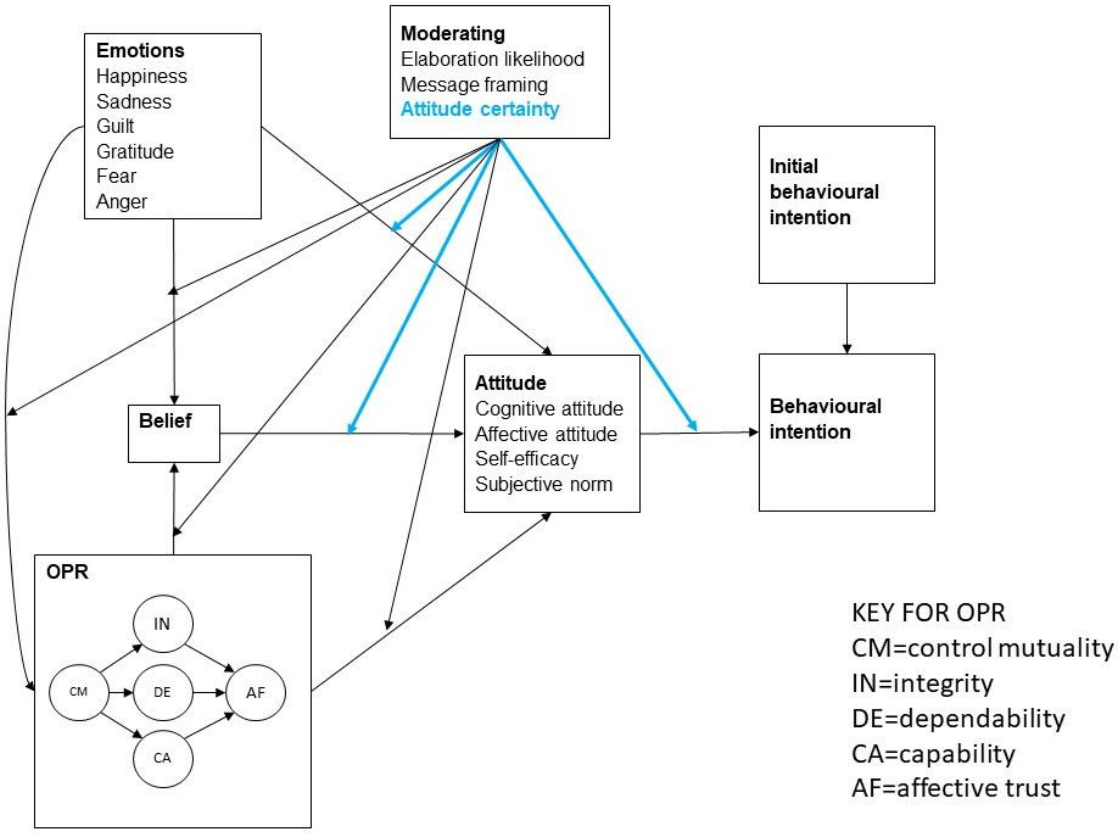


Figure 2.8e: Conceptual model expanded to include the moderating variable attitude certainty.

New elements are marked in blue.

2.3.5.3.2 Crystallisation hypothesis

Ryffel and Wirth (2016) find that increased levels of processing fluency decrease the likelihood of message processing, reversing the matching effects just described. That is, for individuals with cognitive attitudes with high levels of processing fluency, affective communications are the most effective. For individuals with affective attitudes with high levels of processing fluency, cognitive communications are the most effective. When an individual is familiar with a topic, peripheral processing results, perhaps backing up existing belief on a topic. This is due to the crystallisation hypothesis, when certain attitudes act as a crystallising agent, making attitudes characterised by univalence, extremity or high attitude accessibility less malleable. Heightened message scrutiny and central processing can occur though when a mismatched appeal is strong; for example, when an individual with a cognitive attitude experiences a strong affective message leading to a higher level of attitude change.

2.3.5.3.3 Criticism of matching effects literature

Five observations can be made regarding matching effects literature. Firstly, regarding the crystallisation and amplification hypotheses, it is not appreciated that elaboration likelihood can remain high for various reasons, including when elaboration is constrained high, which could affect the effectiveness of affective frames (Rucker and Petty, 2006). Indeed, Clarkson, Tormala and Rucker (2011) underline an interesting research gap, noting that the amplification and crystalisation effects should be tested using the ELM, to further inform theory and practice for the prediction and changing of human social behaviour.

Secondly, neither Clarkson, Tormala and Rucker (2011) nor Ryffel and Wirth (2016) explain that attitude certainty can be strengthened by such factors as directly experiencing a product, message repetition and subjective ease (that is, ease of processing) to effectively convert an uncertain attitude to a certain attitude (Tormala and Rucker, 2007). Interestingly, adopting this strategy, to turn an uncertain attitude to a certain attitude, may make an individual more responsive to a matched cognitive frame prior to the point of high processing fluency assuming they do not have elaboration constrained low. Strengthening attitude certainty is another strategic option for a campaign.

Thirdly, neither Clarkson, Tormala and Rucker's (2011) nor Ryffel and Wirth's (2016) study recognises that an affective message can take many forms depending on the emotion, or emotions, being induced. It may be that affect is only the most effective strategy when a positive, or negative, emotion is experienced, due to, for example, cognitive/affective appraisals during primary cognition (Petty and Briñol, 2015). Testing cognitive/affective matching effects with various message frames is another research gap that would inform strategies predicting and changing human social behaviour.

Fourthly, matching effects literature does not generally use the RAA framework of variables, focusing on the evaluation of attitude but not on the evaluations of subjective norm and self-efficacy and the influences of these variables.

Finally, while Teeny et al. (2021) fully incorporate matching effects into the ELM at three levels of elaboration - low (cue effect), high (biases thinking, or additional argument) and unconstrained (encourages elaboration) - the study does not accommodate mismatching effects via the crystallisation and amplification hypotheses.

Uniquely, this PhD study proposes a summary of studies' matching and mismatching results in table 2.3 with reference to elaboration likelihood. This table displays the various combinations of most effective message, based on attitude base (cognitive or affective), attitude certainty (certain or uncertain), elaboration likelihood (constrained high, unconstrained, constrained low) and processing fluency (low for the amplification effect, high for the crystallisation effect). For example, when an individual has a certain cognitive attitude with unconstrained elaboration likelihood and low processing fluency, it is likely that a matching cognitive message will have the greatest persuasion effect (cell shaded green in table 2.5). This is because of high malleability of an attitude due to, for example, low attitude accessibility, leading to low processing fluency. Giving a second example, an individual with a certain cognitive attitude with unconstrained elaboration but high processing fluency would be more influenced by an affective message (cell shaded blue in table 2.5). This is because a cognitive message would take a peripheral route due to processing sufficiency having been reached. The individual would be more persuaded by an affective message frame, according to matching effects theory.

Existing dominant attitude (cognitive/affective)	Elaboration likelihood	Most effective message frame	
		Low processing fluency	High processing fluency
Cognitive certain	HIGH	Cognitive	Cognitive
	Unconstrained	**Match:** Cognitive	**Mismatch:** Affective
	LOW	Affective	Affective
Cognitive uncertain	HIGH	Cognitive	Impossible
	Unconstrained	**Mismatch:** Affective	Impossible
	LOW	Affective	Impossible
Affective certain	HIGH	Impossible	Impossible
	Unconstrained	**Match:** Affective	**Mismatch:** Cognitive
	LOW	Affective	Affective
Affective uncertain	HIGH	Impossible	Impossible
	Unconstrained	**Mismatch:** Cognitive	Impossible
	LOW	Affective	Impossible

Table 2.3: The most effective message frame for attitude change in relation to existing attitude and elaboration likelihood. Compiled using Ryffel and Wirth (2016), Clarkson, Tormala and Rucker (2011), Petty and Briñol (2015), Teeny et al. (2021).

Three points must be listed when reading the table:

- The most effective message is always deemed to be cognitive when elaboration is constrained high (when attitudes are generally cognitive) regardless of attitude certainty or processing fluency (Teeny et al., 2021). Extra persuasiveness is gained from the matching effect acting as an additional argument or bias.
- The most effective message is deemed to be affective when elaboration is constrained low (when attitudes are generally affective), regardless of attitude certainty or processing fluency (Teeny et al., 2021). Extra persuasiveness is gained from the matching effect acting as a heuristic peripheral cue.
- Some combinations in the table are deemed impossible, such as having an uncertain attitude when processing fluency is high.

In summary of section 2.3.5, cognitive attitude is predicted by belief and cognitive trust, while affective attitude is predicted by belief and affect, in the conceptual model. Public relations literature has not incorporated the connections between OPRs and affective attitude. Selecting the most effective message frame means taking existing attitude bases (cognitive/affective) into account as well as an individual's level of elaboration likelihood and attitude certainty, due to matching effects and the effects of the crystallisation and amplification hypotheses.

The focus of this literature review of persuasion now moves to behavioural intention and behaviour.

2.3.6 Behaviour

Sometimes referred to as conative attitude, behaviour is shown in one rectangle on the far right in the RAA (figure 2.7 on page 96) (Fishbein and Ajzen, 2010) although it can be divided into instrumental behaviour (actions undertaken as a way of meeting a goal, such as taking a train to work) and consummatory behaviour (actions undertaken for their own sake, such as eating and drinking or buying a consumer good) (Millar and Tesser, 1990). Behavioural intention mediates between attitude and behaviour in the RAA (Fishbein and Ajzen, 2010; O'Neil and Eisenmann, 2017; Knoll and Jörg, 2017).

Section 2.3.6 is structured as follows. Firstly, a focus on variables that predict behaviour, including behavioural intention, finds that targeting attitude may not always be the best way to influence behaviour and behavioural intention. Then it is seen that maximising attitude certainty can be an important objective. A conclusion to this review of persuasion literature follows.

2.3.6.1 Attitude is not the only predictor of behavioural intention

Many variables influence behaviour and behavioural intention, hence a message aiming to change attitudes may not lead to behaviour change, if the connection between attitude and behaviour is not very strong. Behavioural intention, in the conceptual model in figure 2.8e on page 138, is influenced by cognitive attitude and affective attitude, which mediate between OPR and behaviour: Kim and Chan-Olmsted (2005) found a strong correlation between

brand attitude and purchase intention; Ki and Hon (2007a) found that positive attitudes predicted supportive behavioural intention towards a university. However, in the RAA, behavioural intention is also influenced by two other attitudinal variables: (1) perceived subjective norm (what others are doing, what should be done) as well as (2) perceived behavioural controls or self-efficacy (perceived ability to perform a behaviour) (Fishbein and Ajzen, 2010). A social marketer must be mindful of the attitudinal variable with the strongest connection to behavioural intention to make the best impact. If this is the variables the RAA calls attitude towards a behaviour, there is potential for OPR to play a role in behaviour change, as OPR dimensions predict attitude. Behaviour can also be predicted by variables other than behavioural intention, as discussed next. In this PhD study, behavioural intention is also predicted by initial behavioural intention as a control variable, as discussed in section 2.3.1.1.1 on page 100 (Hagger, Polet and Lintunen, 2018). There is also recognition that behavioural intention is predicted by extraneous variables not included in the RAA (Armitage and Conner, 2001).

2.3.6.2 Behavioural intention is not the only predictor of behaviour

Despite the popularity of Rosenberg and Hovland's (1960) Tripartite Model of Attitude, behaviour may be influenced by variables other than behavioural intention, including a host of extraneous variables not included in the RAA. For example, Gallagher and Updegraff (2012) conclude that framing has no effect on attitude or behavioural intention for bad health prevention behaviours (such as stopping smoking) within health communications, although gain-framing

does influence the variable behaviour. Other variables could be techniques from nudge theory to give individuals encouragement to undertake a behaviour or complete tasks (Handel, 2015): these include default options (such as the tick already in place for signing up for an online newsletter), shaping the environment (such as the positioning of healthy snacks in a shop) and earmarking (for example, encouraging certain activities occur daily). However, to maximise behaviour change a social marketer ideally needs to maximise attitude certainty, as explored in the following section.

2.3.6.3 Certain attitudes as a marketing communications goal

The relationship between attitude and behaviour can be strengthened by higher levels of attitude certainty (Tormala and Rucker, 2007, 2018) particularly when ambivalence is low. Low ambivalence is associated with the crystallisation hypothesis (Clarkson, Tormala and Rucker, 2011). Attitude certainty can be strengthened by such factors as directly experiencing a product, message repetition and subjective ease (that is, ease of processing) to effectively convert an uncertain attitude to a certain attitude (Tormala and Rucker, 2007). To maximise impact, a social marketing campaign should also aim at improving individuals' attitude certainty (Rucker and Petty, 2006).

In summary of section 2.3.6, and with reference to the connections in figure 2.8e on page 138, communicators must be aware of the best overall message for behaviour change, as behavioural intention is predicted by cognitive and

affective attitude, subjective norm, self-efficacy and extraneous variables; while behaviour is predicted by behavioural intention and other extraneous variables. Stronger connections between attitude and behaviour occur when attitudes are certain, making improving attitude certainty a key campaign objective. This underlines why attitude certainty is included as a third moderating variable. This summary leads to this PhD research study's first two research questions:

RQ1: What are the key constructs in a structural model representing a social marketing campaign focusing on physical exercise?

RQ2: Are there significant differences between groups defined by elaboration likelihood, attitude certainty and message framing, in a structural model representing a social marketing campaign focusing on physical exercise?

The summary also leads to further hypotheses. H11a, H11b, H11c and H11d predict that, following the persuasion appeal, there are statistically significant and meaningful relationships between behavioural intention and its predictors.

H11a Subjective norm positively influences new behavioural intention

H11b Self-efficacy positively influences new behavioural intention

H11c Attitude positively influences new behavioural intention

H11d Initial behavioural intention positively influences new behavioural intention

2.3.7 Conclusion

Reviewing persuasion literature has shown that different message frames will have different results on the variables in the conceptual model in figure 2.8e on page 138, which brings together the RAA, ELM and OPR. These differing results will affect the relative persuasiveness of OPR, belief and affect on behavioural intention.

Social marketers will be interested in the most effective message frame. The first step to selecting the best message frame is isolating an individual's existing attitude, as this dictates whether an affective or cognitive message will, ultimately, have the most impact on attitude, due to matching and mismatching effects. They are driven by attitude certainty and processing fluency when elaboration likelihood is unconstrained. When elaboration is constrained high, matching effects may act as a bias or an additional argument.

The second step is therefore understanding whether an individual's elaboration is constrained low, constrained high or is unconstrained, as elaboration likelihood effects the performance of other variables. If elaboration likelihood is constrained low, simple messaging and cues may be effective alongside emotional appeals using happiness. If it is constrained high, there is a strong appetite for more information. When elaboration likelihood is high, an individual could use the information to correct bias or validate previous thinking during secondary cognition, although framing itself may not influence persuasiveness. If elaboration likelihood is unconstrained, effective cognitive messaging

perhaps with a repetition strategy, or affective messaging based on uncertain emotions such as fear, may encourage further elaboration, perhaps due to unexpected framing, depending on an individuals' circumstances and existing attitude base.

There are many things to consider to make messaging successful. When selecting the most appropriate message, the success of a cognitive message depends on things such as argument strength and message frame (positive/negative), to influence belief, cognitive attitude and affective attitude. However, it is likely that individuals already believe that physical exercise is good for them as it is such a simple topic, perhaps making an affective message frame potentially more successful.

When an affective message is the most appropriate, its success typically depends on how the experiencing of a discrete emotion, formed by cognitive appraisal following a communication, influences belief, affective trust and affective attitude. Belief can itself be based on primary cognition or secondary cognition depending on an individuals' processing sufficiency. Following cognitive appraisal, the resulting emotion may or may not impact elaboration and belief, depending on the properties of the emotion and levels of elaboration likelihood. Even if belief is influenced, an emotion could simultaneously have positive and negative effects on attitude and behaviour along various routes. Emotions must therefore be chosen carefully to be effective.

Indeed, messages can influence both belief and affect, and the variables they influence, simultaneously along different routes. For example, happiness could positively influence affective attitude as a cue effect, while fear simultaneously negatively impacts belief during secondary cognition, as shown in the conceptual model in figure 2.8e. With variables influenced by so many factors, a social marketer would be wise to model and calculate the influence of messages on these variables and hence on individuals' behaviour.

There are two other important conclusions. Firstly, the effects of cognitive and affective messages could be boosted by OPRs via three connections: the connections between (1) control mutuality and belief; (2) cognitive trust and cognitive attitude; (3) affective trust and affective attitude. Importantly, an OPR is required for corrective action, as information must be received, reviewed, repeated and examined, preferably down a central not peripheral route, for corrective action to be taken.

Secondly, social marketers must be aware that a certain attitude is more enduring. High attitude certainty could be seen as an additional objective for persuasion campaigns.

The next section complements the reviews of OPRs, social marketing and persuasion with a review of health communications literature.

2.4 Health communications

It is important to review the health communications literature, to determine how concepts and theories explored in previous sections are best applied to public health social marketing. This literature review is structured as follows. Sections on cognitive and affective message framing find that the impact of health communications messaging is dependent on individuals' attitude to risk within a particular health context, as well as other variables at the level of the individual, such as affect, elaboration likelihood and attitude certainty. Analysing the relationship between affect and cognitive response for simple public service announcements shows that, situationally, individuals are likely to be in one of four clusters, when high and low elaboration likelihood and attitude certainty are considered. A final section examines the relationship between affective attitude and behaviour within health communications, finding that, for physical exercise, behavioural intention mediates fully between attitude and behaviour, meaning that behaviour is unessential as a variable of interest within this PhD research study.

2.4.1 Health communications messaging

This section focuses on the effects of cognitive message framing within health communications. It then examines the impact of affective messaging and the possibility of experiencing multiple affects. It concludes by considering how the relationship between affect and cognition affects campaign effectiveness within health communications.

2.4.1.1 Cognitive message framing

When researching message framing effects, many studies have chosen to focus on health communications, to see how framing influences behavioural intention, attitude or behaviour (Hallahan, 1999). Of the seven types of framing categorised by Hallahan (1999), cognitive messaging containing risky choice framing (situations describing gain versus loss) and actions framing (positive versus negative information) have been studied the most frequently within health communications (O'Keefe and Jensen, 2007).

There have been conflicting results from studies. While O'Keefe and Jensen (2006, 2007, 2008) conclude that there is no substantively meaningful main effect for framing, various studies have found significant relationships between framing and dependent variables (attitude, behavioural intention, behaviour) within specific contexts and optimal conditions (Rothman and Salovey, 1997; Frisch, 1993; Reyna and Brainerd, 1991). Looking at the framing of health

messaging in general via a meta-analysis of 94 studies, Gallagher and Updegraff (2012) find that gain-framed messaging has a statistically significant effect on behaviour. Despite Prospect Theory predicting that individuals will take a risk to avoid loss and will avoid risk to accept a gain (Kahneman and Tversky, 1979), loss-framed messages in Gallagher and Updegraff's (2012) study do not predict illness-detection behaviours (such as the risky behaviour of having a cancer scan). Such contradictions are investigated and explained in the following section.

2.4.1.1.1 Framing when no risk associated with health behaviour

Rothman and Salovey (1997) make sense of contradictory results by concluding that the effectiveness of framing depends on individuals' perceptions of the risk associated with a particular health behaviour. This is illustrated well in studies on organ donation (Reinhart et al., 2007), when there is a general perception of no risk, due to organ donation affecting others, not oneself.

Reinhart et al. (2007) find that gain-framed messaging has the biggest effect on attitudes to the topic, as organ donation is not a personal matter and there is no perceived risk in joining a register of donors; people are avoiding risk and accepting a gain. Interestingly, Sun (2014) also discovers that positive messaging has a significant effect on attitude. Rothman and Salovey (1997) and Gallagher and Updegraff (2012) found that gain-framed messaging had a

significant effect on behaviour when considering illness-prevention behaviours, which are also generally considered to be risk-free, such as using sunscreen or doing physical exercise, as individuals prefer more certain options when presented with gain-framed information. However, Sun (2014) also discovers that when the combined effect of positive/negative and emotional/rational messaging is considered, it is negative emotional messaging that has a significant effect on behavioural intention for organ donation. Chien and Chang (2015) conclude that loss-framed messaging coupled with an exemplar (for example, a case study or anecdote) has the biggest effect on behavioural intention (that is, intentions to join a donation register), although Kopfman et al. (1998) found that behavioural intention effects can fade after just a few days.

However, other factors can affect message effectiveness. Loss/gain framing may also have very little effect for individuals with a very positive attitude to organ donation (Reinhart et al., 2007). Perhaps this is because elaboration likelihood is high enough for framing to be irrelevant as a motivation to process information (Petty and Cacioppo, 1986). Alternatively, it could be because attitudes to organ donation are certain and are not malleable or open to change (Clarkson, Tormala and Rucker, 2011). Hence it is important to consider the level of the individual, not just the level of the behaviour, when forming messaging, as discussed next.

2.4.1.1.2 Health message-framing at the level of the individual

Many studies have underlined that messages can be effective when framed at the level of the individual, not the level of the behaviour type (Latimer, Saloney and Rothman, 2007). Indeed, it is often a mistake to assume that a full set of data represents a single, homogenous population as the moderation effects of variables can play a role (Hair et al., 2017). When Bartels, Kelly and Rothman (2009) examined illness-prevention messages for encouraging vaccination against a virus, individuals who were more confident about the effectiveness of the vaccine were more easily persuaded by gain-framed messaging, while individuals who were less confident about the effectiveness of the vaccine were more easily persuaded by loss-framed messaging. When failing to consider the level of the individual, studies and reviews find little consensus for the best message frames within health communications promoting physical exercise. Williams et al.'s (2019) review of 13 studies finds that gain-framed messages alone are most effective, when compared to loss-framed messages, in influencing physical activity behaviour. But the results can change when factors at the individual level are included, such as source credibility, need for cognition, responses to message affect, number of arguments and intrinsic outcomes (enjoyment, satisfaction) versus extrinsic outcomes (health, appearance). For example, Gallagher and Updegraff (2011) find that extrinsic/gain-framed and intrinsic/loss messages are most effective for those with a high need for cognition, while intrinsic/gain-framed and extrinsic/loss-framed messages are most effective for those with low need for cognition. Taking a different approach, McCormick and McElroy (2009) conclude that the highest level of behavioural intention for exercise arises with a gain-framed

message with six arguments and a negative background picture. These experiments assume though that individuals are motivated to process more information on a health topic (Petty and Cacioppo, 1986).

The studies within Williams et al.'s (2019) review may have found more agreement had they taken elaboration likelihood (Petty and Cacioppo, 1986) and existing attitude base (Clarkson, Tormala and Rucker, 2011; Ryffel and Wirth, 2016) into consideration, as they operate at the level of the individual. For example, elaboration likelihood constrained high may account for Reinhart et al.'s (2007) finding that loss/gain framing has little effect when individuals have a very positive attitude to organ donation, as individuals are highly motivated to process information on the topic regardless of framing. The level of the individual could also include responses to affect and OPR dimensions such as control mutuality and trust. Such factors are now considered, beginning with how affect - often highly effective within public health communications particularly when individuals have low elaboration likelihood (Petty and Cacioppo, 1986) - influences individuals differently.

2.4.1.2 Affective health message-framing

Although health prevention messages can be positively or negatively framed, affective message frames will have different results depending on the emotions experienced by individuals. This is because message framing has a moderating effect on relationships in the conceptual model in figure 2.8e on page 138, such

as between fear and attitude or between fear and belief. Affective health message framing is discussed in the following paragraphs, focusing firstly on the persuasiveness of fear.

2.4.1.2.1 Fear appeals at the level of the individual

Research studies focusing on fear messaging within heath communications have found that fear can sometimes lead to positive results. When investigating patterns of cognitive appraisal in emotion, Smith and Ellsworth (1985) list fear as one of nine negatively framed emotions, describing it as an uncertain emotion controlled by a situation, not other humans. It has long since been accepted by researchers that focusing on fear can have a persuasive effect on behaviour (Boster and Mongeau, 1984; Mongeau, 1998; Sutton, 1982). Fear brings about the action tendency to withdraw from the subject of the stimulus for protection (Dillard et al., 1996). Fear could though influence an individual in four ways, as introduced in section 2.3.4.2.2 on pages 126-129. Fear could:

(1) increase elaboration during primary cognition when elaboration likelihood is unconstrained - so that the individual thinks of a way to solve the problem and remove the fear;

(2) validate existing thinking as secondary cognition, to support current negative thoughts on drug-taking, for example;

(3) act as an argument or bias when elaboration is constrained high, to back up existing problem-solving arguments on a topic;

(4) when elaboration likelihood is low or constrained low, fear could have a negative effect on branding and long-term message persuasiveness, if an organisation becomes associated with images or concepts that are seen as offensive (Hastings and Domegan, 2014; Petty and Briñol, 2015).

Fear must therefore be used strategically and competently bearing in mind the level of the individual.

2.4.1.2.2 Other emotional appeals at the level of the individual

Individuals may actually be persuaded by other emotions following a fear appeal depending on their personalities. When analysing the outcomes of Aids public service announcements (PSAs), Dillard et al. (1996) found that fear increased message persuasiveness for 19 of the 31 fear-focused PSAs shown to participants but not all of them, even though they were all classified as fear appeals. Looking at Dillard et al.'s (1996) findings, for some people the most persuasive emotions were actually surprise or sadness, following a negatively framed message. That individuals may or may not be persuaded by fear points again at delivering communications at the level of the individual (Latimer, Saloney and Rothman, 2007) focusing on the emotions that will persuade an individual most.

If sadness, which has the action tendency to withdraw (Dillard et al. 1996), is instead aroused by a negatively framed message, the results will differ from those associated with fear, according to Petty and Briñol (2015):

1) Sadness does not tend to lead to increased levels of cognition during primary cognition
2) Neither does it validate existing thinking as secondary cognition, to support current negative thoughts on drug-taking for example
3) As a passive emotion it does not act as an additional argument when elaboration is constrained high

Positively framed messages can also have differing effects on individuals.

- Happiness could have a positive effect on branding when elaboration likelihood is low and could bias cognition and serve as an additional argument during primary cognition when elaboration likelihood is constrained high. It could also validate existing thinking during secondary cognition. However, as a certain emotion it will not lead to further cognition during primary cognition.

- Gratitude differs slightly from happiness in that as an uncertain emotion it could lead to further cognition during primary cognition, although it is less likely to validate existing thinking during secondary cognition.

Fear and most other emotions are rarely experienced on their own though, as investigated in the next section.

2.4.1.2.3 Multiple affect may strengthen secondary cognition

It is unlikely that an individual will experience only a single emotion when processing a message frame (Plutchik, 1980). Dillard et al. (1996) found that fear was not the only emotion experienced in their study of fear-based public service announcements (PSAs): only one of 31 PSAs induced one affect, with six resulting in two, 16 resulting in three, six resulting in four, and two resulting in five affects; in fact, 97 per cent of PSAs brought about a change in two or more emotions. There was considerable covariation between these emotions: happiness decreased compared to initial levels following the playing of all 31 PSAs, anger increased for one PSA and decreased for another, surprise increased for four PSAs and decreased for three, sadness increased for eight PSAs and decreased for 13, and puzzlement decreased for 25 PSAs. Statistically significant relationships existed between most of the emotions although happiness was found to be independent of surprise, puzzlement and anger.

Despite being experienced together, not all emotions lead to persuasiveness. Within Dillard et al. (1996) there are only statistically significant positive relationships between three emotions and message persuasiveness: fear, surprise and sadness. Both puzzlement and anger had a weak but statistically significant negative relationship with message persuasiveness. Dillard et al. (1996) conclude that communicators must understand that the positive and negative effects of some emotions could overall have little effect on persuasiveness; hence campaigns should focus on the co-existing emotions

that add to message persuasiveness. Despite these interesting results, the study had limitations as it only focused on negatively framed Aids campaign messaging.

Multiple emotions are again experienced by participants exposed to eight PSAs in Dillard and Peck (2001), which used positive as well as negative messaging. Not all of the PSAs were Aids-related or even health-related. Of the health-related PSAs, a humorous video promoting healthy exercise named *Get Off It* saw only one of the six emotions that were being tested - happiness - having a statistically significant relationship with the variable perceived effectiveness. An anti-drugs PSA named *Drug Dealer* found a relationship between two of the emotions and perceived effectiveness: fear and anger. In this study an Aids awareness PSA called *Get High* had just one emotion - fear - affecting perceived effectiveness. Notably, the largest effect of all three health PSAs was for the emotion happiness within *Get Off It*, supporting the case for considering positively framed messages for some stakeholders. The results also illustrated how the positive and negative effects of fear and anger offset each other somewhat within the *Drug Dealer* PSA.

Neither study attempts a thorough interpretation of how emotions are influencing an individual. To facilitate an understanding of the effects of multiple affect, table 2.4 collates the effects of cognition, mood, argument and emotions on belief or cognition, following marketing messages.

		Primary cognition				Secondary cognition	
		Low constrained elaboration	**Unconstrained elaboration**	**High constrained elaboration**		**Unconstrained elaboration**	**High elaboration**
Cognitive message		Cue effect on belief	Influence on elaboration				
			Depends on motivation / relevance / argument	Large effect depending on argument		Reviews primary cognition	
Influence of mood	Ambiguous argument	Cue effect on belief	Larger effect (perhaps to preserve positive state)			Smaller effect	
	Strong or weak argument		Smaller effect			Larger effect (strong positive, weak negative)	
Affective message		Cue effect on belief	Influence on elaboration		Influence on belief	Influence on belief	
			Affective appraisal	**Cognitive appraisal**	**1) Argument**	**2) Bias cognition**	**Affective validation**	**Cognitive validation**
Happy		Positive	Pleasant, no effect	Certain, no effect	Backs up cognitive arguments	Active	Pleasant – like thoughts	Confidence in appraisal
Sad		Negative	Unpleasant, increases	Uncertain, increases		Passive	Unpleasant – dislike thoughts	Doubt in appraisal
Anger		Negative	Unpleasant, increases	Certain, no effect		Active	Unpleasant – dislike thoughts	Confidence in appraisal
Surprise		Positive	Pleasant, no effect	Uncertain, increases		Active	Pleasant – like thoughts	Doubt in appraisal
Fear		Negative	Unpleasant, increases	Uncertain, increases		Active	Unpleasant – dislike thoughts	Doubt in appraisal
Guilt		Negative	Unpleasant, increases	Certain, no effect		Passive	Unpleasant – dislike thoughts	Confidence in appraisal
Gratitude		Positive	Pleasant, no effect	Certain, no effect		Active	Pleasant – like thoughts	Confidence in appraisal

Table 2. 4: Effect of cognitive message and affective message on belief and elaboration, during primary cognition and secondary cognition

Table 2.4 takes into account an individual's circumstances, including whether an individual is engaging in primary cognition or secondary cognition, and on the level of elaboration likelihood. For example, when moving left to right across the columns of the table on the row for the emotion happiness, it is seen that happiness could affect belief positively as a cue effect when elaboration likelihood is constrained low. When elaboration likelihood is unconstrained, happiness could increase elaboration when a cognitive appraisal is taking place. When elaboration is constrained high, happiness could influence belief positively as a bias or additional argument. When secondary cognition is taking place, happiness could validate the results of elaboration or previous elaboration due to the pleasantness of the emotion (affective validation) or the feeling of confidence gained (cognitive validation). Table 2.4 is compiled from Petty and Briñol (2015), Rucker, Briñol and Petty (2011), Smith and Ellsworth (1985), Russell (1980), Armenta, Fritz and Lyubomirsky (2017), and Cong, Keltner and Sauter (2022).

If fear, surprise and sadness appear to be having the same positive effect on message effectiveness in Dillard et al. (1996), we can use table 2.4 to see in which circumstances these three variables have the same effect simultaneously. The most likely explanation is that cognitive validation of thought during secondary cognition is taking place, with all three emotions creating confidence in previous conclusions (perhaps that drug-taking is dangerous) with individuals having previously conducted cognition on what is essentially a simple topic (Petty and Briñol, 2015). This interpretation implies that individuals' attitudes are more oriented towards cognition than affect (Petty

and Briñol, 2015), which is logical as public health information is simply a set of facts with which it is easy to agree with in principle (for example, that sharing a needle is dangerous) (Dillard and Peck, 2000). Affective validation does not seem to be taking place, as that would imply that surprise (a pleasant emotion) would have the opposite effect to fear and sadness (unpleasant emotions), as again shown in table 2.4, which is not the finding of Dillard et al.'s (1996) study.

Cognitive validation could also be based on positive emotions. In Dillard and Peck's (2001) examination of the *Get Off It* PSA, the emotion of happiness influenced persuasiveness within a positive message frame. With reference to table 2.4 again, this time the 'confidence in appraisal' associated with happiness within cognitive validation brings a strengthening of the idea that exercising is a good idea, an effective strategy without the problems associated with negative long-term messaging.

Dillard and Peck's (2001) study is not exhaustive as it did not compare the effects of emotions arising from a negatively framed physical exercise campaign, and so it is not conclusive as to whether a positively framed message would or would not be more successful at encouraging individuals to exercise, for individuals whose elaboration is not constrained low. As the study does not measure elaboration likelihood, it can only be assumed that elaboration is low but unconstrained with no further thinking taking place when cognitive validation of previous secondary cognition is taking place.

In summary of section 2.4.1.2.3, an examination of key health communication studies concludes that individuals often experience multiple affect and may experience the cognitive validation of secondary cognition when responding to simple public health communications messaging with cognitive attitudes.

However, it was concluded in section 2.3 that communications campaigns should be based around elaboration likelihood and existing attitudes. To understand whether individuals could have multiple starting points situationally with regard to public health matters, it is important to take a more detailed look at the role cognitive response plays when individuals respond to affective messaging, the subject of the next section.

2.4.1.3 Affect takes a peripheral route with no cognitive response

The roles played by affect and cognition, and the relationship between the two, gives an insight into how individuals are being persuaded by PSA health communications. This insight has informed the clustering of respondents within this PhD research study into four clusters, based on elaboration likelihood (high/low) and attitude certainty (high/low), as explained below.

The key finding in Dillard et al. (1996) is that affect takes a peripheral/heuristic route when influencing the acceptance of Aids PSA messages. In their second study, Dillard et al. (1996) analyse participants' reactions to Aids PSAs to investigate whether the relationship between six affects and perceived message acceptance is mediated by cognitive response. As there was no statistically significant connection between the affects and cognitive response in Dillard et al's (1996) second study, it was concluded that the three emotions which had a statistically significant effect on message acceptance - surprise, puzzlement and fear - took a peripheral/heuristic route. In comparison, dominant cognitive response had no statistically significant impact on message acceptance. Interestingly, Dillard, Weber and Vail (2007) found a strong relationship between the constructs perceived effectiveness and actual effectiveness, implying that a dominant cognitive response would also be unlikely to influence behavioural intention and behaviour in Dillard et al.'s (1996) second study. In summary, affect had the greater impact on message persuasiveness, despite individuals' dominant cognitive attitudes.

If affect takes a peripheral route, and cognition is not influencing perceived effectiveness, it is likely that an affectively based message frame will be the most effective when delivering a PSA. This result seems particularly relevant for simple PSA communications (Dillard and Peck, 2000). When exploring the relationship between emotional response and behavioural intention for PSAs focusing on child abuse, Paek et al. (2011) note that emotional appeals produce greater recall and have a stronger relationship with behavioural intention than informational appeals, especially among audiences with low involvement. Austin, Pinketon and Fujioka (1999) found that PSAs emphasising logic-based appeals at the expense of emotion-based appeals compromise their effectiveness.

Explanations for how the result of emotions taking a peripheral route informs the clustering of respondents into four clusters in this PhD research study are now given in sections 2.4.1.3.1 to 2.4.1.3.3. The four clusters are summarised in a simplified version of table 2.3 on page 142, which listed the most effective message frame based on matching effects theory (Clarkson, Tormala and Rucker, 2011; Ryfell and Wirth, 2016) and ELM theory (Petty and Cacioppo, 1986). This simplified table is presented as table 2.5 below and contains predictions for the most effective message frame for the four clusters in this study. Recognising Rucker and Petty's (2006) view that messaging should take into account individuals' attitude certainty and elaboration likelihood, this table is simplified, omitting outcomes for dominant affective attitudes, as attitudes for physical exercise and public health matters have been found to be predominantly cognitive in nature (Lawton, Conner and McEachan, 2009;

Dillard et al., 1996). It also omits outcomes where elaboration is constrained low, due to the simple content associated with health messaging being easy to process and understand (Dillard and Peck, 2000). To simplify the research design of this experiment, the remaining two categories for elaboration likelihood are described as high and low, and these categories make up four clusters by appearing alongside low and high attitude certainty in table 2.5.

Most effective message frame – dominant cognitive attitude		
Elaboration	**Attitude certainty**	
	Low	High
High	***Cluster 1*** ***MATCHING EFFECT*** Cognitive message frame	***Cluster 2*** **MATCHING EFFECT** Cognitive message frame
Low	***Cluster 3*** ***MISMATCHING EFFECT (Amplification hypothesis)*** Affective message frame	***Cluster 4*** ***MISMATCHING EFFECT (Crystallisation hypothesis)*** Affective message frame

Table 2.5: The message frame expected to be the most effective within the four clusters used within this research study.

Compiled using Ryffel and Wirth (2016), Clarkson, Tormala and Rucker (2011), Petty and Briñol (2015).

2.4.1.3.1 Clusters 1 and 2: elaboration likelihood high

In clusters 1 and 2 in table 2.5, where individuals hold a dominant cognitive attitude and elaboration likelihood is high for the topic, it is theorised that individuals will be more responsive to a cognitive message frame, regardless of levels of attitude certainty (Petty and Cacioppo, 1986). However, with a simple message when no further elaboration is possible, it is possible that an affective message frame will be the most effective, as is the case in Dillard et al.'s (1996) second study.

Understanding this result requires an understanding of the difference between cognition and belief. When emotions do not influence cognition and take a peripheral route, as in Dillard et al.'s (1996) second study, they may still influence belief. Normally, further elaboration takes place when elaboration is high due to a high need for cognition. That is not possible with such simple messaging, as there is nothing more to process, despite processing sufficiency not having been met (as discussed in section 2.3.2.1.2 on page 109). However, facts can seem to be 'more true' or 'less true' even when no further thinking has taken place due to the influence of positive or negative affect. For example, affect could act as an additional argument as part of primary cognition. Although individuals are not able to process systematically, affect still influences belief (Petty and Briñol, 2015). Hence it is possible for elaboration to be high for some individuals in Dillard et al.'s (1996) second study, with emotions influencing belief as well as affective attitude, despite no further cognition taking place. Two other scenarios are investigated, for clusters 3 and 4.

2.4.1.3.2 Cluster 3: elaboration likelihood low, attitude certainty low

Cluster 3 in table 2.5 shows that a mismatching affectively based frame may be the most effective when individuals have a cognitive attitude held with uncertainty when elaboration is low but unconstrained. This follows the conclusions of Clarkson, Tormala and Rucker (2011), following an experiment examining attitudes to a new form of blood donation, where a group with an uncertain cognitive attitude found a mismatching affective frame more persuasive due to the effects of the amplification hypothesis. Within cluster 3, it could be that elaboration likelihood has always been low due to a lack of interest in the topic, leading to individuals' attitudes being influenced by the simple valence of an emotion as a heuristic cue, with positive emotions, such as happiness, surprise and gratitude, leading to persuasive cue effects on belief, as shown in table 2.4 above on page 162. Belief may therefore still be influenced when emotions take a heuristic route; for example, when the smile of an attractive speaker creates happiness and influences belief. This may be an alternative explanation for why emotions, not cognition, are persuasive within Dillard et al.'s (1996) second study, assuming some of the participating students had little interest in the topics of the PSAs. In that study, the negatively valanced surprise and fear gave individuals negative associations with the social ills represented in the Aids PSAs to influence persuasiveness and lower the intention to engage in dangerous behaviours.

2.4.1.3.3 Cluster 4: elaboration likelihood low, attitude certainty high

An affectively based frame can also be the most persuasive when elaboration is low without being constrained low, when processing fluency is high. That is, elaboration likelihood had previously been higher, but became low when individuals reached high processing fluency. In this scenario, emotions experienced act as cognitive validation within secondary cognition, as shown in the last column in table 2.4 above on page 162. As surprise and fear, two of the persuasive emotions in Dillard et al.'s (1996) second study, have a positive effect on message acceptance (not opposing effects), it is possible, looking at table 2.4, that some individuals are performing cognitive validation of existing opinions (for example, to be even more opposed to intravenous drug use) within secondary cognition. Again, belief is influenced, but cognition is not.

This explanation requires reflection on Ryffel and Wirth's (2016) study of cognitive-affective matching to acknowledge the role of processing fluency, as introduced in section 2.2. It is likely that participants were already very familiar with the PSAs' simple messages (such as do not share needles, use contraceptive protection) hence they were not prepared to do any more thinking about the matter regardless of message content; their thoughts had become a form of cognitive bias based on previous secondary cognition (Haselton, Nettle and Andrews, 2005). Indeed, Dillard and Peck (2000:463) agree that "PSAs are brief… and they lack much argumentative structure… These observations imply that individuals who are exposed to PSAs may have little choice but to gravitate towards heuristic processing." Affect therefore takes a

peripheral/heuristic route, as no more thinking is desired. Belief may change, though, as emotions encourage individuals to rely more on their existing thoughts. As familiarity with a topic leads to high processing fluency, individuals with unconstrained elaboration who hold a cognitive attitude with certainty are likely to experience higher levels of attitude change if they are subjected to a mismatched affective frame due to the effect of the crystallisation hypothesis, leading to heightened message scrutiny (Ryffel and Wirth, 2016; Clarkson, Tormala and Rucker, 2011). This is the outcome for cluster 4 in table 2.5.

Eight hypotheses test whether the most effective message frame is that predicted by matching effects and ELM theory, as summarised in table 2.5. Hypotheses H12a to H12d follow the lead of previous studies on matching effects by examining the effect of attitude only on new behavioural intention.

H12a Matching effect: In cluster 1, a cognitively framed message is the most effective message

H12b Matching effect: In cluster 2, a cognitively framed message is the most effective message

H12c Mismatching effect: In cluster 3, an affectively framed message is the most effective message (amplification hypothesis)

H12d Mismatching effect: In cluster 4, an affectively framed message is the most effective message (crystallisation hypothesis)

Matching effect literature generally does not use the RAA framework when investigating the influence of message frames on dependant variables. Hence to fill a research gap regarding the prediction and changing of human social behaviour, hypotheses H13a to H13d examine the effect of all RAA predictors (attitude, subjective norm, self-efficacy and extraneous variables not included within this research) on new behavioural intention.

H13a Matching effect: In cluster 1, a cognitively framed message is the most effective message

H13b Matching effect: In cluster 2, a cognitively framed message is the most effective message

H13c Mismatching effect: In cluster 3, an affectively framed message is the most effective message (amplification hypothesis)

H13d Mismatching effect: In cluster 4, an affectively framed message is the most message (crystallisation hypothesis)

This leads to this PhD research study's third research question: **RQ3: What are the most effective pathways to improving behavioural intention within a social marketing campaign focusing on physical exercise?**

All hypotheses relating to path coefficients are included in the final version of the conceptual model in figure 2.8f on the following page.

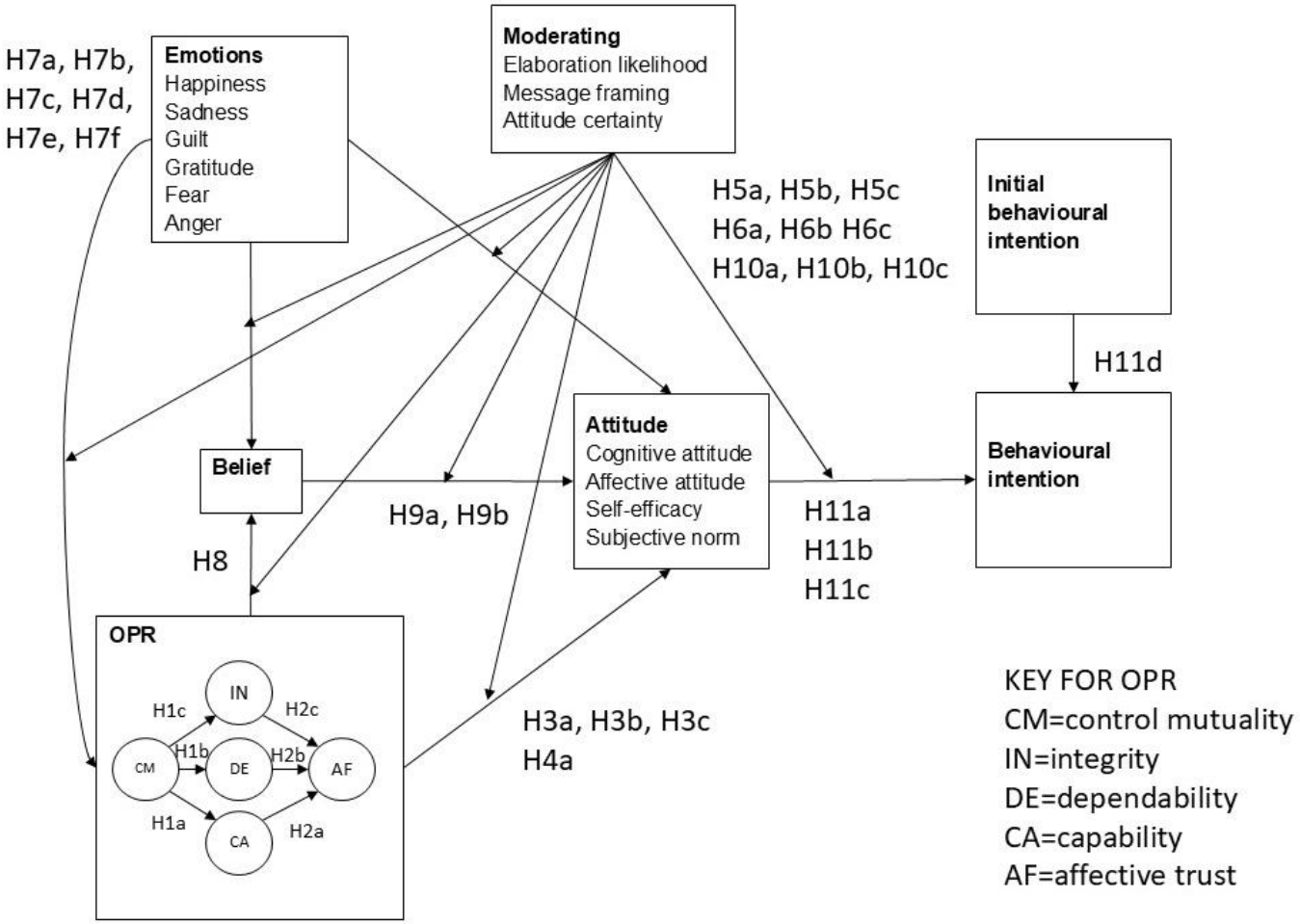


Figure 2.8f: Conceptual model including hypotheses for pathways

2.4.1.3.4 Discounting other outcomes

Other outcomes from matching/mismatching effects in table 2.3 on page 142 have been discounted for not being relevant to this PhD research study, hence they do not appear in the simplified table 2.5 on page 168. As mentioned, this includes outcomes where individuals have a dominant affective attitude and outcomes where elaboration likelihood is constrained low.

In addition, the outcome where individuals have unconstrained elaboration likelihood and a certain cognitive attitude with low processing fluency has been discounted. Theoretically these individuals would have been most responsive to a matching cognitive message frame, had the message contained enough information to stimulate further cognition; Wan and Rucker (2013) conclude that those who have confidence in their attitudes respond better to more detailed abstract communications. However, it is extremely unlikely that an individual will simultaneously have low processing fluency and a certain attitude for a simple message. They are more likely to have high processing fluency, which places them either in cluster 2 (if they high elaboration likelihood) or cluster 4 (if they have low elaboration likelihood).

It is impossible to identify whether individuals in Dillard et al.'s (1996) second study are all in just one of the clusters mentioned in sections 2.4.1.3.1, 2.4.1.3.2 and 2.4.1.3.3, or whether they are scattered in two, three or four of the clusters, when promoting simple health messages. This is because elaboration likelihood, attitude certainty and processing sufficiency are not included as

variables in the study. Understanding individuals' positions situationally could be seen as an important research gap when understanding the prediction and changing of human social behaviour.

In summary of section 2.4.1.3, having reviewed the relationship between affect and cognitive response in research studies, to understand why affect led to persuasiveness following simple PSAs, four clusters in table 2.5 have been identified as being the most likely situationally for the promotion of physical exercise. These four clusters are investigated in this PhD research study to model public health message effectiveness. All four have dominant cognitive attitudes. Two have certain attitudes; two have uncertain attitudes. Two have elaboration likelihood constrained high; two have unconstrained elaboration likelihood.

A conclusion summarises the main findings from this review of health communications.

2.4.2 Conclusion

In arriving at four clusters situationally for physical activity, this literature review of health communications has highlighted an important research gap. Although many studies have examined public health messaging, the exclusion of the variables at the level of the individual, such as elaboration likelihood and attitude certainty, limit the development of a fuller understanding of campaign effectiveness. Including the variables at the level of the individual helps explain how cognitive-affective matching and mismatching effects help drive attitude change and behaviour change in the promotion of physical exercise. The absence of the variables potentially explains the differing results obtained by previous studies testing for the most effective message framing.

Further elaboration is likely when a message contains information on a new health topic not previously publicised, such as avoiding coronavirus (Fridkin et al., 2023). It is less likely for familiar topics, such as the benefits of physical exercise when secondary cognition has already taken place and cognitive validation is required to strengthen attitude (cluster 4 in this PhD research study). Of course, an individual may have elaboration likelihood constrained high and therefore requires more information on the topic of physical exercise, ideally as abstract information (as in clusters 1 and 2). Alternatively, an individual may not be interested in a topic regardless of how simple the topic is to understand hence elaboration likelihood is low but not constrained low (cluster 3). Social marketers should ideally use different message frames for different clusters of stakeholders to maximise campaign effectiveness, realising

that messages will have different effects on emotions, belief and attitude in the four clusters. In addition, it has been noted that messaging leading individuals to experience multiple affect could undermine effectiveness if affects have opposing effects on persuasiveness.

Other missing variables that may affect results include the dimensions of OPRs, particularly affective trust. For instance, within Dillard et al's (1996) study focusing on Aids PSAs, experiencing the emotions happiness and gratitude following the PSAs would perhaps have improved affective trust and hence affective attitude, boosting message acceptance given that an affectively based frame is likely to be the most effective. This impact on affective attitude, via affective trust, could explain affective attitude's greater impact on behavioural intention compared to cognitive attitude within healthy lifestyle communications (Lawton, Conner and McEachan, 2009).

Having established that message effectiveness could be improved by dividing stakeholders into four clusters (by elaboration likelihood and attitude certainty in 2x2 research design) to aim messaging at the level of the individual and having noted that OPR dimensions could be included in persuasive pathways within social marketing, the four areas of literature reviewed are now discussed in a final conclusion.

2.5 Conclusion to literature review

Behaviour is the only evaluation of public relations that counts (Jackson, 1986), while public relations missing out the important role of OPRs can become ineffective (Kang and Yang, 2010). To properly assess the relative effect of OPRs on behaviour in social marketing focusing on physical exercise, individuals' different circumstances must be compared. By analysing differently framed marketing messages' influence on emotions, belief, OPRs, attitude and behavioural intention, at different levels of elaboration likelihood and attitude certainty, the relative influence of OPRs, compared to belief and affect, can be measured for different groups of stakeholders. Such an exercise allows scrutiny of which pathways are most successful in inducing voluntary behaviour change when considering the level of the individual.

The conceptual model (figure 2.8f on page 174) fills several research gaps within public relations literature for the prediction and change of human social behaviour. As trust consists of four elements, the variables integrity, capability and dependability predict cognitive trust, while affective trust predicts affective attitude. This facilitates analysis of the effect on cognitive attitude of the individual cognitive elements of trust, to see which are the most crucial, as well as the effect on affective attitude of affective trust. As a number of paths include affective trust, it is likely that the effect of OPRs on attitude and behaviour has previously been under-estimated. Models of partnership-building within social marketing would benefit from such a model including these four trust variables along with affective attitude and behavioural intention, which would help to

answer calls for a multi-party model of OPRs, although this is not within the scope of this PhD research study. One successful partnership though must be between an organisation's public relations and social marketing departments, to avoid contradictory messaging.

To measure OPRs, Hon and Grunig's (1999) scale emerged as the most popular among researchers, although a number of studies find measurement of the variables control mutuality and trust the most crucial. This scale has never been used within a study focusing on the promotion of physical exercise.

Isolating the most effective message frames is a useful benchmark when assessing the effectiveness of OPRs. As affective messaging has been seen as the most effective for PSAs, this PhD research study has identified four clusters for public health messages where affective messaging is likely to be the most effective. Messages employing an affective message compromise as a social exchange may be the most effective when individuals have a dominant cognitive attitude held with certainty and high processing fluency, with emotions providing cognitive validation of secondary cognition (cluster 4 in this PhD research study in table 2.5 on page 168). This is down to the effects of the crystallisation hypothesis.

Affectively framed messages may also be the most effective for individuals with uncertain cognitive attitude and low elaboration likelihood (cluster 3 in table 2.5). This is down to the effects of the amplification hypothesis.

While affectively framed messages may not be the most effective for individuals whose elaboration is constrained high when they are more in need of cognitive information (clusters 1 and 2), simple public health messages contain new little cognitive information, hence affective messaging may also be more effective for clusters 1 and 2, if affect acts as an additional argument or biases existing thoughts within primary cognition, as shown in table 2.4 on page 162.

As individuals responding to simple health messaging were found to take a peripheral route, one or more of these four clusters may situationally be suitable targets for the promotion of physical exercise. However, when declaring the most effective message frame for a cluster, it should be remembered that attitudes held with certainty lead to more enduring changes in behaviour.

Of course, when framing at the level of the individual, not the behaviour, it must be recognised that there may be a difference in results according to whether messages are positively or negatively framed. It must also be remembered when planning social marketing that an emotion can have more than one effect on an individual at the same time, for example influencing belief as a heuristic cue, influencing belief as validation, as a predictor of affective attitude and/or as a predictor of affective trust. Individuals may experience multiple affect and may not experience the emotions intended by social marketers due to cognitive appraisals. Emotions to be induced must be chosen carefully and competently for a message to reach its full potential.

In summary, assessing the effect of OPRs within social marketing means examining the behaviour of OPR dimensions within a wider persuasion model such as the RAA, acknowledging that OPRs may have different levels of effect for different clusters of stakeholders. To date, no studies have compared the effects of a number of differently framed marketing messages on emotions, belief, OPRs, attitude and behaviour at different levels of elaboration and attitude certainty for the prediction and change of human social behaviour and this remains a research gap.

3. Research philosophy and strategy

3.1 Introduction

This chapter discusses the philosophical assumptions behind this PhD research study, before describing the research methodology. It then describes the research strategy for this study.

3.2 Research philosophy

To add to knowledge, one must make various philosophical assumptions. When attempting to tackle the growing problem of obesity in the UK as detailed in *The Lancet* (Wang et al., 2011), empirical research into the role of OPRs within effective public health communications must be developed from clearly defined ontological, epistemological and axiological positions (Bryman and Bell, 2007).

Researchers disagree on the existence of one ‘best’ philosophical combination of ontology, epistemology and axiology for business and management research. By considering these concepts, a researcher is led to a preferred philosophical position within a landscape of options (Saunders, Lewis and Thornhill, 2016), as shown in table 3.1. The three concepts are now considered individually with respect to this PhD study.

	Non-recognition of the relevance of human subjectivity	Recognition of the relevance of human subjectivity
Ontology: realism **Epistemology: facts** 	Positivism (value free)	Methodological pluralism Pragmatism (value driven) Critical realism (value laden) Interpretivism (value bound)
Ontology: nominalism **Epistemology: interpretations**	(Not a possible combination)	Postmodernism (value constituted)

Table 3.1: Comparison of research philosophies.

Adapted by the author from Gill and Johnson (2002:138), Saunders, Lewis and Thornhill (2016) and Fisher (2010)

3.2.1 Ontology, epistemology and axiology

Making assumptions about the nature of reality, ontology is described by two concepts: realism (objects exist independently of our knowledge) and nominalism (meaning is created through language and perceptions) (Saunders, Lewis and Thornhill, 2016). This PhD research study assumes that concepts such as trust, belief and affect (emotions, such as happiness and fear) are common to all while being experienced individually. While we all can experience fear, we may respond to a stimulus, such as the information in marketing communications, with fear of different levels of intensity due to different cognitive appraisals or with a different emotion entirely (Dillard and Peck, 2000; Smith and Ellsworth, 1985). This research study also assumes that exercise being good for one's health is common to all and is not socially constructed. This positions the research closer to realism than nominalism.

Epistemology is defined as “a branch of philosophy concerned with assumptions about knowledge, what constitutes acceptable, valid and legitimate knowledge, and how we can communicate knowledge to others” (Saunders, Lewis and Thornhill, 2016:716). At one extreme are facts, numbers and observable phenomena; at the other are opinions, narratives and attributed meanings (Burrell and Morgan, 1979). This research study assumes that concepts that are common to all, such as the emotion of fear or attitudes, can be measured numerically as to their existence and level of certainty. This positions the research closer to the concept of facts than interpretations.

A third philosophical consideration is axiology, a branch of philosophy concerned with the role of values and ethics within the research process (Saunders, Lewis and Thornhill, 2016). One extreme is value-free, the other value-bound. This research study aims to improve public health, which can be associated with good ethics and values. In addition, the values motivating respondents’ responses influence their belief that physical exercise is good for one’s health, due to values being influenced by culture and upbringing (Saunders, Lewis and Thornhill, 2016; Tench and Yeomans, 2006). However, these values are not of specific interest to the research, nor will they be influenced by the values of the researcher. This research is therefore positioned midway between value-free and value-bound, with the axiology being described as value laden, due to the existing values held by respondents and the motivation for the research being to improve the health of the nation.

Ontology, epistemology and axiology exist on an objectivism-subjectivism continuum, with the two extremes defined by the experiencing of one true reality and multiple

realities respectively, the latter socially created or based on convention. As behaviour change can be dependent on logic, social mores, past experience, the extent of a disagreement between behaviour and belief, speaker credibility and the perceived relative importance of behavioural and environmental elements (Festinger, 1957), this research study recognises that background factors introduce a degree of subjectivity to the data.

The above preferences regarding ontology, epistemology and axiology lead to the selection of critical realism among the options in table 3.1.

3.2.2 Philosophical position

The reasons for this PhD research study adopting critical realism, initially discussed within Roy Bhaskar's work in the late 20th Century (Bhaskar, 1975), as its philosophical position are now discussed.

3.2.2.1 Positivism

Given the above ontological, epistemological and axiological considerations, this research study could not adopt positivism, positioned at one ontological extreme (top left in table 3.1), despite being concerned with how the variables in the empirical model (shown in figure 3.1 below on page 252) interact and connect. Associated originally within the social sciences by 19th Century philosopher Auguste Comte and the founding father of sociology, Emile Durkheim, positivist methods yield “pure data and facts uninfluenced by human interpretation or bias” (Saunders, Lewis and Thornhill, 2016: 136) and build on the empiricist assumption that all knowledge is based on the experiences of the senses (Gerber and Macionis, 1978; Bryman and Bell, 2007; Fisher, 2010). It is impossible to measure constructs such as cognitive attitude, affective attitude and emotions without respondents’ interpretations influencing the results, as they are latent variables, not observed variables such as age or height (Byrne, 2016). This study does not assume that knowledge based on the senses and experience will lead to pure data and facts uninfluenced by interpretation and bias.

Indeed, Popper (1934) rejects absolute positivism. Criticising contemporary scientific methods for relying too heavily on untested theories and conclusions via induction (moving from specific results to generalisations), Popper (1934) proposes a process where conjectures (for example thinking all swans are white) could be tested for falsifiability (for example finding a black swan). Popper (1968:33) notes that “a positive decision can only temporarily support the theory, for subsequent negative decisions may always overthrow it". Kuhn (1962) develops similar thoughts with paradigm shifts (a fundamental change in approach) resulting from unexpected research results.

Within this PhD research study, respondents' beliefs could similarly be based on experiences to date, such as the knowledge that running 10km a week is good for one's health, when it is possible that such an activity is later found to lead to knee problems hence is bad for one's health. Such a possibility nevertheless underlines the fact that knowledge does not necessarily reflect reality. However, reality is out of reach until alluded to by research results.

3.2.2.1.1 Logical positivism

Logical positivists emerged in the 1920s, incorporating the rules of formal logic and hypothetico-deductive logic, to help social science match the achievements of science in predication and explanation. Logical positivism declares that a deduced proposition must be the result of objective foundational premises being 'true' rather than emanating from the researcher's subjective opinions and biases (Lee, 1991). With formal logic a major premise (such as all men are mortal) and a minor premise (such as Socrates is a man) lead to a conclusion (Socrates is mortal) - a logical argument known as a syllogism. With hypothetico-deductive logic, the major premise is a general theory (such as OPRs improve persuasiveness), the minor premise a set of facts describing a situation (such as growing rates of obesity in the UK) and the conclusion is what the theory hypothesises to be observed (such as stronger OPRs lead to lower rates of obesity). Although the theory is not directly verifiable due to unobservable entities, it can still be corroborated empirically from the hypothesised observable consequences that have been logically deducted from it. Together, formal and hypothetico-deductive logic allow theoretical propositions to satisfy the four requirements of Popper (1968): falsifiability (a lack of contradictory observations);

logical consistency (formal and hypothetico-deductive logic); relative explanatory power (to explain the subject matter in question); and survival (following successive rounds of testing). However, propositions can always be disproven in future tests. For example, building a stronger OPR may not lead to more effective public health campaigns in certain instances, perhaps if an individual has elaboration likelihood constrained high, in which case cognitive messaging based on influencing belief is likely to be more effective (Petty and Briñol, 2015; Teeny et al., 2001). This PhD research study did not take logical positivism as its philosophical position as the conclusion (stronger OPRs will lead to lower rates of obesity) is dependent on the interaction of many variables, as shown in the empirical model below (figure 3.1). It would be unrealistically complex to capture the structures influencing these interactions within logical positivism.

3.2.2.2 Post-positivism and critical realism

Despite not taking positivism or logical positivism as its philosophical position, this research study, in choosing critical realism, has taken a position that resides within a set of philosophies known as post-positivism: less attenuated forms of positivism that claim “a certain level of objectivity rather than absolute objectivity” (Crotty, 1998:29).

3.2.2.2.1 Post-positivism

Within post-positivism, reality is assumed to exist, but it is only imperfectly attainable (Guba and Lincoln, 1994; Alvesson and Sköldberg, 2009). Post-positivism was

employed for two reasons. Firstly, most of the variables within the conceptual framework cannot be measured directly, as temperature or age can, therefore some variables must be treated as latent variables, which are measured via scales comprising one or more items referred to as indictors (Byrne, 2016). For example, the dimensions most frequently associated with OPR research - control mutuality, satisfaction, trust and commitment - are latent variables normally measured by an 18- or 21-point scale developed and tested by Hon and Grunig (1999) and completed by respondents. Researchers have not yet answered Ferguson's (1984) or Hon and Grunig's (1999) call for a scale that measures relationships independently of organisations' or publics' perceptions. It is therefore possible that respondents' perceptions of OPRs and other latent variables may be subject to bias, perhaps due to heuristic cues. Chaiken (1987) includes heuristic cues as a passive and less thoughtful path in the Heuristic Systematic Model, and Petty and Cacioppo's (1986) Elaboration Likelihood Model associates them with individuals who are not prepared to think more about an issue, either because they are unable to perform the necessary thinking (elaboration likelihood constrained low) or because they feel that they have done all the thinking that is required to make a conclusion on the matter despite more information being available (low but unconstrained elaboration likelihood). These heuristic cues could then lead to cognitive bias due to the resulting effects on belief. This result can also be explained by the difference between the theories of rationalism and empiricism, the former concerned with basing decisions purely on knowledge from reason and logic (not religious thought or tradition), the latter assuming that knowledge is derived from the senses and experience (Bryman and Bell, 2007). Knowledge gained from the senses could lead to bias if, for example, existing thoughts are strengthened by an emotion that generates a feeling of certainty, such as anger,

leading to reliance on existing thoughts, rather than a desire to reassess a topic using reason, often prompted by experiencing an uncertain emotion such as fear (Petty and Briñol, 2015). This PhD research study acknowledges that elaboration likelihood is one of the structures within reality that can lead to differences in the amount of cognitive processing performed by respondents, which can in turn lead to differences between individuals in their responses to research questions.

However, many forms of cognitive bias have been identified since Tversky and Kahneman (1974) introduced the term. Benson's (2016) Cognitive Bias Codex features more than 200. For example, confirmation bias leads individuals to base their conclusions on information or thoughts that confirm their existing belief; and affinity bias prompts people to be influenced by people like themselves. Bias can lead to systematic errors of judgment (Tversky and Kahneman, 1974). Promoting thinking (elaboration likelihood) to reduce bias is an ongoing challenge for strategic communicators, Pfau and Wan (2006: 114) concluding that "heuristic message processing is, in all likelihood, the dominant processing mode for most public relations content" due to individuals either not wishing to process more information or having reached a processing sufficiency.

The second reason for adopting post-positivism is the recognition that even individuals prepared to make informed decisions based on the latest information (high elaboration likelihood) often arrive at biased conclusions based on their lived experiences, culture and identity. This is particularly so when information on an issue has not been communicated effectively or relevantly enough to bring about cognitive dissonance

and hence a change of belief on an issue, as Festinger (1957) predicts would be the case, assuming that people's changes in belief are motivated by a need for accuracy (Festinger, 1950). Whether an individual introduces bias via constrained or unconstrained elaboration likelihood, complete objectivity of one true reality cannot be assumed.

To take the three OPR cognitive trust elements as an example, an individual may not conduct extensive research into an organisation's integrity, dependability and capability before forming opinions on trust, even if the information for an NHS Trust is readily available via an online Care Quality Commission (CQC) report. The person may instead appraise trust from his or her own perspective, which may be affected by other variables such as age and gender. Post-positivism is a more fitting research philosophy for this project particularly as so many variables within the proposed research must be treated as latent variables: happiness and fear, attitude and behavioural intention, for example.

3.2.2.2.2 Critical realism

Within post-positivism this research study will adopt critical realism, initially discussed within Roy Bhaskar's work in the late 20th century, as a compromise between positivism and postmodernist nominalism, as its guiding philosophy (Bhaskar, 1975). This is because the study seeks to identify real structures previously hidden from the common view to revise theories (Saunders, Lewis and Thornhill, 2016; Fisher, 2010).

With its stratified ontology, critical realism assumes there are three overlapping domains: real, actual and empirical (Bhaskar, 2016). Concerned with identifying causal mechanisms (Bhaskar, 2016; Mingers, 2004), this approach to research has been described as having ontological realism, epistemological relativism and judgmental rationality (Bhaskar, 2016; Archer et al., 2016). Falsification (where reality is revised when more facts are discovered) is rejected in favour of there being one true reality that is observed imperfectly in the empirical domain (Bhaskar, 2016). Saunders, Lewis and Thornhill (2016) use the example of a cricket umpire to explain this philosophical approach. During a cricket match what an umpire has observed was in the empirical domain. The sum of everything that was happening on the cricket pitch was in the actual domain. It may have been, for example, that the umpire's view was obscured by a player, plus of course it is impossible for the umpire to see in all directions at once, although additional information could be available from other witnesses. What he or she misses explains the difference between the empirical and actual domains. The real domain contains underlying causes. For example, a foul could be intentional or accidental – yet an umpire is unable to know what the cause was, without further investigation, as some aspects of reality are hidden.

This PhD research study recognises that the empirical domain captures respondents' opinions for variables, such as OPR dimensions cognitive trust and affective attitude, via the indicators of observed variables used within a questionnaire. Some of these opinions will be based on personal experience, moderating factors and bias.

The actual domain contains the actual values of the latent variables the observed variables attempt to represent, which cannot be measured directly and without respondent bias (that is, the bias introduced when individuals attempt to record their opinions). The actual domain also contains the information that could be used to form a completely unbiased opinion on such concepts (that is, unbiased by factors such as age or gender) some of which will not have been seen by individuals. Examples of this type of information include an NHS Trust's Care Quality Commission report, or newly released academic research on the benefits of physical exercise. It is often not possible for individuals to conduct extensive research on an organisation or on public health matters before forming an opinion due to a lack of relevance, time or motivation.

Causal mechanisms such as the three levels of elaboration likelihood (constrained high, unconstrained, constrained low) and cognitive-affective matching effects, and their interaction, belong in the real domain, along with the cognitive appraisal process that form beliefs and emotions. The real domain also includes the fact that regular physical exercise is good for one's health.

This PhD research study uses results in the empirical domain to understand more about how causal mechanisms in the real domain influence belief, affect, OPR, attitude and behavioural intention in the actual domain. Such causal mechanisms include the effects on individuals' behavioural intention of cognitive-affective matching and mismatching effects and elaboration likelihood. An experiment investigates how attitude certainty, elaboration likelihood and message framing affect the relative influence of OPR, belief and emotions on behavioural intention.

Connecting the empirical domain to the actual domain, structural equation modelling (SEM) software deals with the systematic errors associated with self-reported studies, allocating error variables to certain indicators (such as the indicators of endogenous variables in reflective measurement models). These error variables underline the indicators' ability to measure an underlying latent variable, such as control mutuality, trust or self-efficacy (Hair et al., 2017). The inclusion of additional residual error variables for endogenous latent variables acknowledges that other factors also are responsible for variance in the variables of interest (Hair et al., 2017). For example, an individual's positive thoughts about the NHS's handling of the Covid-19 vaccination rollout may influence how the individual responds to survey questions focusing on his or her local integrated healthcare system. Subjectivity can therefore itself be quantified via SEM software, as variables not measured in the study, such as political persuasion, will appear together as additional extraneous influences on a variable, as an error variable.

This brief discussion of the error variables within SEM brings closes this investigation of the nature of this study's research. Having discussed the reasons for selecting critical realism, this chapter now describes the research design that guided the collection and analysis of primary data.

3.3 Research strategy

Having selected critical realism as its research philosophy, this research study took a deductive approach. Saunders, Lewis and Thornhill (2016) conclude that a deductive approach is the most suitable when a research question identifies clear theoretical positions that will be tested using appropriately gathered data. The experiment within this PhD research study tested theory developed by Hon and Grunig (1999) to analyse the effect of OPR on the effectiveness of a public health social marketing campaign, positioning the theory within a structural model that also incorporates Petty and Cacioppo's (1986) ELM, and Fishbein and Ajzen's (2010) RAA.

Quantitative methodology was used to gather and analyse data collected within Bedfordshire. Guba (1990) confirms that quantitative methodology is compatible with a positivist philosophy, as it is the best way to gather knowledge when testing a theory scientifically with empirical data. Guba (1990) explains that positivism and quantitative methodology can belong in the same research paradigm. This strategic approach is appropriate as the research study builds on previous research to test theory: 75 per cent of the OPR studies reviewed by Huang and Zhang (2015) opted for quantitative methodology. SEM was used to take a confirmatory approach to testing the causal processes connecting multiple variables (Hair et al., 2017).

Mono method research was undertaken using quantitative methods. The research was cross-sectional, as behaviour was not measured, reducing the complexity of the experiment to focus on constructs' effects on behavioural intention.

Chapter 4 describes the processes of experimental design, data collection and data analysis used in the experiment within this PhD study, before chapter 5 looks specifically at structural equation modelling using Smart PLS.

4. Research design

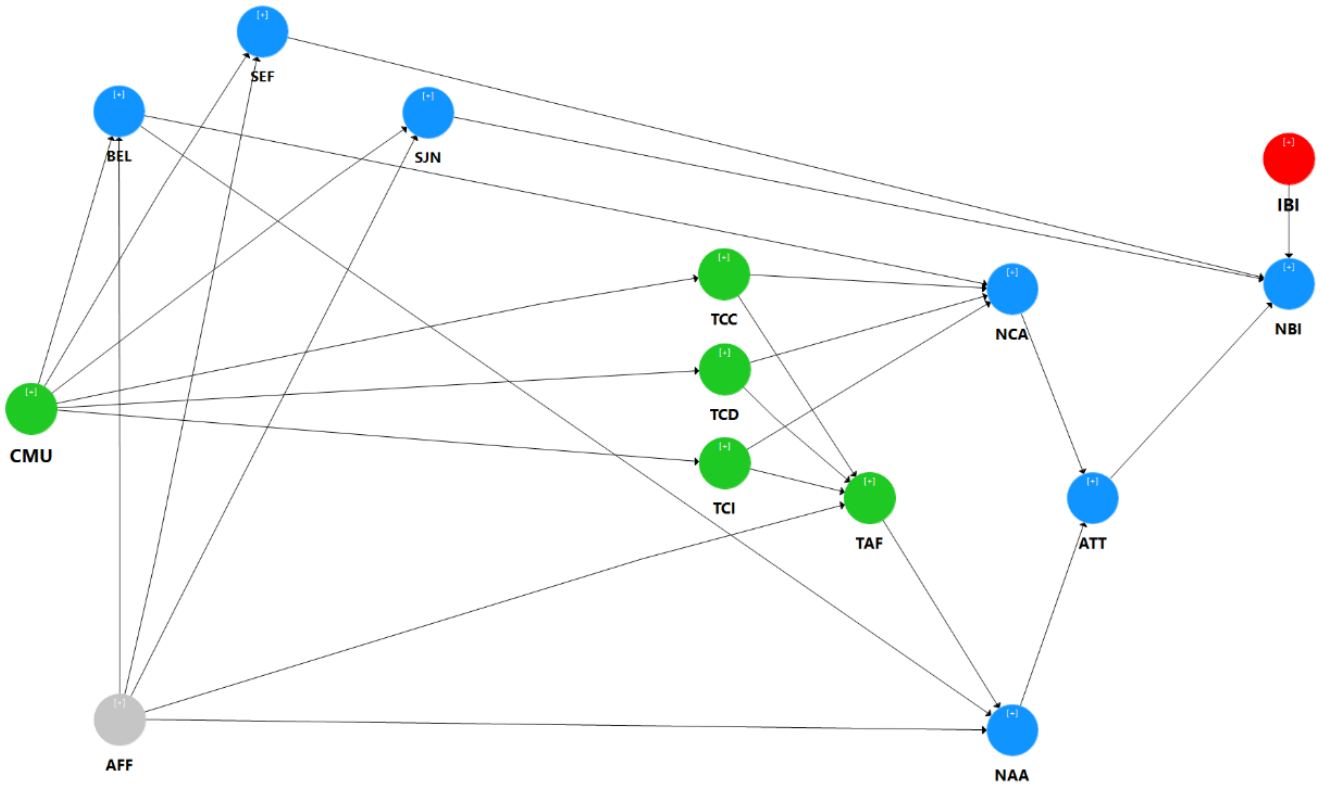
This chapter focuses on the design of the experiment for this PhD research study, the development of the scales used to gather data and the structure of the survey instrument.

4.1 Experimental design

To test the research hypotheses, an experiment was conducted with a 2x2x2x2 between subjects research design: 2 (attitude certainty high/low) x 2 (elaboration likelihood high/low) x 2 (message frame: cognitive/affective) x 2 (message frame valence: positive/negative). Hence a structural model was compiled from the conceptual model in figure 2.8f (on page 174). This is shown in figure 4.1 (on page 199). It was used to test the hypotheses in groups defined by their levels of attitude certainty, elaboration likelihood and message frame. The structural model includes connections between OPR and RAA variables and sees emotions included both as an RAA background factor (predicting belief, self-efficacy and subjective norm) and as direct predictors of affective trust and affective attitude. It comprises 19 constructs:

From OPR: control mutuality, integrity, capability, dependability, affective trust

From RAA: belief, new cognitive attitude, new affective attitude, attitude (a second order construct predicted by affective attitude and cognitive attitude), subjective norm, self-efficacy, new behavioural intention, initial behavioural intention (control variable), six emotions (background factor and direct connection to new affective attitude)



KEY

BEL=belief

SEF=self-efficacy

SJN=subjective norm

NCA=new cognitive attitude

NAA=new affective attitude

ATT=attitude

NBI=new behavioural intention

IBI=initial behavioural intention (control variable)

CMU=control mutuality

TCC=cognitive trust: capability

TCD=cognitive trust: dependability

TCI=cognitive trust: integrity

TAF=affective trust

AFF=affect (happiness, sadness, fear, guilt, gratitude, anger)

Figure 4.1: Structural model

Model brings together:

(1) constructs from the RAA (blue and red)

(2) constructs from OPR theory (green)

(3) affect (represented as one variable for simplicity in grey)

4.1.1 Sampling frame

The aim of this research is to analyse the relative influence of OPRs, belief and affect (emotions) on behavioural intention within a social marketing campaign promoting physical exercise. To achieve this, the required data on the latent and observed variables included in this research was collected from adult residents in Bedfordshire aged 19 to 64. Age and region are common stratification variables in social science research (Grow et al., 2022). The age and region of respondents was verified via questions within the survey instrument.

The 19 to 64 age group was chosen as it is mirrors the age bracket used by the NHS in its online advice on physical activity, to perform 150 minutes of moderate exercise or 75 minutes of vigorous exercise per week (NHS, 2021). This research did not aim to focus on a particular age bracket, such as those in the 40s, preferring to focus on promoting the importance of exercise to all adults. Focusing on the full age range of 19 to 64 also improved the chances of attracting the required number of respondents (see section 4.1.2 below).

All respondents answered questions about the Bedfordshire, Luton and Milton Keynes Integrated Healthcare System (BLMK), eliminating the need to account for regional differences in opinion regarding the relationship with a health services provider. Bedfordshire was chosen as the county is aiming to achieve higher levels of physical activity in adults in a physical activity strategy: 24.1% of men and 24.5% of women are classified as inactive in Central Bedfordshire; nearly 40% of adults fail to meet government recommendations for physical activity (Central Bedfordshire Council,

2020). The area was also chosen as the researcher lives within it and was able to join local Facebook groups (screened by questions filtering out non-residents) to promote the questionnaire via Facebook shares.

4.1.2 Sample size

The sample size of approximately 800 responses was chosen as this would result in approximately 50 responses in each of the 16 clustered groups in this experiment, an acceptable group size within PLS-SEM. For example, Hair et al. (2017) recommend a minimum sample size of 41 to detect a coefficient of determination R^2 of 0.25 when a variable has four predictors, for a significance level of 5% and a statistical power of 80%. When R^2>0.25, fewer responses are required at these levels of statistical power and significance: for instance, 18 responses are recommended to detect an R^2 of 0.50.

4.1.3 Recruitment

The questionnaire was promoted using a dedicated Facebook page www.facebook.com/howarddobsonphd via post-boosts (paid for by the researcher), 'shares' in local Facebook groups, and news items on local news blogs and websites. The Facebook post inviting people to complete the questionnaire is included in appendix 7. It was issued to a target audience of 19-to-64-year-olds in Bedfordshire, as detailed above, with no other targeting options selected regarding interests or user characteristics, to maximise the chances of those in the target frame having an equal opportunity of taking part, as is required in random sampling (Bryman and Bell, 2007).

Facebook has been accepted as a platform for sourcing survey data that represents a population (Grow et al., 2022; Schneider and Harknett, 2022). It was chosen as a recruitment platform for four reasons. Firstly, Facebook has been found to provide highly useable data. When tested, 99% of survey answers regarding stratification factors, such as age and region, matched the categorisations requested of Facebook advertising (Grow et al., 2022). Secondly, it is widely used by 54 million people in the UK (78% of the population). Thirdly, response rates for more traditional methods of probability sampling, such as address-based sampling and random digit dialling, have been declining (Grow et al., 2022).

Fourthly, the age profile of users closely matches the age profile selected for this the experiment (19 to 64), with 87% of users aged between 18 and 64 (54% women, 46% men) providing a large and easily accessible population from which to draw a sample. The age profile of Facebook users is also similar to that of the regional population for the age range of interest. For example, 23% of 20-to-64-years-olds in Central Bedfordshire are aged 25 to 34, while national Facebook users aged 25 to 34 account for 27% of users aged 18 to 64. Similarly, 21% of the 20-to-64-year-olds in Central Bedfordshire are aged 55 to 64, while national Facebook users aged 55 to 64 account for 13% of users aged 18 to 64. (ONS, 2019; Napoleon Cat, 2023; Gov.uk, 2023). The discrepancies are explained by the slightly different age brackets for the populations being compared, the unavailability of regional Facebook data for Bedfordshire, which are likely to mirror the local population more closely, and the positive skew in Facebook user data, with more users using the platform at the younger end of the scale. Given the favourable age distribution of Facebook users, post-collection weighting of data was not required to ensure that all age groups between 19 and 64 would be suitable

represented in the results, particularly as the readership for post shares in local news blogs and groups tends to be skewed in the opposite direction, according to an inspection of subscribers.

Social media users also replicate other demographic distributions well: the proportion with NVQ4 qualifications or above in Central Bedfordshire (35.1%) compares well with the national figure for social media users with NVQ4 or higher (42%) (Central Bedfordshire Council, 2025; Statista, 2025). No Facebook distributions by race are available although the Facebook advert was accessible to all races as more than 90% of all UK ethnic groups use the internet in the UK who therefore have access to Facebook (Gov.uk, 2019).

A digital NHS platform or digital platform published by the BLMK Heath and Care Partnership was not chosen for the recruitment of respondents, for two reasons. Firstly, Facebook was capable of targeting pageboosts to the desired age ranges and geographical area, without the risk of bias pertaining to physical condition or attracting a disproportionate number of NHS employees, aiding random sampling. Secondly, information contained on these platforms could have biased respondents' self-reported answers to OPR construct indicators. Respondents for experiments measuring an organisation's OPRs are not typically recruited from website platforms published by the organisation under examination (Ledingham and Bruning, 1998; Hon and Grunig, 1999; Sweetser and Kelleher, 2016).

4.2 Survey instrument development

RQ1 asks: *What are the key constructs in a structural model representing a social marketing campaign focusing on physical exercise?* Before key constructs could be identified, the latent and observed variables used within this experiment were measured via a survey instrument totalling 81 items. The variables are listed in table 4.1, while appendix 6 provides a complete list of items used, alongside the abbreviations used in path diagrams for these items and the constructs to which they relate, with references for the studies from which the measurement scales originate.

Independent variables	**Dependent variables**
Control mutuality (OPR) Happiness Gratitude Sadness Fear Anger Guilt Initial behavioural intention (*control variable*)	Competency (OPR) Integrity (OPR) Dependability (OPR) Affective trust (OPR) Belief Self-efficacy Subjective norm New cognitive attitude New affective attitude New behavioural intention
Moderating variables Elaboration likelihood Initial attitude certainty Message framing (cognitive/affective, positive/negative)	**Other variables measured (not in SEM model)** Processing fluency Initial cognitive attitude Initial affective attitude New attitude certainty *Manipulation check* Positive/negative framing Affective/cognitive framing *Profile* Age Gender Location Employment Initial vigorous exercise intention Initial moderate exercise intention New vigorous exercise intention New moderate exercise intention

Table 4.1: Summary of variables divided into categories

4.2.1 Latent variables

The latent OPR, RAA and moderating constructs measuring unobservable variables were reflective in nature (except for belief and attitude certainty, as mentioned below). This is because the indicators measuring them originated from a common cause (Hair et al., 2017; Byrne, 2016). The latent constructs aim to measure the overlap between their interchangeable indicators. To assess the value of latent constructs, the primary data was gathered using existing scales adapted for this research.

4.2.1.1 OPR variables

Although several scales have been developed to measure OPR, which is the main focus of this research study, Hon and Grunig's (1999) OPR scale was deemed the most suitable, as described in section 2.1. This is because it does not confuse the measuring of relationship maintenance strategies and measuring relationship outcomes (Ki and Hon, 2007a). However, the dimensions satisfaction and commitment were omitted from the questionnaire, as mentioned in section 2.1. Satisfaction and commitment may not significantly influence advocacy or attitudes, as the absence of an alternative provider organisation for health services may diminish the influence of commitment on attitude and behaviour, and the level of interdependence in the relationship may affect levels of relationship satisfaction without those levels of satisfaction influencing attitudes or behaviour (Wang, Ni and De la Flor, 2014). Concluding that control mutuality and trust are the most critical factors to relationship development, this PhD study includes the OPR constructs control mutuality (four Items), competency (two Items), dependability (two Items) and integrity (two Items)

and affective trust (five items). These five OPR constructs are shown in the final conceptual model in figure 2.8f in chapter 2 on page 174. They are also shown in the structural model in figure 4.1 above on page 199.

The indicators for cognitive trust and control mutuality were adapted from Hon and Grunig's (1999) scale to relate to a regional integrated healthcare system. For example, one indicator for control mutuality asks for the level of agreement with the following statement: 'The organisations in the BLMK and people like me are attentive to what each other say.' However, five indicators were adopted from McAllister's (1995) scale to measure affective trust, as this dimension is not measured within Hon and Grunig's (1999) scale or any other OPR scale, despite being acknowledged by Hon and Grunig (1999) as being an OPR dimension, as highlighted in section 2.1. McAllister's (1995) validated indicators constitute a widely accepted measure of affective trust (Gill et al., 2024). Again, these indicators were adapted to relate to the BLMK. One of them reads: 'I would feel a sense of loss if I was no longer able to have a relationship with the organisations in the BLMK.'

4.2.1.2 RAA variables

Some of the RAA variables were measured using the indicators included in Azjen's (2019) guidelines for compiling an RAA questionnaire, which coincidentally focus on the topic of physical exercise. However, other scales were incorporated in preference to those included in the guidelines when it was thought that a more widely used scale,

or a multi-item scale more suitable for SEM calculations (Hair, et al., 2017), was available.

Two-item scales were employed for the latent variables cognitive attitude and affective attitude, as previously used successfully in public health contexts, for example by Conner and Norman (2021) following the realisation in previous research that one-item scales placed a limitation on accuracy when measuring attitude (Lawton, Conner and McEachan, 2009). As Ajzen's (2019) RAA questionnaire guidelines only provide one indicator each for cognitive and affective attitude, Conner and Norman's (2021) indicators are based on Crites, Fabrigar and Petty's (1994) scales for affective attitude and cognitive attitude. They measure the semantic differentials of word pairs. Within a public health context, the word pairs often used to measure attitudes are harmful/beneficial and foolish/wise (cognitive); and unpleasant/pleasant and unenjoyable/enjoyable (affective). Both pairs have high levels of correlation (Conner and Norman, 2021).

When calculations were made to ascertain whether a respondent had a predominantly cognitive attitude or predominantly affective attitude, the value for initial affective attitude was subtracted from the value for initial cognitive attitude, with positive values representing a predominantly cognitive attitude, negative values representing a predominantly affective attitude (Ryffel and Wirth, 2016).

Wording from NHS (2018) was used to develop one indicator for behavioural belief. One indicator is recommended by Ajzen (2019) as part of the RAA. It was assumed

that one indicator was sufficient as belief can be expressed as a simple proposition "preceded by the phrase, 'I believe that'" (Rokeach, 1969:113). Variables with a single item are permissible in PLS-SEM and are neither formative nor reflective (Hair et al., 2017). It was assumed in this research study that high values for this variable represent a more extreme belief with lower levels of ambivalence, and that low values represent a less extreme belief with higher levels of ambivalence.

The two-item scale for subjective norm was also taken from Ajzen (2019) as part of the RAA. However, the five-item scale for self-efficacy was adapted from the measure developed by Marcus et al. (1992), a study which focuses on self-efficacy for physical exercise. While Ajzen's (2019) guidelines include a single suggested indicator, Marcus et al.'s (1992) scale includes five, asking for the level of agreement with: 'I am confident I can participate in regular exercise when: I am tired, I am in a bad mood, I feel I don't have time, I am on holiday, it is raining or snowing.'

Behavioural intention was measured via a three-item scale for intended future levels of physical exercise with proven high reliability (Van 't Riet et al., 2014), as Ajzen's (2019) guidelines again only provide one indicator for intention. The scale was amended to focus on intentions to exercise over the next seven days, instead of general intentions to complete a recommended level of physical activity sometime in the future, to better assess the immediate effect of the message delivered and to follow Ajzen's (2019) guidelines for including a fixed term for the intentions.

The emotions happiness, anger, sadness and fear were measured by three-item scales, while guilt was measured by a two-item scale, based on how accurately emotion-based adjectives described the feelings of respondents, developed over a series of studies by Dillard et al. with high levels of reliability (Dillard and Shen, 2006). The emotion gratitude was measured using the three-item scale successfully developed by McCullough, Emmons and Tsang (2002) with high reliability. Results of self-reported measures of discrete emotions have been found to generally correspond with results derived from machine-coded face-reading techniques (Shen, Dillard and Peng, 2022).

4.2.1.3 Moderating variables

RQ2 asks: *Are there significant differences between groups defined by elaboration likelihood, attitude certainty and message frame, in a structural model representing a social marketing campaign focusing on physical exercise?* To answer this question, data was gathered on elaboration and attitude certainty. (The effect of measure frame was tested by comparing groups according to the message frame received, as previously mentioned and as detailed in section 4.4 below on data analysis.)

Reynolds' (1997) scale measured elaboration via 12 indicators. This scale recording cognitive effort and evaluative processing is widely used by researchers to measure elaboration; for example, by Bolkana and Goodboy (2024). A higher average score implies that a respondent has read and thought about the message more. The results from this variable could be ambiguous, though. Low elaboration could mean (1) that the respondent has thought about the topic enough previously and is not particularly

interested in thinking more having reached processing sufficiency or (2) that the respondent has not thought about the topic previously and has opinions based on heuristics or bias. For clarification, the results from this scale were compared with those from Ryffel and Wirth's (2016) five-item scale for processing fluency. If a respondent has low elaboration and a high level of processing fluidity, the implication is that the individual has already thought about the topic and has done all the thinking he or she is prepared to do, as in case (1). If, instead, a respondent has low elaboration and a low level of processing fluidity, the implication is that the individual has not thought about the topic, as in case (2). This distinction is important as it theoretically places an individual in a different cluster (with higher fluency in cluster 4, lower fluency in cluster 3) hence explaining results for the most effective message frame in clusters, particularly in relation to the amplification and crystallisation hypotheses (Clarkson, Tormala and Rucker, 2011; Ryffel and Wirth, 2016).

A single item for attitude certainty was used as this variable can be measured accurately as a direct question. Single items are typical in research measuring attitude certainty (Tormala and Petty, 2004; Lawton, Conner and McEachan, 2009). As mentioned, variables with a single item are permissible in PLS-SEM and are neither formative nor reflective (Hair et al., 2017).

4.2.2 Observed variables

There were eight observed variables. These variables could be observed or measured without a mathematical model formed of indicators. Age and location were included to help build a sample profile of participants and to exclude participants of the wrong age and/or from an area not served by the BLMK integrated health and care system from the experiment. There were two further sample-profiling questions, on employment (to enquire whether respondents worked for the NHS) and gender. Four observed variables asked respondents to input a numerical figure for planned vigorous and moderate exercise before and after the marketing message, as part of sample-profiling and to assess whether participants were meeting, or missing, the national recommended exercising targets.

4.2.3 Pre-testing of questionnaire

Due to UK covid restrictions between March 2020 and December 2021 and its lasting effect on exercising habits, a pre-test was conducted with two postgraduate students at Manchester Metropolitan University, who offered professional one-to-one feedback on the questionnaire's readability and functionality. Following minor edits, the questionnaire was used to collect data on Facebook between 13 August and 6 December 2021, following the granting of ethical approval on 11 August 2021 by the Manchester Metropolitan University's Business and Law Research Ethics and Governance Committee (appendix 4) (Manchester Metropolitan University, 2020).

4.3 Data collection

The questionnaire (included in appendix 5) was hosted online on Qualtrics via an account provided by Manchester Metropolitan University (MMU) featuring MMU branding, as 98 per cent of the UK population is online (Statista, 2024) and, as mentioned, more than 90% of all UK ethnic groups use the internet (Gov.uk, 2019). Qualtrics allows researchers to build a survey in blocks of questions in the desired order and permits elements of programming. For this study, all questions were 'starred' as requiring answers, to gather full datasets. Most questions required respondents to record their agreement with a statement on a scale, of either 1 to 7 or 1 to 9, with 1 labelled as 'Strongly disagree and 7 (or 9) labelled as 'Strongly agree'. The responses were scored 1 to 7 (or 1 to 9) although some questions were reverse scored to prevent straight-lining by respondents and to encourage them to properly consider their answers; in such cases for 1-to-9 scales, 1 was recoded as 9, and 9 was recoded as 1, etc. Some questions asked for numerical answers, such as weekly vigorous exercise in minutes.

Before answering the survey questions, respondents were screened. They completed a consent form to agree to the anonymous data being analysed for research purposes, and confirmed that they met the age requirements for the questionnaire (19 to 64). If the requirements were not met, the survey was programmed to send respondents to a closing 'thank you' page.

Following screening, respondents were given brief information about NHS national exercising recommendations. They answered questions in an order designed to provide the required data for responding to the research questions. Firstly, respondents were asked to input how many minutes of vigorous and moderate exercise they planned to do over the next seven days, to test whether respondents were currently meeting the NHS's national recommendations. Via questions relating to individual indicators, they reported their pre-message levels of cognitive attitude and affective attitude (to ascertain whether initial attitude bases were predominantly cognitive or affective), behavioural intention (to use as the control variable in the structural model) and attitude certainty (a moderating variable for clustering).

Following this they were shown one of four message frames at random. Qualtrics was programmed so that respondents only saw one of the sets of text representing the four message frames within a separate question block, using the 'randomised' function. Each respondent had a 25% chance of receiving one of the four messages. In terms of content category, the four message frames were cognitive positive, cognitive negative, affective positive and affective negative. The abbreviations CP, CN, AP, AN were recorded in each row of the final results spreadsheet to indicate which message a respondent had read, to facilitate the division of results into groups. Assigning a random message frame ensures that correlations between an outcome and a treatment are causal (Antonakis et al. 2010) and are not due to factors not included in the experiment, such as gender or age, which will be equally distributed across groups. Hence for the behavioural intention construct, differences in pathway parameters between groups within a cluster are due to the message frame issued within clusters. Indeed, the accepted benchmark for causal inference is the randomised experiment

(Koschate-Fischer and Schandelmeier, 2014). The four message frames were taken from existing public information available on NHS websites, as shown in appendix 5. To facilitate a manipulation check, two questions asked respondents to report whether their marketing message was more emotional or more cognitive, and more positive or more negative, so that these groups of respondent could be tested mathematically for statistically significant differences (Bryman and Bell, 2007; Pallant, 2016).

Following the manipulation check, respondents reported their post-message levels of variables: elaboration likelihood (a moderating variable used for clustering), cognitive attitude, affective attitude, behavioural intention, subjective norm, self-efficacy, belief (that doing physical exercise is likely to help one lead a healthier and happier life) and six emotions (happiness, sadness, fear, guilt, gratitude and anger). New levels of attitude certainty were measured to test for post-message improvements in attitude certainty. Following a brief explanation of the BLMK integrated health and care system, respondents then reported their post-message levels of OPR with the BLMK (via indicators for capability, integrity, dependability, affective trust and control mutuality).

Respondents were also asked to input post-message intended levels of vigorous and moderate exercise for the next seven days in minutes, to check for evidence of a customer journey when compared to pre-message levels. Finally, following three demographic questions to build a profile of respondents (gender, location and enquiring whether they worked for the NHS), respondents were sent to the ‘thank you’ page as the survey had been completed.

4.4 Data analysis

The quality of the primary data was analysed using SPSS, to compile descriptive statistics and test for common method bias, before a series of t-tests provided a message-framing manipulation check, confirmed the quality of the clustering, and tested for interesting results in the data. To facilitate the tests, the data was divided up as follows:

- one model contained the results of all respondents **(group 1)**.
- four models divided all respondents by the marketing message received in a 2 (cognitive/affective) x 2 (valence positive/negative) analysis **(groups 2 to 5)**.
- 16 models firstly clustered respondents by attitude certainty and elaboration likelihood using median splits (DeCoster, Gallucci and Iselin, 2011) to create four clusters. These four clusters were named cluster 1, cluster 2, cluster 3 and cluster 4. They were then divided by the message frame delivered. This resulted in a 2 (attitude certainty high/low) x 2 (elaboration likelihood high/low) x 2 (cognitive/affective) x 2 (valence positive/negative) analysis, as shown in table 4.3 below **(groups 6 to 21)**.

	Message frame received	
	Initial attitude certainty low	Initial attitude certainty high
Elaboration high	CLUSTER 1 GROUPS	CLUSTER 2 GROUPS
	6) Affective negative 7) Affective positive 8) Cognitive negative 9) Cognitive positive	10) Affective negative 11) Affective positive 12) Cognitive negative 13) Cognitive positive
Elaboration low	CLUSTER 3 GROUPS	CLUSTER 4 GROUPS
	14) Affective negative 15) Affective positive 16) Cognitive negative 17) Cognitive positive	18) Affective negative 19) Affective positive 20) Cognitive negative 21) Cognitive positive

Table 4.2: How the data is divided into 16 groups in a 2x2x2x2 analysis.

4.4.1 Descriptive statistics

Descriptive statistics were compiled using the full dataset: mean, median, minimum, maximum, standard deviation, skewness and excess kurtosis. The values for skewness and excess kurtosis were used to check whether the distributions of variables used in the measurement and structural model deviated substantially from normal distributions (absolute value of skewness more than 3 and excess kurtosis more than 10), as this could distort the results (Hair et al., 2017; Kline, 2011). The values for skewness and excess kurtosis were also checked for variables used in t-tests, which must have a normal distribution (absolute value of skewness approximately less than 1) (Bryman and Bell, 2007). Several observable variables were used to create a sample profile of respondents (age, gender, location, employment, levels of physical exercise).

4.4.2 Common method bias

A test for common method bias was conducted, using the variance inflation factor (VIF) statistics (Kock, 2015), to check for inflated relationships between variables. This test analyses whether respondents have been biased by the way the questions have been presented in the questionnaire, by quantifying the correlation between predictors in a model. A common alternative approach, Harman's single-factor test, which considers the effect of a single variable as a predictor of all model indicators in an exploratory factor analysis, has been criticised as a technique that fails to partial out method effects (Podsakoff et al., 2003) given that there can be more than one source of method bias.

4.4.3 Outliers

Responses from those who live outside of Bedfordshire were checked using Qualtrics, to see if respondents were still served by the same integrated healthcare system, in which case responses were retained. Analysis was then conducted to exclude outliers (inconsistent responses) from the dataset. Responses containing the intentional reporting of incorrect data (such as straight-lining) and suspicious patterns (such as rare and unlikely combinations of indicator values due to the misunderstanding of a question) should be discounted. However, outliers that are considered genuine responses should be retained (Sarstedt and Mooi, 2014; Hair et al., 2017).

4.4.4 t-tests

A series of t-tests was conducted. A t-test investigates how significant the differences are between the means of two groups for normally distributed data to test if the groups are from separate populations (Bryman and Bell, 2007; Pallant, 2016; Rowntree, 2018).

- Manipulation checks were conducted on the full dataset, to see if there was a statistically significant difference between assessments of negative/positive message-framing and cognitive/emotional message-framing.
- Tests confirmed the quality of the clustering into four clusters via median splits of results for elaboration likelihood and initial attitude certainty. Two tests checked for statistically significant differences: between results in the elaboration likelihood low and high categories, and between results in the high and low initial attitude certainty categories.

- An additional t-test investigated if there was a statistically significant difference between the processing fluency of those with low initial attitude certainty and those with high initial attitude certainty. This result was useful within the discussion of results, specifically to identify whether respondents were experiencing effects due to the amplification hypothesis (low processing fluency) or crystallisation hypothesis (high processing fluency).
- Final t-tests checked for statistically significant differences between initial attitude certainty (measured before the issuing of the marketing message) and new attitude certainty (measured after the issuing of the marketing message) within the clusters, to look for evidence of a customer journey between clusters, for example from cluster 1 to cluster 2, and from cluster 3 to cluster 4.
- As initial vigorous exercise was not normally distributed, a Mann-Whitney U test was conducted (Pallant, 2016) to test for a significant difference between the initial vigorous exercise of those with low initial attitude certainty and those of high initial attitude certainty, for evidence of a customer journey.

Further analysis then identified key constructs (answering RQ1) and assessed the effect of moderators (answering RQ2) to respond to RQ3: *What are the most effective pathways to improving behavioural intention within such a structural model representing a social marketing campaign focusing on physical exercise?* Smart PLS was used to examine the role of variables within 21 structural equation models based on the measurement model (figure 3.1 on page 201). SEM is covered in the following chapter.

5. Structural equation modelling

5.1 Introduction

PLS-SEM is a second-generation statistical technique, building on first generation techniques such as multiple linear regression and analysis of variance (ANOVA). It operationalises indicators as weighted composites to create proxies for the latent variables in the SEM. A series of ordinary least square regressions are performed using these proxies to minimise the sum of the square of the error terms of the endogenous variables they predict (Wold, 1985; Johnson and Wichern, 1988; Vinzi, et al., 2010, Hair et al., 2017; Hair, et al., 2024). PLS-SEM is ideal for a complex measurement model with many indicators and smaller sample sizes. Smart PLS “can handle models of almost any size, including those with dozens of constructs” (Hair et al., 2017:29).

This chapter is structed as follows. Section 5.2 sets up the measurement model and outlines the procedure for importing and organising the corresponding data files in Smart PLS 4. Section 5.3 describes the procedure for running the PLS-SEM algorithm to test and establish the measurement model, and for running bootstrapping to check for significant significance between constructs to test the structural model via the testing of a series of research hypotheses. Then it describes the procedure for conducting moderator analysis and bootstrapping multigroup analysis to test further research hypotheses to meet the research aim.

5.2 Setting up the measurement model

Firstly, a new project was created in Smart PLS called ‘Full dataset’. Within this project a new model was created called ‘All data’ to represent group 1. The structural (inner) model was constructed in Smart PLS, by dragging and dropping latent variables into the work area one at a time from the latent variable icon in the top ribbon. Nineteen latent variables were created and named, as shown in figure 5.1 below: control mutuality (CMU), integrity (TCI), dependability (TCD), capability (TCC), affective trust (TAF), belief (BEL), new cognitive attitude (NCA), new affective attitude (NAA), attitude (ATT), self-efficacy (SEF), subjective norm (SJN), anger (ANG), fear (FER), happiness (HAP), sadness (SAD), guild (GLT), gratitude (GRA), new behavioural intention (NBI), initial behavioural intention (IBI). These variables were identified in the literature reviews and resulting conceptual model in chapter 2. Once in place in the Smart PLS workspace, they were connected according to the research hypotheses using the ‘connect’ tool, to replicate the latent variables, represented as circles in figure 5.1 below. The data file containing all responses (once screened for outliers) was imported to Smart PLS as a .csv file, before being partitioned into four data groups within Smart PLS according to message frame received: affective negative, affective positive, cognitive negative, cognitive positive.

With the ‘All data’ model open, the appropriate indicators were highlighted and pulled over from the list of variables in the left window to form the measurement (inner) model shown in figure 5.1. Each indicator represents a question in the survey. For example, the responses to TCC1 and TCC2 were pulled across together, and dropped into the cognitive trust element capability (TCC) to then appear as yellow indicators TCC1 and

TCC2. Attitude (ATT) was set up as a second order variable by including all four attitude indicators (NAC1, NAC2, NAA1, NAA2) as detailed below in section 5.3. To colour-code the variables, the OPR constructs were coloured green, the RAA constructs blue, the emotions grey and the control variable red. When completed, the model was copied four times for groups 2 to 5, with each copy renamed to match the group name and data set that will be used in the model (2 affective negative, 3 affective positive, 4 cognitive negative, 5 cognitive positive).

Four additional projects were created for the four clusters called ‘Cluster 1’, ‘Cluster 2’, ‘Cluster 3’ and ‘Cluster 4’ to house groups 6 to 21. Four data files representing the respondents in the four clusters (having been formed via median splits of initial attitude certainty and elaboration likelihood) were then imported into these projects as .csv files. Each of these four files was again partitioned according to the four message frames in each cluster within Smart PLS. The model constructed above for the ‘All data’ project was then copied 16 times for groups 6 to 21, with four copies moved into each cluster, again renamed to match the group name and data that will be used in the model. The full project and model set-up is included in table 5.1 below.

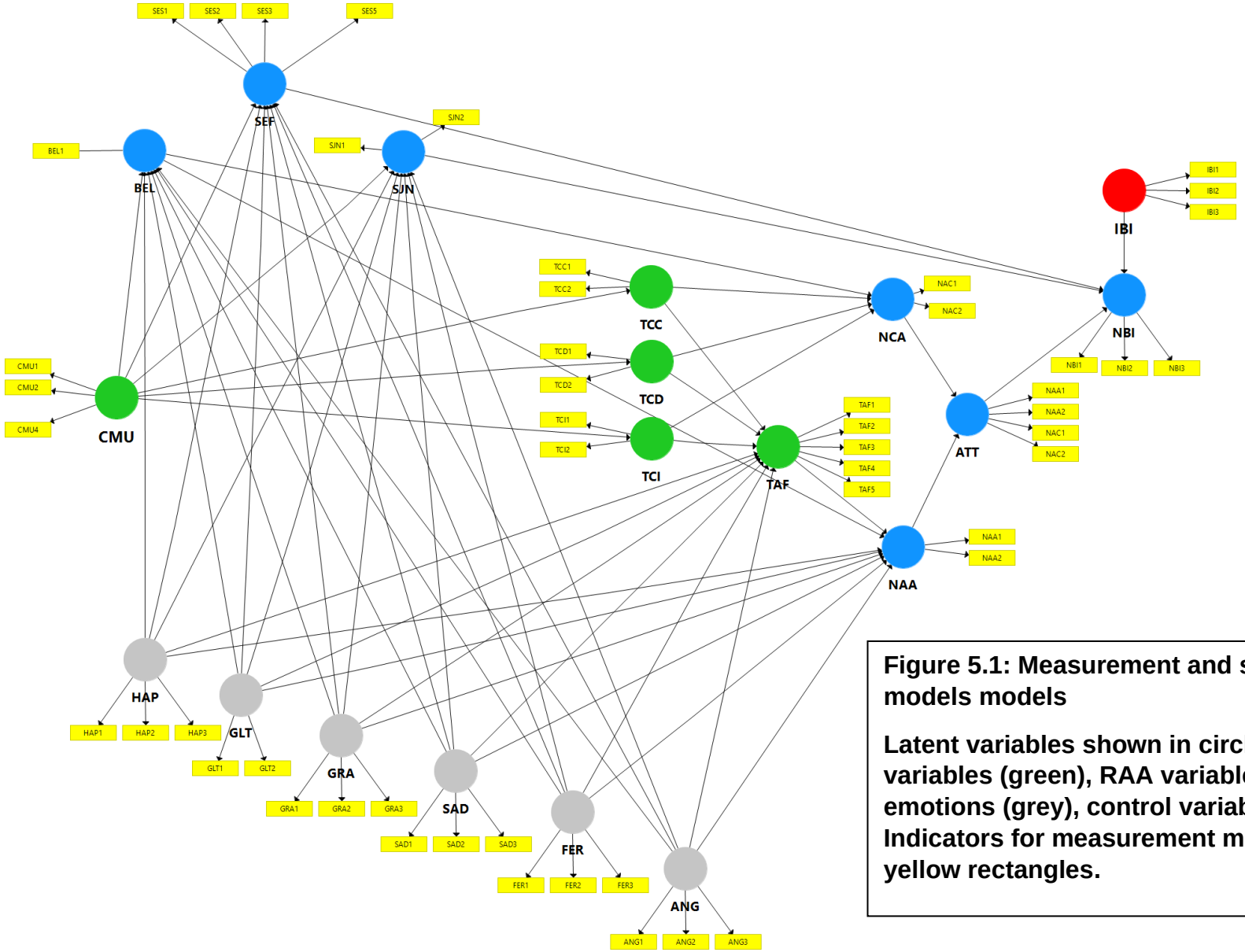


Figure 5.1: Measurement and structural models models

Latent variables shown in circles: OPR variables (green), RAA variables (blue), emotions (grey), control variable (red). Indicators for measurement model shown as yellow rectangles.

Project name	Model name
Full dataset	1 All data
	2 affective negative
	3 affective positive
	4 cognitive negative
	5 cognitive positive
Cluster 1	6 affective negative
	7 affective positive
	8 cognitive negative
	9 cognitive positive
Cluster 2	10 affective negative
	11 affective positive
	12 cognitive negative
	13 cognitive positive
Cluster 3	14 affective negative
	15 affective positive
	16 cognitive negative
	17 cognitive positive
Cluster 4	18 affective negative
	19 affective positive
	20 cognitive negative
	21 cognitive positive

Table 5.1: Project and model set-up within Smart PLS 4

5.3 Using Smart PLS 4

To test the measurement and structural models, systematic evaluation of the PLS-SEM results took place in two stages (Hair et al., 2017) via the examination of a series of reported test results as listed below (Cronbach, 1951; Fornell and Larcker, 1981; Cohen, 1988; Belsley, 1991; Chin, 1998; Raykov, 2004; Biau, Jolles and Porcher, 2010; Henseler, Ringle and Sarstedt, 2015).

Stage 1. Evaluation of measurement model, examining the relationship between constructs and their observed indicators:

- internal consistency reliability (intercorrelations of observed indicator variables, to test how a questionnaire measures what it is supposed to measure) via values for **Cronbach's alpha** and **composite reliability**.

- convergent validity (extent a measure correlates positively with alternate measures of the same construct, also referred to as indicators) via measures of **indicator reliability**, **average variance extracted (AVE)**.

- discriminant validity (extent a construct is distinct from other constructs) via measures of **heterotrait-monotrail ratio (HTMT) confidence interval**, **Fornell-Larcker criterion** and **crossloadings**.

Stage 2: Evaluation of structural model, examining the relationships between the latent constructs in the model.

- **Variance inflation factor (VIF) values** were used to test for the collinearity of inner reflective constructs (as when two variables are correlated so strongly, it is difficult to estimate their individual regression coefficients reliably).

- **R^2 coefficient of determination** was used to gauge the influence of predictors on a construct, and to calculate the path coefficient for the influence of extraneous variables (those not included in this study) on new behavioural intention using the formula $\sqrt{(1-R^2)}$.

- **p measure of statistical significance** and **f^2 effect size** were used to test for significant and meaningful relationships in the structural model when compiling the 21 path diagrams. A number of randomly drawn bootstrapping subsamples within the data were used to form a distribution of samples for all structural path coefficients so that p could be calculated from the resulting standard errors of the distributions, to be compared with the required significance level of 5%. f^2 was calculated as the effect on R^2 when a predictor variable is removed from the model.

- **standardised path coefficients** (calculated by Smart PLS using z scores for variables based on means and standard deviations) were used to assess the total effect of constructs on new behavioural intention

and for multi-group analysis, to assess the relative effectiveness of the four message frames within the clusters.

- **predictive relevance Q^2** figures were used to assess whether a path model accurately predicts data not used in the model estimation, an iterative process that omits various data points in an endogenous construct's indicators, to compare the re-estimated model using predictions for the missing data with the true model a set number of times, to arrive at a figure for Q^2.

Of the algorithm options, the PLS-SEM algorithm was used for this research, as is appropriate when a model is not purely reflective, when corrections for bias due to the potential over-estimating of loadings are not required via the alternative Consistent algorithm. Belief, with only one indicator, was neither reflective nor formative (Hair et al., 2017). Attitude is a reflective-formative hierarchical component as shown in figure 5.1, the formative aspect originating from the fact that cognitive attitude and affective attitude are not a common cause of attitude (Byrne, 2016; Hair et al. 2017). The first order components (cognitive attitude and affective attitude) provide valuable information about the influence of OPR constructs on cognitive attitude and affective attitude; the second order component (attitude) simplifies and maximises the predictive performance of the model when analysing influences on new behavioural intention within the RAA (Dubé, Cervellona and Jingyuan, 2003; Gün and Bulut, 2023).

The path weighting system was selected. This system prioritises the structural model (the relationships between latent variables) above the measurement model within calculations, to provide the highest figures for observed variance for constructs with reliable results. Otherwise, default settings were deemed to be appropriate within this research context, such as (1) using standardised data for indicators to produce standardised path coefficients for every relationship for accurate comparisons, and (2) a maximum of 300 iterations of the algorithm, generally adequate for the algorithm results to converge and stablise at the optimal weighting of indicators (Hair et al., 2017; Ringle, Wende and Becker, 2024).

5.3.1 Establishing the measurement model

To establish this study's measurement model, the Smart PLS algorithm was run from the 'Calculate' menu in the 'All data' model, using the full dataset. This obtained test results for internal consistency (Cronbach's alpha, composite reliability), convergent validity (indicator reliability, average variance extracted) and discriminant validity, for each construct. The results were found in the 'Outer loadings' and 'Construct reliability and validity' sections of the resulting report.

To find corresponding data for the construct elaboration likelihood (ELM), a construct named ELM was temporarily created in the model as a predictor of behavioural intention. This was deleted once the measurement model results for ELM were obtained. Results establishing the measurement model are reported in chapter 6.

The same tests were not required within the four clusters for the other groups, as the constructs have already passed tests for reliability and validity, and Smart PLS configuration settings were the same when testing the structural model in the 21 groups (Hair et al., 2017; Cheng and Espanha, 2023; Ismael and Duleba, 2021).

5.3.2 Testing the structural model

To test the hypotheses in the structural model, the Smart PLS algorithm and bootstrapping functions were run for each of the 21 groups, with the required data for the group selected in each case. In this study the recommended 5,000 sub-samples were examined for statistically significant relationships via bootstrapping for a high level of accuracy. Otherwise, default settings were selected. Results were recorded for the coefficient of determination (R^2, the percentage of variance of a variable captured by predictor variables), statistical significance of relationships (p), effect size (f^2) and standardised beta coefficients (β, the strength of relationships). These results were found in the 'Path coefficients', 'f-square' and 'R-square adjusted' sections of the report. Statistically significant ($p<=0.05$) and meaningful ($f^2>0.02$) relationships between constructs were retained in models, the rest deleted to find the simplest and most parsimonious way of expressing the observed variance in constructs (Hair et al., 2017), as shown in the 21 path diagrams for the 21 groups in appendix 13.

The PLS Predict procedure was run from the 'Calculate' menu to obtain results for predictive relevance for various constructs, such as the dependent variable new behavioural intention (Q^2) using default settings, with results reported in chapter 6.

5.3.3 Moderator analysis and multigroup analysis

To calculate the moderator effects of elaboration likelihood and attitude certainty, moderating relationships were added for the relationships of interest on a further copy of the full measurement model within the 'Full dataset' project, using the 'Moderating effect' tool. Moderating relationships were drawn using the 'connect' tool between new behavioural intention and its predictors, and between belief, new cognitive attitude, new affective attitude and affective trust and their predictors, to help assess the effect of OPRs. Moderator analysis with binary variables for elaboration likelihood and initial attitude certainty was conducted (1=high, 0=low). The binary values had been created in separate columns in the full dataset file. For example, within the file, an individual with low values of elaboration likelihood and attitude certainty (as designated by the median splits) would score 0 in both of the new columns. Hence within Smart PLS elaboration likelihood and attitude certainty had a single indicator each that was pulled over from the data window into the model. Binary data can be ordinal (Ringle et al., 2023) and have been used in path models in a variety of research areas (Becker et al., 2023). Once the PLS-SEM and Bootstrapping algorithms were run, the results for path coefficients and statistical significance for moderator effects were found from the resulting reports, as before.

To compare the moderator effect of message framing, five additional models were created containing only the five constructs of interest and their predictors, along with their indicators: new behavioural intention (within the full dataset project), and belief, affective trust, new cognitive attitude and new affective attitude (within the cluster 3 project). Figure 5.2 below illustrates the model for the new behavioural intention

construct. The full dataset project model was copied into the four projects for the clusters and renamed. Starting again from the 'Calculate' menu, bootstrapping multigroup analysis (suitable for non-parametric data in groups of dissimilar sizes) was then run for each newly created model in each project, with all four data groups (AN, AP, CN, CP) selected in each case to investigate differences for coefficients between message frames. Message frames were compared in pairs within the results table, leading to six contests between path coefficients (ANvAP, ANvCN, ANvCP, APvCN, APvCP, CNvCP). One-tailed tests were conducted to investigate whether one path coefficient was higher than the other within the pairs (for example, for the relationship between initial behavioural intention and new behavioural intention). Statistical significance was set at 0.10, to reduce the risk of rejecting a significant difference (Hair et al., 2017; Rowntree, 2018). Otherwise, the default settings were used.

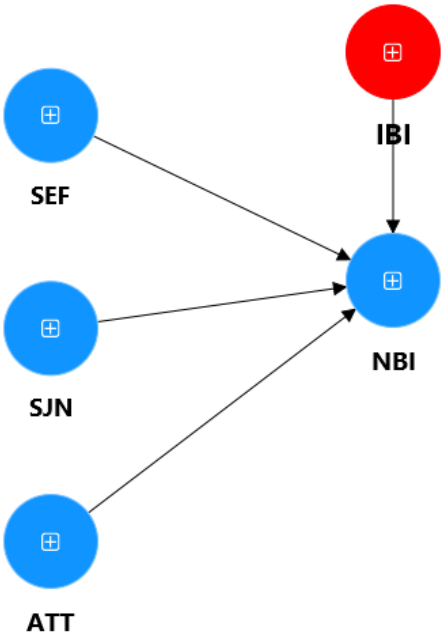


Figure 5.2: Model used to test for moderator effects of message frame in new behavioural intention construct

For simplicity, indicators are not shown. SEF=self-efficacy, SJN=subjective norm, ATT=attitude, IBI=initial behavioural intention, NBI=new behavioural intention.

Differences between path coefficients and the statistical significance of these differences were obtained from the ‘Path coefficients’ section of the report generated. For the belief, affective trust, new cognitive attitude and new affective attitude constructs, the significant differences between coefficients were simply added up to find the most effective message frame in a pair. For one message frame to emerge strongest, one message frame must beat the other three. However, within the new behavioural intention construct, the sign of the coefficient difference for initial behavioural intention was reversed in calculations, to reflect that high values for the difference reflects less successful message frames, if respondents are merely heavily influenced by previous exercising intensions.

The results of all calculations are included in chapter 6.

6. Results and analysis

6.1 Introduction

This chapter is structured as follows. Section 6.2 examines the quality of the data and clustering, presents the findings of a manipulation check, and summarises key descriptive statistics, before establishing the measurement model. Hypotheses are tested in section 6.3 before the research questions are answered in section 6.4, to establish which of the 21 models included OPR dimensions, and to calculate the relative strength of those variables with respect to other exogenous variables in the structural model. A final section 6.5 lists other interesting findings that are used to enrich the discussion in chapter 7.

6.2 Data analysis

There were 919 recorded responses (that progressed to a ‘thank you’ page) with 807 fully completed surveys; 112 did not count as fully completed surveys due to respondents being outside the age range or because they did not complete the consent form (hence these 112 people were taken straight to the ‘thank you’ page). A total of 1,369 other respondents started but did not finish the survey and these responses were discarded as it was important for respondents to answer all questions.

6.2.1 Data screening

Firstly, the data was examined for outliers. Barnett and Lewis (1984:4) define an outlier as an “observation (or subset of observations) which appears to be inconsistent with the remainder of that set of data”. A visual inspection revealed that 14 of the 807 responses contained outliers due to a result comparing unfavourably with that of a related variable. They were discarded. They are itemised now briefly.

Five of these 14 responses were discarded as respondents had given lower scores for new behavioural intention than initial behavioural intention following the marketing message. As the survey asked respondents about their intention to do physical exercise over the next seven days, it was assumed that it was not actually possible for these five respondents to exercise normally during that period (perhaps they were planning to be on holiday). Their responses were deemed the result of a data collection error (Bryman and Bell, 2007), as the questionnaire did not filter out those who were not able to exercise the following week for lifestyle reasons.

In nine of the 14 discarded responses, participants intentionally reported incorrect data. Of these nine, seven responses were discarded that had reported 1 for belief, due to straight-lining across variables. The two final responses were discarded as they had answered the opposite values of 1 and 7 for the two indicators measuring new cognitive attitude, which was not logical. Responses containing suspicious patterns such as straight-lining or rare combinations of indicator values (perhaps due to the misunderstanding of a question) should be deleted (Hair et al., 2017).

Outliers are often defined as results more than three standard deviations above or below the mean as measured by z scores (Leys et al., 2013). The z scores were checked for all results for the remaining 793 responses. There were a small number of cases of z scores being outside of this range for indicators of cognitive attitude, behavioural intention, attitude certainty, anger, belief and processing fluidity. In most cases, though, the absolute values of those z scores greater than 3 were between 3 and 3.5. This method of outlier detection was rejected, as extreme values should be retained if they represent an element of the population (Hair et al., 2017). There are also mathematical problems associated with this method of outlier detection. It assumes distributions are normal (Leys et al., 2013), which is not the case for the variables cognitive attitude and belief, as shown in the descriptive statistics in appendix 9.

The final total of 793 completed responses ensured that the sample was a large enough sample of the total population of 400,000 adults (ONS, 2019) in the area to ensure a confidence level of 99% and a confidence interval of 5% (Qualtrics, 2020). The total of 793 responses also ensured that there was enough data for analysis within the 21 groups (Hair et al., 2017). The number of respondents per group appears in table 6.1.

Full dataset	Group	Message received	Number of responses
All data	1	One of four messages	793
All data grouped by marketing message	2	Affective negative	196
	3	Affective positive	211
	4	Cognitive negative	200
	5	Cognitive positive	186

All data divided into groups	Group	Message received	Number of responses
Cluster 1: ELM High Uncertain Attitude	6	Affective negative	47
	7	Affective positive	32
	8	Cognitive negative	59
	9	Cognitive positive	49
Cluster 2: ELM High Certain Attitude	10	Affective negative	60
	11	Affective positive	54
	12	Cognitive negative	56
	13	Cognitive positive	58
Cluster 3: ELM Low Uncertain Attitude	14	Affective negative	38
	15	Affective positive	53
	16	Cognitive negative	47
	17	Cognitive positive	39
Cluster 4: ELM Low Certain Attitude	18	Affective negative	51
	19	Affective positive	72
	20	Cognitive negative	38
	21	Cognitive positive	40
		TOTAL	**793**

Table 6.1: The number of responses in the 21 data groups

6.2.2 Descriptive statistics

Descriptive statistics for the full dataset were generated in Smart PLS. A sample profile of respondents appears in appendix 8, summarised in section 6.2.2.1. Descriptive statistics for other variables appear in appendix 9, where statistics are given for mean, median, minimum values, maximum values, standard deviation, kurtosis, skewness. Results for skewness and kurtosis are explored in section 6.2.2.2.

6.2.2.1 Sample profile

Within appendix 8, the mean age of the 793 responses (M=45.6) compares favourably to the mean ages of 42.4 in Central Bedfordshire, 40.1 in Luton and 42.2 years in Bedford (ONS, 2019). More females than males took part in the experiment: 173 males (22%) versus 613 females (77%) with five respondents reporting their gender as neither male nor female (1%). This is a similar gender breakdown to that of *Better Health* campaign respondents, as reviewed in chapter 1 (Public Health England, 2021c).

A total of 776 of 793 (98%) respondents lived in Bedfordshire (Bedford, Central Bedfordshire, Luton) due to the regional targeting of the Facebook advertisement. The remaining 17 respondents (2%) lived in the area covered by the BLMK integrated care system, as reported by Qualtrics, hence their responses were retained, as their answers to OPR questions on the BLMK integrated healthcare system were relevant.

Approximately 8% of respondents worked for the NHS, against a national figure of approximately 5% (The King's Fund, 2022; Statista, 2022).

When scores for vigorous and moderate exercise in pre-marketing message exposure conditions were examined (with minutes of vigorous exercise doubled and added to minutes of moderate exercise), 209 were below the national guidelines (26%). This compares to national NHS statistics that state that 22% of the population is inactive (NHS, 2018) and local government statistics stating that 25% of the regional population is inactive (Central Bedfordshire Council, 2020). In pre-message exposure conditions, a majority of respondents performed less than 75 minutes of vigorous exercise per week (M=85.57, Med=60).

Most respondents had a net cognitive attitude. Their score for cognitive attitude was higher than their score for affective attitude. Only 31 out of 793 (4%) respondents had a net affective attitude, and for 22 of them the difference was only 0.5 (on scales of 1 to 7). This PhD research study therefore assumes all 793 respondents have dominant cognitive attitudes, due to likely errors in self-reporting.

6.2.2.2 Skewness and kurtosis

Although Smart PLS does not require parametric data, Hair et al. (2017) recommend tests for skew and excess kurtosis to safeguard the accuracy of results. All of the absolute values for skew and kurtosis results for indicators within the measurement model were within the limits recommended by Kline (2011) in a guide to structural

equation modelling: skewness <3, kurtosis <10. For the constructs in the structural model, the absolute values for skew fall within the following range: min=0.04, max=2.91. The results for kurtosis were in the following range: min=0.02. max=9.78. The full results are shown in full in appendix 9.

However, normal distributions are required for t-tests (Bryman and Bell, 2007) with the recommendation that absolute values for skew and kurtosis recommended should be approximately <1 (Hair et al., 2017). The variables being used for t tests within this PhD study are: perception of positive/negative message valence framing, perception of emotional/cognitive message content, elaboration likelihood, attitude certainty, and processing fluency. The table of descriptive statistics in appendix 9 demonstrates that the absolute values for skew for these five variables fall within the following range: min=0.04, max=1.42. The absolute values for kurtosis for these five variables fall within the following range: min=0.27, max=1.04. Hence it was deemed that there were no prohibitive problems of skewness or excess kurtosis for the variables being tested using t-tests.

6.2.3 Common method bias

A test for common method bias was run using the collinearity statistics produced by Smart PLS, to check for inflated relationships between variables. This test analyses whether respondents have been biased by the way the questions have been presented in the questionnaire. The inner VIF values, reported in appendix 12, met the necessary threshold of being below 5 for all constructs within PLS-SEM (Kock, 2015) hence common method bias was not present.

6.2.4 Manipulation checks and quality of clustering

A series of t-tests were conducted for manipulation checks and to check the quality of data clustering.

6.2.4.1 Manipulation checks

Manipulation checks were conducted using SPSS to test how questionnaire respondents categorised the marketing message they received: positive/negative valence on a scale of 1 (more negative) to 7 (more positive), cognitive/emotional content on a scale of 1 (more emotional) to 7 (more cognitive). The results of these t tests are shown in tables 1a and 1b in appendix 10 and are summarised here. There was a significant effect for respondents categorising their message as more cognitive or more emotional ($M_{cognitive}$=4.56, $M_{emotional}$=4.30, t(787)=2.22, p=0.03). There was also a significant effect for respondents categorising their message as more positive or more negative ($M_{negative}$=3.55, $M_{positive}$=5.11, t(798)=14.58, p=0.00). Hence the messages were successful in manipulating respondents as intended.

6.2.4.2 Quality of clustering

Median splits were used to divide the full dataset of 793 responses into four clusters, using elaboration likelihood (Med=4.08 on a 1 to 7 scale) and initial attitude certainty (Med=8 on a 1 to 9 scale), as described in chapter 4. Two t-tests checked the quality of the data clustering. A check was conducted to test for a statistically significant difference between the results of those clustered into high elaboration likelihood and

low elaboration likelihood. A significant effect was found ($M_{ELM-HIGH}$=4.84, $M_{ELM-LOW}$=3.87, t(789)=33.31,p=0.00) as shown in table 1c in appendix 10. A check was conducted for a statistically significant difference between those divided into low initial attitude certainty (IAC) and high initial attitude certainty. A significant effect was found ($M_{IAC-HIGH}$=8.74, $M_{IAC-LOW}$=5.38), t(409)=38.30,p=0.00) as shown in table 1d in appendix 10.

Having presented a sample profile and proven the quality of the primary data, this chapter continues with tests of the measurement and structural models.

6.2.5 Measurement model and structural model evaluation

Hair et al. (2017) recommends evaluation of PLS-SEM results in two stages:

1. Measurement model evaluation: internal consistency (Cronbach's alpha, composite reliability), convergent validity (indicator reliability, average variance extracted), and discriminant validity.
2. Structural model evaluation: collinearity of inner reflective constructs, R^2 coefficient of determination, path coefficients, f^2 effect sizes, predictive relevance Q^2.

6.2.5.1 Stage 1: measurement model evaluation

A measurement model must be established before a structural model is analysed. The measurement model was evaluated using the results in table 6.2.

Latent variable	Indicators	Convergent validity			Internal consistency reliability		Discriminant validity
		Loadings	Indicator reliability (loadings squared)	AVE (Average Variance Extracted)	Composite reliability	Cronbach's Alpha	HTMT confidence interval
Evaluation rules (Hair et al., 2017)		>0.40	>0.50	>0.50	>0.70	>0.70	Does not include 1
MODERATING VARIABLES							
Attitude certainty (ACR)	ACR	1.00	1.00	1.00	1.00	1.00	YES
Elaboration likelihood (ELM)	ELM1	0.54	0.28	0.35	0.86	0.84	YES
	ELM2	0.57	0.32				
	ELM3	0.80	0.64				
	ELM4	0.65	0.42				
	ELM5	0.47	0.22				
	ELM6	0.53	0.28				
	ELM7	0.68	0.46				
	ELM8	0.67	0.45				
	ELM9	0.67	0.45				
	ELM10	0.60	0.36				
	ELM11	0.36	0.12				
	ELM12	0.46	0.16				

OTHER VARIABLES							
New attitude certainty (NCT)	NCT	1.00	1.00	1.00	1.00	1.00	YES
Processing fluency (FAM)	FAM1	0.94	0.88	0.89	0.94	0.87	YES
	FAM2	0.95	0.90				
Initial cognitive attitude (ICA)	ICA1	0.97	0.93	0.91	0.95	0.90	YES
	ICA2	0.94	0.89				
Initial affective attitude (IAA)	IAA1	0.97	0.95	0.96	0.97	0.94	YES
	IAA2	0.97	0.94				
INDEPENDENT AND DEPENDENT VARIABLES							
Initial behavioural intention (IBI)	IBI1	0.97	0.94	0.78	0.91	0.87	YES
	IBI2	0.97	0.94				
	IBI3	0.67	0.46				
Happiness (HAP)	HAP1	0.95	0.90	0.89	0.96	0.94	YES
	HAP2	0.92	0.85				
	HAP3	0.96	0.92				
Sadness (SAD)	SAD1	0.88	0.77	0.83	0.94	0.90	YES
	SAD2	0.92	0.85				
	SAD3	0.93	0.87				
Fear (FER)	FER1	0.96	0.92	0.94	0.98	0.97	YES
	FER2	0.98	0.96				
	FER3	0.97	0.95				
Anger (ANG)	ANG1	0.87	0.79	0.87	0.95	0.93	YES
	ANG2	0.95	0.90				
	ANG3	0.96	0.92				
Gratitude (GRA)	GRA1	0.96	0.92	0.93	0.98	0.96	YES
	GRA2	0.98	0.96				
	GRA3	0.96	0.92				
Guilt (GLT)	GLT1	0.96	0.92	0.92	0.96	0.91	YES
	GLT2	0.96	0.91				

New cognitive attitude (NAC)	NAC1	0.97	0.94	0.94	0.97	0.93	YES
	NAC2	0.97	0.94				
New affective attitude (NAA)	NAA1	0.98	0.95	0.95	0.98	0.95	YES
	NAA2	0.98	0.96				
Attitude (ATT)	N/A	N/A	N/A	0.70	0.90	0.86	YES
New behavioural intention (NBI)	NBI1	0.94	0.88	0.76	0.91	0.84	YES
	NBI2	0.94	0.89				
	NBI3	0.72	0.52				
Belief (BEL)	BEL1	1.00	1.00	1.00	1.00	1.00	YES
Self-efficacy (SEF)	SES1	0.86	0.74	0.60	0.88	0.82	YES
	SES2	0.84	0.70				
	SES3	0.81	0.65	(0.69)*	(0.90)*	(0.85)*	
	SES4	0.55	0.30				
	SES5	0.77	0.58				
Subjective norm (SJN)	SJN1	0.97	0.94	0.95	0.97	0.94	YES
	SJN2	0.98	0.96				
Control mutuality (CMU)	CMU1	0.89	0.79	0.64	0.86	0.78	YES
	CMU2	0.92	0.85				
	CMU3	0.31	0.10	(0.83)**	(0.94)**	(0.90)**	
	CMU4	0.91	0.82				
Cognitive trust: capability (TCC)	TCC1	0.93	0.86	0.87	0.93	0.85	YES
	TCC2	0.93	0.87				
Cognitive trust: integrity (TCI)	TCI1	0.93	0.87	0.87	0.93	0.85	NO (TDI)
	TCI2	0.94	0.88				
Cognitive trust: dependability (TCD)	TCD1	0.95	0.90	0.91	0.95	0.90	YES
	TCD2	0.95	0.91				
Affective trust (TAF)	TAF1	0.82	0.67	0.67	0.91	0.88	YES
	TAF2	0.87	0.76				
	TAF3	0.72	0.52				
	TAF4	0.84	0.71				
	TAF5	0.84	0.71				

Table 6.2: Stage 1: measurement model evaluation

*=values when SES4 removed **=values when CMU3 removed

Within table 6.2, the indicators of the dependent and independent variables meet the necessary criterion regarding **convergent validity** to be included in the measurement model (loadings >0.70) (Hair et al., 2017), except for SES4 and CMU3 (loadings shown in red). These indicators were deleted as this led to an increase in internal consistency reliability. Therefore, they do not appear in the final measurement model.

For the clustering variables and other variables, the results are also acceptable. Although AVE for ELM (elaboration likelihood) is low (0.35) based on indicator loadings, it is still acceptable as composite reliability is greater than 0.6 (at 0.86), hence the convergent validity of the construct is still adequate (Fornell and Larcker, 1981). Hair et al. (2017) acknowledge that only indicators with outer loadings <0.40 should definitely be eliminated. As only one indicator is marginally <0.40 (ELM11=0.36), no ELM indicators have been deleted. In calculations, the deletion of elaboration likelihood indicators did not lead to increases in internal consistency reliability, hence all 12 indicators were retained.

The results for **internal consistency**, **reliability** and **discriminant validity** in table 6.2 were acceptable. Although HTMT confidence intervals for the TCI-TCD relationship included 1, both TCI and TCD passed alternative tests for discriminant validity, as shown in appendix 11: the crossloadings table shows that indicator loadings for TCI and TCD are greater than crossloadings on other constructs, while the Fornell-Larcker criterion table shows that the square root of the AVE for both TCI and TCD are greater than the highest correlation with other constructs.

Collectively the results in 6.2.5.1 establish the measurement model.

6.2.5.2 Stage 2: structural model evaluation

Following the acceptance of the measurement model in stage 1, the structural model was tested in stage 2. Results for **collinearity** for the variables appearing in the structural equation analysis are shown in appendix 12. It can be seen from appendix 12 that the test for collinearity was passed for all variables, with all inner variance inflation factor (VIF) values <5 (Hair et al., 2017). Structural model evaluation continues with the testing of the research hypotheses set in chapter 2 in section 6.3.

6.3 Hypothesis testing

A total of 21 structural equation models were created to test the hypotheses in stage 2. The R^2 coefficient of determination, standardised path coefficients and f^2 effect sizes (effects of predictors) were used when compiling the final path diagrams for the 21 models. Only significant ($p<=0.05$) and meaningful ($f^2>0.02$) relationships between variables were retained. The resulting 21 diagrams appear in appendix 13. They were used alongside tables of results in Smart PLS to test the hypotheses in this section and to answer the research questions in section 6.4.

As OPR dimensions affective trust and cognitive attitude (both dimensions influenced by the three cognitive elements of trust) and new behavioural intention (the dependant variable) are of special interest in this PhD research study to answer research questions and meet research aims, detailed results for the R^2 coefficient of

determination, standardised path coefficients, f^2 effect sizes (effects of predictors) and predictive relevance Q^2 are included in tables in the following sections for these constructs for all 21 models. A brief guide to the columns in the tables is as follows:

- R^2 measures the percentage of variance of a variable captured by predictor variables. R^2 for new behavioural intention for most of the 21 models is moderate (>0.50) or high (>0.75) (Hair et al., 2017).
- The standardised beta path coefficients are the portions of variance accounted for by predictors.
- These standardised beta coefficients are accompanied by a path coefficient for extraneous variables – which represent the remainder of the variance not accounted for by predictor variables (Wuensch, 2012; Pedhazur, 1982).
- f^2 measures the change in R^2 when an exogenous variable is removed from the model with the following being seen as an authoritative interpretation of effect size: 0.02 small effect, 0.15 medium, 0.35 large (Hair et al., 2017).
- Q^2 measures a model's ability to predict data not used in the model estimation: Q^2 values >0 indicate that the model has predictive relevance (Hair et al., 2017). The tables show that generally predictive relevance for the 21 models is acceptable for the constructs.

Hypotheses including OPR dimensions (H1a to H4b, H8) are tested in section 6.3.1; hypotheses including RAA constructs (H7a to H7f, H9a and H9b, H11a to H11d) are tested in section 6.3.2; hypotheses including moderators (H5a to H5c, H10a to H10c, $H6a_1$ to $H6d_2$) are tested in section 6.3.3; and hypotheses including matching effects (H12a to H12d, H13a to H13d) are tested in section 6.3.4.

6.3.1 OPR

Due to being of high interest to this PhD research study, hypotheses including OPR dimensions are tested for the full dataset and for the individual clusters on pages 248 to 261, with the groups being examined highlighted in the section headings.

The hypotheses are as follows:

H1a Control mutuality positively influences capability

H1b Control mutuality positively influences dependability

H1c Control mutuality positively influences integrity

H2a Capability positively influences cognitive attitude

H2b Dependability positively influences cognitive attitude

H2c Integrity positively influences cognitive attitude

H3a Capability positively influences affective trust

H3b Dependability positively influences affective trust

H3c Integrity positively influences affective trust

H4a Affective trust positively influences affective attitude

H4b R^2 for affective attitude is higher when affective trust is included as a dimension of OPR

H8 Control mutuality positively influences belief

6.3.1.1 All data (group 1)

Smart PLS results indicate that H1a, H1b and H1c are accepted for all data in group 1 as control mutuality positively influences integrity, dependability and capability.

H2a, H2b and H2c are rejected in the full dataset in group 1 as capability, dependability and integrity do not influence cognitive attitude, as shown in table 6.3b.

H3a and H3c are rejected for all data in group 1 as capability and integrity do not influence affective trust, as shown in table 6.3a. However, H3b is accepted, as dependability does positively influence affective trust.

H4a is rejected as affective trust does not influence affective attitude in group 1; hence H4b is also rejected for all data as R^2 for affective attitude does not increase when affective trust is included in the construct. H8 is rejected in group 1 as control mutuality does not influence belief in group 1.

Hence there are no linkages between OPRs and RAA variables when testing hypotheses in the full dataset.

Table 6.3a: Evaluation of affective trust construct for groups 1 to 5: relationship between cognitive trust and affective trust

TCC=competency, TCD=dependency, TCI=integrity, TAF=affective trust

Message frame	Group	R^2 TAF	Standardised path coefficients			Effect size on TAF			Predictive relevance of TAF construct
			β TCC	β TCD	β TCI	f^2 TCC	f^2 TCD	f^2 TCI	Q^2
Full dataset									
All data	1	0.54	ns	**0.54****	ns	ns	**0.16**	ns	0.36
Effect of marketing messages									
Affective negative	2	0.43	ns	**0.43****	ns	ns	**0.08**	ns	0.25
Affective positive	3	0.60	ns	**0.60****	ns	ns	**0.19**	ns	0.43
Cognitive negative	4	0.52	**0.19***	**0.48****	ns	**0.03**	**0.13**	ns	0.32
Cognitive positive	5	0.60	ns	**0.70****	ns	ns	**0.29**	ns	0.38

Table 6.3b: Evaluation of cognitive attitude construct for groups 1 to 5: relationship between cognitive trust and cognitive attitude

TCC=competency, TCD=dependency, TCI=integrity, NCA=new cognitive attitude

Message frame	Group	R^2 NCA	Standardised path coefficients			Effect size on NCA			Predictive relevance of NCA construct
			β TCC	β TCD	β TCI	f^2 TCC	f^2 TCD	f^2 TCI	Q^2
Full dataset									
All data	1	0.27	ns	ns	ns	ns	ns	ns	0.46
Effect of marketing messages									
Affective negative	2	0.31	ns	ns	ns	ns	ns	ns	0.25
Affective positive	3	0.33	ns	ns	ns	ns	ns	ns	0.30
Cognitive negative	4	0.25	ns	ns	ns	ns	ns	ns	0.23
Cognitive positive	5	0.12	ns	ns	ns	ns	ns	ns	0.13

f^2 effect sizes: 0.02 small, 0.15 medium, 0.35 large, Q^2 predictive relevance must be >0 (Hair et al., 2017)

Level of statistical significance α ≤ 0.05

ns=not significant, *α ≤ 0.05, **α ≤ 0.01

Figures in green are statistically significant and meaningful

6.3.1.2 Effects of message-framing (groups 2 to 5)

To further investigate the full dataset, the effects of the four message frames in groups 2 to 5 were individually examined.

Based on Smart PLS results, H1a, H1b and H1c are accepted in groups 2 to 5 as control mutuality positively influences integrity, dependability and capability.

H2a, H2b and H2c are rejected in groups 2 to 5 as capability, dependability and integrity do not influence cognitive attitude, as shown in table 6.3b. H3a is rejected in groups 2, 3 and 5 as capability does not influence affective trust but it is accepted in group 4 (following the cognitive negative message frame) where capability does positively influence affective trust, as shown above in table 6.3a. However, H3b is accepted in all four groups 2 to 5, as dependability does positively influence affective trust. H3c is rejected in groups 2 to 5 as integrity does not influence affective trust in these groups.

H4a is rejected in the groups as affective trust does not influence affective attitude; hence H4b is also rejected for the these groups as R^2 for affective attitude does not increase when affective trust is included in the construct.

H8 is rejected in groups 2, 3 and 5 as control mutuality does not influence belief but is accepted in group 4 (cognitive negative message frame) where interestingly it does positively influence belief. There is, then, one instance where OPRs link to an RAA variable in groups 2 to 5.

6.3.1.3 Effects of message-framing in Cluster 1 (groups 6 to 9)

Based on Smart PLS results for cluster 1, H1a, H1b and H1c are accepted in groups 6 to 9 as control mutuality positively influences integrity, dependability and capability in these groups.

H2a, H2b and H2c are rejected for all four groups in cluster 1 as capability, dependability and integrity do not influence cognitive attitude, as shown in table 6.3d.

H3a is accepted in group 7 (affective positive message frame) and group 8 (cognitive negative message frame) as capability positively influences affective trust, but it is rejected in groups 6 and 9, as shown in table 6.3c below. H3b is rejected in groups 6 to 9 as dependability does not influence affective trust. H3c is accepted in group 9 (cognitive positive message) as integrity positively influences affective trust, but it is rejected in groups 6, 7 and 8.

H4a is rejected in groups 6 to 9 as affective trust does not influence affective attitude; hence H4b is also rejected for these groups as R^2 for affective attitude does not increase when affective trust is included in the construct.

H8 is rejected in all four groups as control mutuality does not influence belief in group 1. Hence there are no linkages between OPRs and RAA variables in groups 6 to 9.

Table 6.3c: Evaluation of affective trust construct for groups 6 to 9: relationship between cognitive trust and affective trust

TCC=competency, TCD=dependency, TCI=integrity, TAF=affective trust

Cluster 1: ELM High: Attitude uncertain									
Message frame	Group	R^2 TAF	Standardised path coefficients			Effect size on TAF			Predictive relevance of TAF construct
			β TCC	β TCD	β TCI	f^2 TCC	f^2 TCD	f^2 TCI	Q^2
Affective negative	6	0.48	ns	ns	ns	ns	ns	ns	0.34
Affective positive	7	0.58	**0.99****	ns	ns	**0.44**	ns	ns	0.45
Cognitive negative	8	0.49	**0.30***	ns	ns	**0.11**	ns	ns	0.22
Cognitive positive	9	0.57	ns	ns	**0.48***	ns	ns	**0.13**	0.27

Table 6.3d: Evaluation of new cognitive attitude construct for groups 6 to 9: relationship between cognitive trust and cognitive attitude

TCC=competency, TCD=dependency, TCI=integrity, NCA=new cognitive attitude

Cluster 1: ELM High: Attitude uncertain									
Message frame	Group	R^2 NCA	Standardised path coefficients			Effect size on NCA			Predictive relevance of NCA construct
			β TCC	β TCD	β TCI	f^2 TCC	f^2 TCD	f^2 TCI	Q^2
Affective negative	6	0.47	ns	ns	ns	ns	ns	ns	0.41
Affective positive	7	0.35	ns	ns	ns	ns	ns	ns	0.30
Cognitive negative	8	0.25	ns	ns	ns	ns	ns	ns	0.21
Cognitive positive	9	0.01	ns	ns	ns	ns	ns	ns	-0.03

f^2 effect sizes: 0.02 small, 0.15 medium, 0.35 large, Q^2 predictive relevance must be >0 (Hair et al., 2017)

Level of statistical significance α ≤ 0.05

ns=not significant, *α ≤ 0.05, **α ≤ 0.01

Figures in green are statistically significant and meaningful

6.3.1.4 Effects of message-framing in Cluster 2 (groups 10 to 13)

Based on Smart PLS results, H1a, H1b and H1c are accepted in groups 10 to 13 in cluster 2 as control mutuality positively influences integrity, dependability and capability in these groups.

H2a is accepted in group 13 (cognitive positive message frame) as integrity positively influences cognitive attitude but is rejected in the other three groups in cluster 2, as shown in table 6.3f. H2b and H2c are rejected in all groups in cluster 2 as neither dependability nor integrity influence cognitive attitude. H3a is accepted in group 10 (affective negative message frame) as capability has a positive influence on affective trust, but is rejected in groups 11, 12 and 13 in cluster 2, as shown in table 6.3e. H3b is accepted in groups 10 (affective negative message frame), 12 (cognitive negative message frame) and 13 (cognitive positive message frame) in cluster 2, as dependability positively influences affective trust in these groups. It is rejected in group 11 though. H3c is rejected in all four groups as integrity does not influence affective trust.

H4a is rejected in all groups in cluster 2 as affective trust does not influence affective attitude; hence H4b is also rejected for these groups as R^2 for affective attitude does not increase when affective trust is included in the construct.

H8 is rejected in all groups in cluster 2 as control mutuality does not influence belief in groups 10 to 13. Hence when considering the groups in cluster 2, there are no linkages between OPR and RAA variables.

Table 6.3e: Evaluation of affective trust construct for groups 10 to 13: relationship between cognitive trust and affective trust

TCC=competency, TCD=dependency, TCI=integrity, TAF=affective trust

Cluster 2: ELM High: Attitude certain									
Message frame	Group	R^2 TAF	Standardised path coefficients			Effect size on TAF			Predictive relevance of TAF construct
			β TCC	β TCD	β TCI	f^2 TCC	f^2 TCD	f^2 TCI	Q^2
Affective negative	10	0.65	**0.31***	**0.78****	ns	**0.09**	**0.38**	ns	0.38
Affective positive	11	0.50	ns	ns	ns	ns	ns	ns	-
Cognitive negative	12	0.65	ns	**0.81****	ns	ns	**0.42**	ns	0.41
Cognitive positive	13	0.72	ns	**0.80****	ns	ns	**0.56**	ns	0.51

Table 6.3f: Evaluation of new cognitive attitude construct for groups 10 to 13: relationship between cognitive trust and cognitive attitude

TCC=competency, TCD=dependency, TCI=integrity, NCA=new cognitive attitude

Cluster 2: ELM High: Attitude certain									
Message frame	Group	R^2 NCA	Standardised path coefficients			Effect size on NCA			Predictive relevance of NCA construct
			β TCC	β TCD	β TCI	f^2 TCC	f^2 TCD	f^2 TCI	Q^2
Affective negative	10	0.56	ns	ns	ns	ns	ns	ns	0.50
Affective positive	11	0.02	ns	ns	ns	ns	ns	ns	-
Cognitive negative	12	0.30	ns	ns	ns	ns	ns	ns	0.11
Cognitive positive	13	0.23	**0.34***	ns	ns	**0.03**	ns	ns	0.18

f^2 effect sizes: 0.02 small, 0.15 medium, 0.35 large, Q^2 predictive relevance must be >0 (Hair et al., 2017)

Level of statistical significance α ≤ 0.05

ns=not significant, *α ≤ 0.05, **α ≤ 0.01

Figures in green are statistically significant and meaningful

6.3.1.5 Effects of message-framing in Cluster 3 (groups 14 to 17)

Smart PLS results indicate that H1a, H1b and H1c are accepted for groups 14 to 17 in cluster 3 as control mutuality positively influences integrity, dependability and capability.

H2a and H2b are rejected in all four groups in cluster 3 as capability and dependability do not influence cognitive attitude, as shown in table 6.3h. However, H2c is accepted in group 16 (cognitive negative message) as integrity positively influences cognitive attitude. It is rejected in groups 14, 15 and 17.

H3a and H3c are rejected in these four groups as capability and integrity do not influence affective trust, as shown in table 6.3g. However, H3b is accepted in groups 14 to 17, as dependability does positively influence affective trust.

H4a is accepted in groups 14 (affective negative message frame) and 16 (cognitive negative message frame) as affective trust positively influences affective attitude. H4b is also accepted in groups 14 and 16. It was calculated using Smart PLS that in group 14, R^2 decreases from 0.34 to 0.27 when affective trust is omitted. Here f^2=0.11 for the effect size of the change, which is deemed to be a small effect size. For group 16, R^2 decreases from 0.24 to 0.08 when affective trust is omitted from the model. In this case, f^2=0.21 for the effect size of the change in R^2, which is deemed to be a medium effect size (Hair et al., 2017; Cohen, 1988). H4a and H4b are, however rejected, in groups 15 and 17.

H8 is accepted in group 16 (cognitive negative message frame) as control mutuality positively influences belief. It is rejected in the other three groups.

It is interesting to note that when considering the groups in cluster 3, there is one link between OPRs and RAA variables in group 14 (affective negative message frame) and three links between OPRs and RAA variables in group 16 (cognitive negative message frame) as follows:

Group 14 (affective negative message frame)

H4a: Affective trust → affective attitude

Group 16 (cognitive negative message frame)

H2c: Integrity → cognitive attitude

H4a: Affective trust → affective attitude

H8: Control mutuality → belief

Table 6.3g: Evaluation of affective trust construct for groups 14 to 17: relationship between cognitive trust and affective trust

TCC=competency, TCD=dependency, TCI=integrity, TAF=affective trust

Cluster 3: ELM Low: Attitude uncertain									
Message frame	Group	R^2 TAF	Standardised path coefficients			Effect size on TAF			Predictive relevance of TAF construct
			β TCC	β TCD	β TCI	f^2 TCC	f^2 TCD	f^2 TCI	Q^2
Affective negative	14	0.53	ns	**0.76***	ns	ns	**0.23**	ns	0.30
Affective positive	15	0.62	ns	**0.49***	ns	ns	**0.20**	ns	0.40
Cognitive negative	16	0.64	ns	**0.65***	ns	ns	**1.85**	ns	0.46
Cognitive positive	17	0.62	ns	**0.66****	ns	ns	**0.33**	ns	0.44

Table 6.3h: Evaluation of new cognitive attitude construct for groups 14 to 17: relationship between cognitive trust and cognitive attitude

TCC=competency, TCD=dependency, TCI=integrity, NCA=new cognitive attitude

Cluster 3: ELM High: Attitude uncertain									
Message frame	Group	R^2 NCA	Standardised path coefficients			Effect size on NCA			Predictive relevance of NCA construct
			β TCC	β TCD	β TCI	f^2 TCC	f^2 TCD	f^2 TCI	Q^2
Affective negative	14	0	ns	ns	ns	ns	ns	ns	-0.03
Affective positive	15	0.17	ns	ns	ns	ns	ns	ns	0.17
Cognitive negative	16	0.31	ns	ns	**0.63****	ns	ns	**0.06**	0.24
Cognitive positive	17	0.08	ns	ns	ns	ns	ns	ns	0.11

f^2 effect sizes: 0.02 small, 0.15 medium, 0.35 large, Q^2 predictive relevance must be >0 (Hair et al., 2017)

Level of statistical significance α ≤ 0.05

ns=not significant, *α ≤ 0.05, **α ≤ 0.01

Figures in green are statistically significant and meaningful

6.3.1.6 Effects of message-framing in Cluster 4 (groups 18 to 21)

Based on Smart PLS results, H1a, H1b and H1c are accepted in groups 18 to 21 as control mutuality positively influences integrity, dependability and capability.

H2a is rejected in all four groups in cluster 4, as shown in table 6.3j. In groups 18, 19 and 21, capability does not influence cognitive attitude. Although in group 20 (cognitive negative frame) capability does influence cognitive attitude, the influence is negative, not positive, as predicted in H2a. H2b and H2c are rejected in all groups in cluster 4 as neither dependability nor integrity influences cognitive attitude.

H3a and H3c are rejected in all four groups in cluster 4 as capability and integrity do not influence on affective trust, as shown in table 6.3i below. H3b is accepted in groups 19 (affective positive message frame) and 21 (cognitive positive message frame), as dependability positively influences affective trust in these two groups. H3b is rejected in groups 18 and 20.

H4a is rejected in all groups in cluster 4 as affective trust does not influence affective attitude; hence H4b is also rejected for these groups as R^2 for affective attitude does not increase when affective trust is included in the construct.

H8 is rejected in all groups in cluster 4 as control mutuality does not influence belief in groups 18 to 21. Hence when considering the groups in cluster 4, there is only one link between OPRs and RAA variables: capability negatively influences cognitive attitude in group 20 (cognitive negative).

Table 6.3i: Evaluation of affective trust construct for groups 18 to 21: relationship between cognitive trust and affective trust

TCC=competency, TCD=dependency, TCI=integrity, TAF=affective trust

Cluster 4: ELM Low: Attitude certain									
Message frame	Group	R^2 TAF	Standardised path coefficients			Effect size on TAF			Predictive relevance of TAF construct
			β TCC	β TCD	β TCI	f^2 TCC	f^2 TCD	f^2 TCI	Q^2
Affective negative	18	0.17	ns	ns	ns	ns	ns	ns	0.11
Affective positive	19	0.69	ns	**0.84****	ns	ns	**0.60**	ns	0.52
Cognitive negative	20	0.29	ns	ns	ns	ns	ns	ns	0.13
Cognitive positive	21	0.52	ns	**0.99****	ns	ns	**0.53**	ns	0.25

Table 6.3j: Evaluation of new cognitive attitude construct for groups 18 to 21: relationship between cognitive trust and cognitive attitude

TCC=competency, TCD=dependency, TCI=integrity, NCA=new cognitive attitude

Cluster 4: ELM Low: Attitude certain									
Message frame	Group	R^2 NCA	Standardised path coefficients			Effect size on NCA			Predictive relevance of NCA construct
			β TCC	β TCD	β TCI	f^2 TCC	f^2 TCD	f^2 TCI	Q^2
Affective negative	18	0.27	ns	ns	ns	ns	ns	ns	0.03
Affective positive	19	0.39	ns	ns	ns	ns	ns	ns	0.28
Cognitive negative	20	0.19	**-0.722***	ns	ns	**0.19**	ns	ns	0.17
Cognitive positive	21	0.15	ns	ns	ns	ns	ns	ns	0.03

f^2 effect sizes: 0.02 small, 0.15 medium, 0.35 large, Q^2 predictive relevance must be >0 (Hair et al., 2017)

Level of statistical significance α ≤ 0.05

ns=not significant, *α ≤ 0.05, **α ≤ 0.01

Figures in green are statistically significant and meaningful

6.3.1.7 Summary for hypotheses H1a to H4b and H8

Following the testing of hypotheses H1a to H4b and H8, it was found that the dimensions of OPRs (control mutuality, capability, dependability, integrity, affective trust) had varying effects within the 21 models depending on the cluster they are in (based on elaboration likelihood high/low and initial attitude certainty high/low) and the message frame received (affective negative, affective positive, cognitive negative, cognitive positive).

OPR dimensions linked to RAA variables in four instances: following (1) the cognitive negative message frame in group 4, (2) the affective negative message frame in cluster 3 (group 14), (3) the cognitive negative message frame in cluster 3 (group 16) and (4) the cognitive negative message frame in cluster 4 (group 20) although the latter was a negative effect. Affective trust was found to increase R^2 in affective attitude in two cases: following (1) the affective negative message frame (group 14) in cluster 3 and (2) following the cognitive negative message frame (group 16) also in cluster 3.

Table 6.4 summarises the number of times OPR hypotheses are accepted in the 21 groups. All hypotheses containing OPR variables (H1a to H4b and H8) are accepted in at least one of the 21 models, except for H2b (relationship between dependability and cognitive attitude), which is rejected in all 21 models.

To add further context to these results, the following section 5.3.2 tests hypothesis containing RAA variables.

Hypotheses		**Number of models hypothesis is accepted**					Total
			Cluster				
		Gps 1-5	1 Gps 6-9	2 Gps 10-13	3 Gps 14-17	4 Gps 18-21	
H1a	Control mutuality → capability	5	4	4	4	4	21
H1b	Control mutuality → dependability	5	4	4	4	4	21
H1c	Control mutuality → integrity	5	4	4	4	4	21
H2a	Capability → cognitive attitude	0	0	1	0	0	1
H2b	Dependability → cognitive attitude	0	0	0	0	0	0
H2c	Integrity → cognitive attitude	0	0	0	1	0	1
H3a	Capability → affective trust	1	2	1	0	0	4
H3b	Dependability → affective trust	5	0	3	4	2	14
H3c	Integrity → affective trust	0	1	0	0	0	1
H4a	Affective trust → affective attitude	0	0	0	2	0	2
H4b	R^2 affective attitude higher with affective trust	0	0	0	2	0	2
H8	Control mutuality → belief	1	0	0	1	0	2

Table 6.4: Number of groups where OPR hypotheses are accepted

6.3.2 Reasoned action approach variables

The results for the 21 groups are now analysed to test hypotheses containing RAA constructs. Due to its importance as the dependent variable, hypotheses containing new behavioural intention are tested in section 6.3.2.1. Hypotheses containing other RAA variables are tested in section 6.3.2.2.

6.3.2.1 New behavioural intention

Hypotheses containing new behavioural intention are tested on pages 263 to 275, with the groups being examined highlighted in the section headings.

The hypotheses are as follows:

H11a Subjective norm positively influences new behavioural intention

H11b Self-efficacy positively influences new behavioural intention

H11c Attitude positively influences new behavioural intention

H11d Initial behavioural intention positively influences new behavioural intention

6.3.2.1.1 Full dataset (group 1)

To test hypotheses H11a, H11b, H11c and H11d, the results for statistical significance (p) and effect size (f^2) were used to determine whether the relationships between new behavioural intention and its predictors (attitude, self-efficacy, subjective norm and initial behavioural intention) were statistically significant and meaningful. When $p>0.05$ and $f^2<0.02$, the connection in the measurement model was deleted and ns (not significant) recorded in tables 6.5a to 6.5e.

To begin with, results for the all data model were investigated. As shown in table 6.5a below, for all data in group 1, H11c and H11d were accepted as attitude and initial behavioural intention positively influenced new behavioural intention.

H11a and H11b were rejected as subjective norm and self-efficacy did not influence new behavioural intention.

Table 6.5a: Evaluating groups 1 to 5 for the new behavioural intention construct

ATT=attitude, SEF=self-efficacy, SJN=subjective norm, IBI=initial behavioural intention, NBI=new behavioural intention, extran=extraneous variables

Group		R^2 NBI	Standardised path coefficients					Effect size on NBI				Predictive relevance of NBI construct
			β ATT	β SEF	β SJN	β IBI	β extran	f^2 ATT	f^2 SEF	f^2 SJN	f^2 IBI	Q^2
Full dataset												
All data	1	0.60	**0.24****	ns	ns	**0.63****	0.63	0.11	ns	ns	0.78	0.45
Effect of marketing messages												
Affective negative	2	0.59	ns	**0.19****	ns	**0.66****	0.64	ns	**0.07**	ns	**0.80**	0.46
Affective positive	3	0.56	**0.27****	ns	ns	**0.59****	0.66	**0.13**	ns	ns	**0.62**	0.41
Cognitive negative	4	0.67	**0.26****	ns	ns	**0.66****	0.57	**0.14**	ns	ns	**0.94**	0.51
Cognitive positive	5	0.60	**0.27****	ns	ns	**0.63****	0.63	**0.16**	ns	ns	**0.85**	0.42

f^2 effect sizes: 0.02 small, 0.15 medium, 0.35 large, Q^2 predictive relevance must be >0 (Hair et al., 2017)

Level of statistical significance α ≤ 0.05

ns=not significant, *α ≤ 0.05, **α ≤ 0.01

Figures in green are statistically significant and meaningful

As new behavioural intention is the key dependant variable for the models, it is useful to introduce a path diagram at this stage to aid later results and discussion. To give an example of a final path diagram, the diagram for group 1 is included as figure 6.1 below. Here attitude and initial behavioural intention influence new behavioural intention as mentioned, and as shown in table 6.5a. In addition, belief influences new cognitive attitude and new affective attitude, and the emotions happiness and guilt influence new affective attitude. No other relationships were found to be significant and meaningful. The full set of 21 final path diagrams is included in appendix 13.

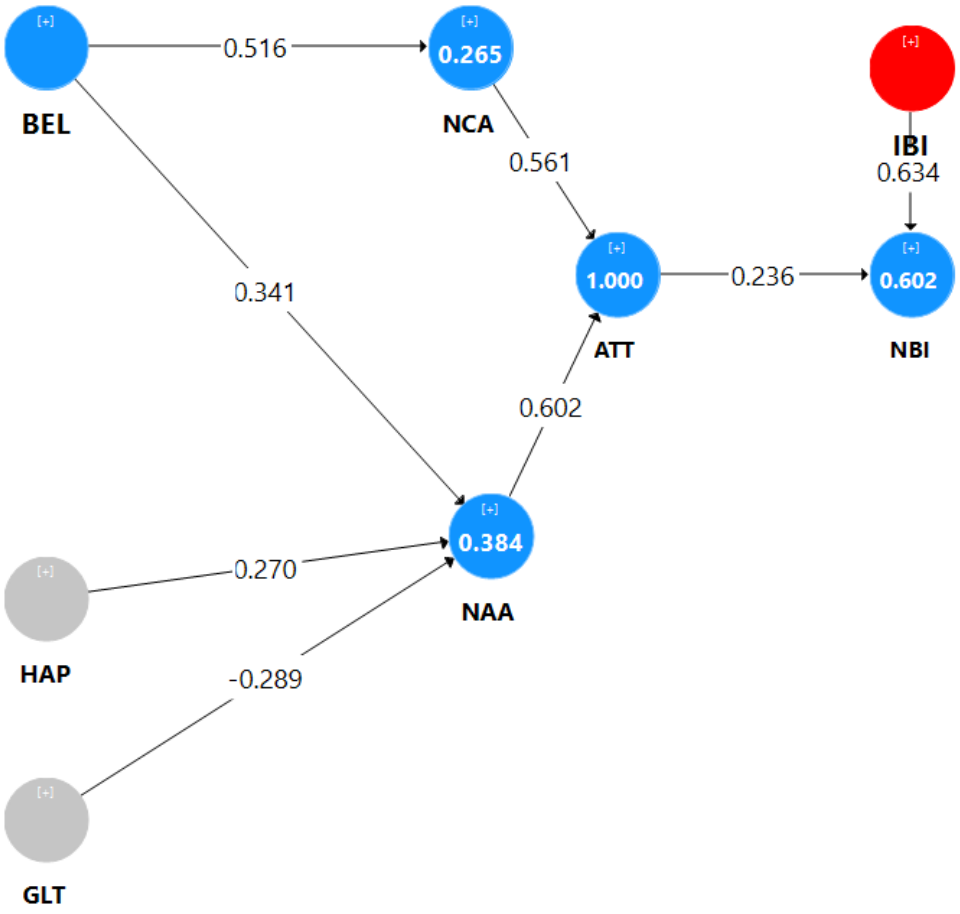


Figure 6.1: Final path diagram for all data showing significant and meaningful relationships.

BEL=belief, HAP=happiness, GLT=guilt, NCA=new cognitive attitude, NAA=new affective attitude, ATT=attitude, IBI=initial behavioural intention, NBI=new behavioural intention.

6.3.2.1.2 Effects of message-framing (groups 2 to 5)

To further investigate the full dataset, the effects of the four message frames on new behavioural intention were individually examined using table 6.5a above. Hence the models for groups 2 to 5 were analysed. For three messages, the results for the new behavioural intention construct were the same. Within groups 3, 4, and 5 (affective positive, cognitive negative, cognitive positive message frames respectively), the variables attitude and initial behavioural intention positively influenced new behavioural intention, but self-efficacy and subjective norm did not. Hence H11c and H11d were accepted in groups 3, 4 and 5, but H11a and H11b were rejected.

However, for group 2 (affective negative message frame), the results were different. Only self-efficacy and initial behavioural intention positively influenced new behavioural intention. This means that the affective negative message frame was not able to influence behavioural intention via attitude. Hence H11b and H11d were accepted for group 2 but H11a and H11c were rejected. Despite this difference, R^2 for all four marketing messages for groups 2, 3, 4 and 5 is almost the same (approximately 0.60) although slightly higher for the cognitive negative message (R^2=0.67).

A result previously reported in section 6.3.1.1 on page 250 can be seen in the path diagram for group 4 following the cognitive negative message frame (diagram 4 in appendix 13), as the OPR dimension control mutuality influences belief (β=0.27). It is interesting to note therefore that OPR has an indirect effect on new behavioural intention via belief in group 4.

6.3.2.1.3 Effects of message frames in Cluster 1 (groups 6 to 9)

To investigate the data in more depth, the effects of the four different message frames within the clusters were examined. The models for groups 6, 7, 8 and 9 in cluster 1 (ELM high, low attitude certainty) were analysed separately based on the results in table 5.5b below. Where $p>0.05$ and $f^2<0.02$, the relationships are again deleted from the structural model in this group and results recorded as ns (not significant) in table 6.5b below.

With respect to the variables attitude subjective norm and self-efficacy, there is one instance where self-efficacy positively influences new behavioural intention (group 6) hence H11a is accepted in this group and rejected in groups 7, 8 and 9, as shown in table 6.5b. There is one instance where subjective norm influences new behavioural intention (group 9), albeit negatively, hence H11b is rejected in all four groups as the hypothesis predicts positive relationships. There are three instances where attitude positively influences new behavioural intention (groups 6, 8 and 9) hence H11c is accepted in these groups and rejected in group 7. Initial behavioural intention positively influences new behavioural intention in all four groups hence H11d is accepted for all groups in cluster 1.

The final path diagrams for the groups in cluster 1 (groups 6 to 9) are included in appendix 13.

Table 6.5b: Evaluating groups 6 to 9 in cluster 1 for the new behavioural intention construct

ATT=attitude, SEF=self-efficacy, SJN=subjective norm, IBI=initial behavioural intention, NBI=new behavioural intention, extran=extraneous variables

Cluster 1: ELM High: Attitude uncertain												
Group		R^2 NBI	Standardised path coefficients					Effect size on NBI				Predictive relevance of NBI construct
			β ATT	β SEF	β SJN	β IBI	β extran	f^2 ATT	f^2 SEF	f^2 SJN	f^2 IBI	Q^2
Affective negative	6	0.59	**0.31****	**0.27***	ns	**0.41****	0.64	**0.42**	**0.12**	ns	**0.42**	0.42
Affective positive	7	0.35	ns	ns	ns	**0.61****	0.81	ns	ns	ns	**0.58**	0.21
Cognitive negative	8	0.78	**0.29****	ns	ns	**0.70****	0.47	**0.29**	ns	ns	**1.64**	0.56
Cognitive positive	9	0.78	**0.40****	ns	**-0.13***	**0.59****	0.47	**0.40**	ns	**0.06**	**1.36**	0.51

f^2 effect sizes: 0.02 small, 0.15 medium, 0.35 large, Q^2 predictive relevance must be >0 (Hair et al., 2017)

Level of statistical significance α ≤ 0.05

ns=not significant, *α ≤ 0.05, **α ≤ 0.01

Red denotes predictors ATT, SEF and SJN had no significant effect on NBI following message

Figures in green are statistically significant and meaningful

6.3.2.1.4 Effects of message frames in Cluster 2 (groups 10 to 13)

The models for groups 10, 11, 12 and 13 in cluster 2 (ELM high, high attitude certainty) were also analysed separately. Again, the results for statistical significance (p) and effect size (f^2) were used to determine whether the relationships between a variable and its predictors were statistically significant and meaningful. Relationships not statistically significant and meaningful were deleted from the path diagrams.

Results for subjective norm, self-efficacy and attitude in table 6.5c below show that these three variables have no persuasive effect on new behavioural intention in the four groups in cluster 2. Hence H11a, H11b and H11c are rejected in all four groups in cluster 2. Only the control variable - initial behavioural intention - and extraneous variables (those which affect the dependant variable which are not a predictor in the model) have an influence on new behavioural intention in these four groups. As this is a positively influence, H11d is accepted in all groups in cluster 2.

The final path diagrams for the groups in cluster 2 (groups 10 to 13) are included in appendix 13.

Table 6.5c: Evaluating groups 10 to 13 in cluster 2 for the new behavioural intention construct

ATT=attitude, SEF=self-efficacy, SJN=subjective norm, IBI=initial behavioural intention, NBI=new behavioural intention, extran=extraneous variables

Cluster 2: ELM High: Attitude certain												
Group		R^2 NBI	Standardised path coefficients					Effect size on NBI				Predictive relevance of NBI construct
			β ATT	β SEF	β SJN	β IBI	β extran	f^2 ATT	f^2 SEF	f^2 SJN	f^2 IBI	Q^2
Affective negative	10	0.90	ns	ns	ns	**0.95****	0.32	ns	ns	ns	**8.92**	0.67
Affective positive	11	0.89	ns	ns	ns	**0.95****	0.33	ns	ns	ns	**8.09**	-
Cognitive negative	12	0.53	ns	ns	ns	**0.74****	0.69	ns	ns	ns	**1.18**	0.27
Cognitive positive	13	0.57	ns	ns	ns	**0.76****	0.66	ns	ns	ns	**1.39**	0.21

f^2 effect sizes: 0.02 small, 0.15 medium, 0.35 large, Q^2 predictive relevance must be >0 (Hair et al., 2017)

Level of statistical significance α ≤ 0.05

ns=not significant, *α ≤ 0.05, **α ≤ 0.01

Red denotes predictors ATT, SEF and SJN had no significant effect on NBI following message

Figures in green are statistically significant and meaningful

6.3.2.1.5 Effects of message frames in Cluster 3 (groups 14 to 17)

The models for groups 14, 15, 16 and 17 in cluster 3 (ELM high, low attitude certainty) were also analysed separately. With respect to the variables attitude subjective norm and self-efficacy within table 6.5d below, there are two instances where self-efficacy positively influences new behavioural intention (groups 15 and 16) hence H11a is accepted in two groups and rejected in groups 14 and 17. There are three instances where subjective norm positively influences new behavioural intention (groups 14, 15 and 17) hence H11b is accepted in these groups and rejected in group 16. There are two instances where attitude positively influences new behavioural intention (groups 15 and 16) hence H11c is accepted in these groups and rejected in groups 14 and 17. It is interesting to note that subjective norm and self-efficacy play their biggest roles in cluster 3. Initial behavioural intention positively influences new behavioural intention in all four groups hence H11d is accepted in all four groups in cluster 3.

As previously reported in section 6.3.1.5 on pages 255-257, OPR also plays a unique role in cluster 3, with four constructs (control mutuality, dependability, integrity and affective trust) appearing in the path diagram for group 16 following the cognitive negative message, as seen in diagram 16 in appendix 13. This is the only group in which OPR plays a role of this significance.

The final path diagrams for the groups in cluster 3 (groups 14 to 17) are included in appendix 13.

Table 6.5d: Evaluating groups 14 to 17 in cluster 3 for the new behavioural intention construct

ATT=attitude, SEF=self-efficacy, SJN=subjective norm, IBI=initial behavioural intention, NBI=new behavioural intention, extran=extraneous variables

Cluster 3: ELM Low: Attitude uncertain												
Group		R^2 NBI	Standardised path coefficients					Effect size on NBI				Predictive relevance of NBI construct
			β ATT	β SEF	β SJN	β IBI	β extran	f^2 ATT	f^2 SEF	f^2 SJN	f^2 IBI	Q^2
Affective negative	14	0.76	ns	**-0.22***	**0.31****	**0.87****	0.49	ns	**0.15**	**0.36**	**2.62**	0.57
Affective positive	15	0.66	**0.36****	**0.19***	**0.30****	**0.33****	0.59	**0.31**	**0.10**	**0.25**	**0.27**	0.56
Cognitive negative	16	0.72	**0.26****	**0.27****	ns	**0.54****	0.53	**0.19**	**0.18**	ns	**0.84**	0.63
Cognitive positive	17	0.51	ns	ns	**0.36****	**0.62****	0.70	ns	ns	**0.27**	**0.82**	0.32

f^2 effect sizes: 0.02 small, 0.15 medium, 0.35 large, Q^2 predictive relevance must be >0 (Hair et al., 2017)

Level of statistical significance α ≤ 0.05

ns=not significant, *α ≤ 0.05, **α ≤ 0.01

Red denotes predictors ATT, SEF and SJN had no significant effect on NBI following message

Figures in green are statistically significant and meaningful

6.3.2.1.6 Effects of message frames in Cluster 4 (groups 18 to 21)

The models for groups 18, 19, 20 and 21 in cluster 4 (ELM low, high attitude certainty) were also analysed separately. Results for subjective norm, self-efficacy and attitude in table 6.5e below show that generally these three variables have no persuasive effect on new behavioural intention in the four groups in cluster 4. H11a, H11b and H11c are rejected in all groups. Subjective norm has a small, yet negative, effect on new behavioural intention (β=-0.11) in group 19 (affective positive message) but H11b is still rejected in this group as the hypothesis predicts a positive relationship. As initial behavioural intention positively influences new behavioural intention in all four groups, H11d is accepted in groups 18, 19, 20 and 21 in cluster 4.

The final path diagrams for the groups in cluster 2 (groups 18 to 21) are included in appendix 13.

Table 6.5e: Evaluating groups 18 to 21 in cluster 4 for the new behavioural intention construct

ATT=attitude, SEF=self-efficacy, SJN=subjective norm, IBI=initial behavioural intention, NBI=new behavioural intention, extran=extraneous variables

Cluster 4: ELM Low: Attitude certain												
Group		R^2 NBI	Standardised path coefficients					Effect size on NBI				Predictive relevance of NBI construct
			β ATT	β SEF	β SJN	β IBI	β extran	f^2 ATT	f^2 SEF	f^2 SJN	f^2 IBI	Q^2
Affective negative	18	0.27	ns	ns	ns	**0.53****	0.85	ns	ns	ns	0.40	0.11
Affective positive	19	0.67	ns	ns	**-0.11***	**0.81****	0.57	ns	ns	**0.04**	2.03	0.46
Cognitive negative	20	0.47	ns	ns	ns	**0.70****	0.73	ns	ns	ns	0.96	0.26
Cognitive positive	21	0.30	ns	ns	ns	**0.55***	0.84	ns	ns	ns	0.43	-

f^2 effect sizes: 0.02 small, 0.15 medium, 0.35 large, Q^2 predictive relevance must be >0 (Hair et al., 2017)

Level of statistical significance α ≤ 0.05

ns=not significant, *α ≤ 0.05, **α ≤ 0.01

Red denotes predictors ATT, SEF and SJN had no significant effect on NBI following message

Figures in green are statistically significant and meaningful

6.3.2.1.7 Summary for hypotheses H11a to H11d

To summarise, the predictors of new behavioural intention (attitude, subjective norm, self-efficacy, initial behavioural intention) had varying effects on new behavioural intention in the 21 models depending on the cluster they are in (based on elaboration likelihood high/low and initial attitude certainty high/low) and the message frame received (affective negative, affective positive, cognitive negative, cognitive positive).

Interestingly, attitude, subjective norm and self-efficacy generally had no influence on new behavioural intention in cluster 2 (groups 10 to 13) and cluster 4 (18 to 21), both groups characterised by high initial attitude certainty.

In can be seen from the total column in the rows of table 6.6 that all hypotheses involving new behavioural intention's predictors (belief, subjective norm, self-efficacy, emotions), namely H11a to H11d, are accepted in at least one of the 21 groups.

Hypotheses		**Number of models hypothesis is accepted**					Total
			Cluster				
		Gps 1-5	1 Gps 6-9	2 Gps 10-13	3 Gps 14-17	4 Gps 18-21	
H11a	Subjective norm → new behavioural intention	0	0	0	3	0	3
H11b	Self-efficacy → new behavioural intention	1	1	0	2	0	4
H11c	Attitude → new behavioural intention	3	3	0	2	0	8
H11d	Initial behavioural intention → new behavioural intention	5	4	4	4	4	21

Table 6.6: Number of groups hypotheses are accepted when investigating influence of predictors of new behavioural intention

6.3.2.2 Other RAA constructs

Hypotheses 7a to 9b were tested to investigate the influence of RAA variables emotions and belief. The hypotheses are as follows:

H7a Happiness influences behavioural intention

H7b Sadness influences behavioural intention

H7c Fear influences behavioural intention

H7d Anger influences behavioural intention

H7e Gratitude influences behavioural intention

H7f Guilt influences behavioural intention

H9a Belief positively influences cognitive attitude

H9b Belief positively influences affective attitude

The results are summarised in table 6.7 below. As the constructs for emotions and belief are of less interest within this PhD study, compared to the original contributions made by investigating the results for OPR dimensions and the dependant variable new behavioural intention, the results for emotions and belief are not reported in the same level of detail in this section. However, the full effects of emotions and belief are investigated more comprehensively for group 6 (affective negative message frame in cluster 1), 15 (affective positive message frame in cluster 3) and group 16 (cognitive negative message frame in cluster 3) when answering the research questions in section 6.4.

It is, however, interesting to note that when investigating the total effect of emotions, happiness was the emotion appearing in the most path diagrams, with H7a being accepted eight times in total, followed by guilt, with H7f being accepted seven times in total. It is also noteworthy that none of the six emotions had an effect on new behavioural intention in clusters 2 and 4, meaning that H7a to H7f were rejected in groups 10, 11, 12, 13 and 18, 19, 20, 21.

H9a was accepted on 17 occasions with belief generally positively influencing cognitive attitude, while H9b was accepted on 12 occasions with belief positively influencing affective attitude a little less frequently.

In can be seen from the total column in the rows of table 6.7 that all hypotheses involving the effect of emotions and belief were accepted in at least one of the 21 groups. Path diagrams illustrating the full effects of emotions and belief can be seen in appendix 13.

Given the varying results within clusters and groups, moderation analysis and multi-group analysis were conducted to understand the moderating influence of elaboration likelihood, attitude certainty and message framing on new behavioural intention, to test the 14 hypotheses within H5, H6 and H10.

Hypotheses		**Number of models hypothesis is accepted**					Total
			Cluster				
		Gps 1-5	1 Gps 6-9	2 Gps 10-13	3 Gps 14-17	4 Gps 18-21	
H7a	Happiness → new behavioural intention	4	2	0	2	0	8
H7b	Sadness → new behavioural intention	0	0	0	1	0	1
H7c	Fear → new behavioural intention	1	0	0	0	0	1
H7d	Anger → new behavioural intention	1	2	0	0	0	3
H7e	Gratitude → new behavioural intention	1	1	0	0	0	2
H7f	Guilt → new behavioural intention	5	1	0	1	0	7
H9a	Belief → cognitive attitude	5	3	3	3	3	17
H9b	Belief → affective attitude	5	2	2	1	2	12

Table 6.7: Number of groups hypotheses are accepted when investigating influence of belief and emotions

6.3.3 Moderation effects

This section tests hypotheses H5a to H5c (moderation of elaboration likelihood) and H10a to H10c (moderation of attitude certainty) via moderator analysis, and hypotheses $H6a_1$ to $H6d_2$ (moderation of message framing) via multi-group analysis.

6.3.3.1 Moderation effects of elaboration likelihood and attitude certainty

Moderator analysis was conducted using Smart PLS to quantify the moderating effects of the ordinal variables elaboration likelihood (high/low) and initial attitude certainty (high/low) on the new behavioural intention construct. The moderation of the relationships between the predictors (attitude, subjective norm, self-efficacy and initial behavioural intention) and new behavioural intention were thus investigated, using all data, to test hypotheses H5a to H5c, and H10a to H10c.

The hypotheses are as follows:

H5a When elaboration likelihood is high, the relationship between attitude and new behavioural intention is stronger than when it is low

H5b When elaboration likelihood is high, the strength of relationship between subjective norm and new behavioural intention is weaker than when it is low

H5c When elaboration likelihood is high, the strength of relationship between self-efficacy and new behavioural intention is weaker than when it is low

H10a When attitude certainty is high, the relationship between attitude and behavioural intention is stronger than when it is low

H10b When attitude certainty is high, the relationship between subjective norm and behavioural intention is stronger than when it is low

H10c When attitude certainty is high, the relationship between self-efficacy and behavioural intention is stronger than when it is low

The results of moderator analysis are included in table 6.8. Becker et al. (2023) recommends the reporting of unstandardised path coefficients for binary moderators, due to standard deviations (part of the formula for calculating standardised path coefficients) having no meaning for binary variables that can only take two values (1 and 0). These corrected unstandardised coefficients are included in table 6.8.

The results show that there are statistically significant moderation effects for the new behavioural intention construct ($p<=0.05$) in the following three instances:

- Attitude certainty (high/low) moderates the relationship between attitude and new behavioural intention (p=0.00). This is a negative effect. When attitude certainty is high, the relationship between attitude and new behavioural intention is weaker.
- Attitude certainty (high/low) moderates the relationships between subjective norm and new behavioural intention (p=0.00). This too is a negative effect. When attitude certainty is high, the relationship between subjective norm and new behavioural intention is weaker.
- Elaboration likelihood (high/low) moderates the relationship between subjective norm and new behavioural intention (p=0.00). This is a negative effect. When elaboration likelihood is high, the relationship between subjective norm and new behavioural intention is weaker.

	Path coefficients of moderators β (standardised)	Path coefficients of moderators β (unstandardised)
ELM x ATT NBI	ns	ns
ELM x SEF NBI	ns	ns
ELM x SJN NBI	**-0.29****	**-0.19****
ELM x IBI NBI	ns	ns
ACR x ATT NBI	**-0.29****	**-0.33****
ACR x SEF NBI	ns	ns
ACR x SJN NBI	**-0.27****	**-0.33****
ACR x IBI NBI	ns	ns

Table 6.8: Moderator analysis for new behavioural intention using all data

ELM=elaboration likelihood, ACR=initial attitude certainty, ATT=attitude, SEF=self-efficacy, SJN=subjective norm, IBI=initial behavioural intention

Level of statistical significance α ≤ 0.05
ns=not significant, *α ≤ 0.05, **α ≤ 0.01

The moderator analysis led to the following hypothesis results:

H5a is rejected as when elaboration likelihood is high, the relationship between attitude and behavioural intention is not stronger than when it is low

H5b is accepted as when elaboration likelihood is high, the strength of relationship between subjective norm and behavioural intention is weaker than when it is low

H5c is rejected as when elaboration likelihood is high, the strength of relationship between self-efficacy and behavioural intention is not weaker than when it is low

H10a is rejected as when attitude certainty is high, the relationship between attitude and behavioural intention is weaker (not stronger) than when it is low

H10b is rejected as when attitude certainty is high, the relationship between subjective norm and behavioural intention is weaker than when it is low

H10c is rejected as when attitude certainty is high, the relationship between self-efficacy and behavioural intention is not stronger than when it is low

These results, even when hypotheses are rejected, help to explain the differences between clusters in terms of how attitude, subjective norm, self-efficacy and initial behavioural intention influence new behavioural intention.

6.3.3.1.1 Effect on other constructs

Although not expected to be significant, the moderating effects of elaboration likelihood and initial attitude certainty were investigated for all data for the constructs belief, new cognitive attitude, new affective attitude and affective trust, as they are predicted by OPR dimensions. Although only three small moderation effects were found out of a possible of 56, the results do help to explain some of the differences in results between clusters and groups.

- A small negative moderation effect was found for the effect of initial attitude certainty on the relationship between control mutuality and belief (standardised β=-0.12). When initial attitude certainly is low, the relationship between control mutuality and belief is stronger.
- Initial attitude certainty negatively moderated the relationship between happiness and new affective attitude (standardised β=-0.15). When initial attitude certainly is low, the relationship between happiness and new affective attitude is stronger.
- There was a very small positive moderation effect of elaboration likelihood on the relationship between anger and affective trust (standardised β=0.05). When elaboration likelihood is high, the relationship between anger and affective trust is stronger.

As message framing is hypothesised to have a moderating effect, multigroup analysis was conducted, to understand which of the four message frames was the most effective within clusters, as explored in section 6.3.3.2.

6.3.3.2 Moderation effect of message frame

Multigroup analysis was conducted to assess the relative effectiveness of the categorical variable message frame within the 21 groups, and to test hypotheses $H6a_1$ to $H6d_2$. The hypotheses are as follows:

$H6a_1$ When a message is positive, the relationship between attitude and new behavioural intention is stronger than when it is negative

$H6a_2$ When a message is cognitive, the relationship between attitude and new behavioural intention is stronger than when it is affective

$H6b_1$ When a message is positive, the relationship between subjective norm and new behavioural intention is stronger than when it is negative

$H6b_2$ When a message is cognitive, the relationship between subjective norm and new behavioural intention is stronger than when it is affective

$H6c_1$ When a message is positive, the relationship between self-efficacy and new behavioural intention is stronger than when it is negative

$H6c_2$ When a message is cognitive, the relationship between self-efficacy and new behavioural intention is stronger than when it is affective

$H6d_1$ When a message is positive, the relationship between initial behavioural intention and new behavioural intention is stronger than when it is negative

$H6d_2$ When a message is cognitive, the relationship between initial behavioural intention and new behavioural intention is stronger than when it is affective

The results, summarised in tables 4.9a to 4.9e, are discussed in the following sections.

6.3.3.2.1 Comparing groups 2 to 5

Table 6.9a shows that there are no statistically significant differences between the path coefficients for the constructs on interest when looking at the four groups created by dividing all data by marketing message received (groups 2 to 5). This is because $p>0.10$ for all relationships between predictors and new behavioural intention. Hence it is not possible to identify one marketing message as being the most effective overall, from these results. Interestingly, when examining table 6.5a above, the path coefficients from initial behavioural intention to new behavioural intention (β=0.66, 0.59, 0.66, 0.63) and from extraneous variables (those not measured within this study in the structural model) to new behavioural intention (β=0.59, 0.66, 0.57, 0.66) are also of similar magnitude across the four message frames. These results underline the problem of not considering heterogeneity within the dataset.

It is possible to find a leading message strategy in clusters 1 and 3, when attitude certainty is low, as shown in the following two sections. Cluster 1 and 3 are examined first, as within these two clusters attitudinal variables (self-efficacy, subjective norm, attitude) have an influence on new behavioural intention, whereas in clusters 2 and 4 they do not.

Groups 2-5	Change in path coefficient (Delta beta sign)					
	ANvAP	ANvCN	ANvCP	APvCN	APvCP	CNvCP
ATT -> NBI	ns	ns	ns	ns	ns	ns
IBI -> NBI	ns	ns	ns	ns	ns	ns
SJN -> NBI	ns	ns	ns	ns	ns	ns
SEF -> NBI	ns	ns	ns	ns	ns	ns

Table 6.9a: Multigroup analysis (comparing groups 2, 3, 4, 5)

CLUSTER 1 Groups 6-9	Change in path coefficient (Δβ)		
	ANvCN	ANvCP	CNvCP
ATT -> NBI	ns	ns	ns
IBI -> NBI	**-0.29****	ns	ns
SJN -> NBI	ns	**0.18***	ns
SEF -> NBI	**0.22***	**0.23***	ns
Total	**0.51**	**0.41**	**N/A**
Strongest	**AN**	**AN**	**N/A**

Table 6.9b: Multigroup analysis (comparing groups 6, 7, 8, 9 in cluster 1)

Cluster 2 Groups 10-13	Change in path coefficient (Δβ)					
	ANvAP	ANvCN	ANvCP	APvCN	APvCP	CNvCP
IBI -> NBI	ns	**0.19***	**0.22***	ns	ns	ns
Strongest	**N/A**	**CN**	**CP**	**N/A**	**N/A**	**N/A**

Table 6.9c: Multigroup analysis (comparing groups 10, 11, 12, 13 in cluster 2)

CLUSTER 3 Groups 14-17	Change in path coefficient (Δβ)					
	ANvAP	ANvCN	ANvCP	APvCN	APvCP	CNvCP
ATT -> NBI	**-0.26***	ns	ns	ns	ns	ns
IBI -> NBI	**0.50****	**0.29****	**0.26***	**-0.21***	**-0.25***	ns
SJN -> NBI	ns	**0.27****	ns	**0.28****	ns	**-0.30****
SEF -> NBI	**-0.43****	**-0.51****	**-0.25***	ns	ns	**0.26***
Total	**-1.19**	**-0.53**	**-0.51**	**0.49**	**0.25**	**-0.04**
Strongest	**AP**	**CN**	**CP**	**AP**	**AP**	**CP**

Table 6.9d: Multigroup analysis (comparing groups 14, 15, 16, 17 in cluster 3)

CLUSTER 4 Groups 18-21	Change in path coefficient (Δβ)					
	ANvAP	ANvCN	ANvCP	APvCN	APvCP	CNvCP
IBI -> NBI	**-0.28****	**-0.17****	ns	ns	**N/A**	**N/A**
Strongest	**AN**	**AN**	**N/A**	**N/A**	**N/A**	**N/A**

Table 6.9e: Multigroup analysis (comparing groups 10, 11, 12, 13 in cluster 4)

Smart PLS bootstrapping multigroup analysis. One-tailed, α=0.10. AN=affective negative, AP=affective positive, CN=cognitive negative, CP=cognitive positive. Sign of IBI > NBI tests reversed for totals.

New p values in green statistically significant *α<=0.10, **α<=0.05, ***α<=0.01

6.3.3.3.2 Comparing groups in cluster 1 (groups 6 to 9)

The statistically significant differences between path coefficients in table 6.9b show that the leading message frame for cluster 1 is **affective negative** in group 6. This is because the affective negative message has stronger statistically significant differences for path coefficients when compared to other messages.

When the affective negative message frame is compared to the cognitive negative message frame, there are statistically significant differences for initial behavioural intention and self-efficacy. When the differences are totalled in table 6.9b (0.29+0.22), the affective negative message frame has the strongest impact hence the total is positive not negative. When compared to the cognitive positive message frame, there are statistically significant differences for subjective norm and self-efficacy. When the differences are totalled in table 6.9b (0.18+0.23), the affective negative message frame again has the strongest impact, hence the total is positive again. Interesting, the cognitive negative and cognitive positive message frames are in joint second place, as there are no statistically significant differences between path coefficients for these frames, as seen in table 6.9b.

A comparison with the affective positive message frame was not conducted as there are no statistically significant relationships between attitudinal variables (attitude, self-efficacy, subjective norm) and new behavioural intention for the affective positive message. The affective negative message frame is stronger as attitude (β=0.31) and self-efficacy (β=0.27) influence new behavioural intention and initial behavioural

intention is the weakest for this message frame (β=0.41) as shown in table 6.5b on page 268.

6.3.3.3.3 Comparing groups in cluster 3 (groups 14 to 17)

The statistically significant differences between path coefficients in table 6.9d show that **affective positive** is the most effective message frame for cluster 3, followed successively by cognitive positive, cognitive negative and affective negative. This is because the affective positive message frame has stronger statistically significant differences for path coefficients when compared to other messages.

When the leading affective positive message frame is compared to the cognitive positive message frame, there is a statistically significant difference for the path coefficient for initial behavioural intention (0.25), as shown in table 6.9d. This means that although there is no difference between the frames in terms of attitudinal variables (attitude, self-efficacy, subjective norm), there is less dependency on past behavioural intention.

When the leading affective positive message frame is compared to the cognitive negative message frame, there are statistically significant differences for the path coefficients for initial behavioural intention and subjective norm. When the differences are totalled in table 6.9d (0.21+0.28), the total is positive hence the affective positive message frame has the strongest impact (the sign of the initial behavioural intention coefficient having been reversed for the calculation).

When the leading affective positive message frame is compared to the affective negative message frame, there is a statistically significant differences for the path coefficient for initial behavioural intention, attitude and self-efficacy. When the differences are totalled in table 6.9d (-0.26-0.50-0.43), the total is negative hence the affective positive message frame has the strongest impact.

Interestingly, when path differences are totalled in table 6.9d for the cognitive negative and cognitive positive messages, the difference is very small (-30+0.26=0.04 in favour of cognitive positive) implying that the frames are effectively jointly in second place.

6.3.3.3.4 Comparing groups in clusters 2 and 4

Although self-efficacy, subjective norm and attitude generally do not have statistically significant relationships with new behavioural intention in clusters 2 and 4, multigroup analysis was conducted using the relationship between initial behavioural intention and new behavioural intention only.

In cluster 2, a cognitive message frame appears to have the strongest impact. This is because there is a statistically significant difference in path coefficients between the cognitive negative message frame and the affective negative message frame ($\Delta\beta=0.19$), and between the cognitive positive message frame and the affective negative message frame ($\Delta\beta=0.22$). Although the path coefficients are almost identical for the relationship between initial behavioural intention and new behavioural intention for the affective negative and affective positive message frames in table 6.5c above

(β=0.74, β=0.76 respectively), the differences between the cognitive frames and the affective positive message frames are marginally insignificant. Despite this, it is concluded that the **cognitive negative** and **cognitive positive** messages have a stronger impact than the affective messages, particularly as the path coefficients for extraneous variables (those variables contributing to the effectiveness of a message not included in this PhD study) are more influential for the cognitive message frames in table 6.5c (β=0.69, 0.66 versus β=0.32, 0.33 for the affective message frames).

Results in cluster 4 are less conclusive from the multigroup analysis. In table 6.9e the affective negative message frame is stronger than the affective positive frame (Δβ=0.28) and cognitive negative message frame (Δβ=0.17) and of the same impact as the cognitive positive message frame. In addition, the affective positive and cognitive negative frames are of the same impact. However, it was not possible to compare the results for the affective positive and cognitive positive frames, and the cognitive negative and cognitive positive frames, due to singular matrix problems within Smart PLS due to small sample sizes. However, it can be assumed that the **affective negative** and **cognitive positive** message frames are jointly the most effective, particularly as they have the lowest, and almost equal, path coefficients for initial behavioural intention (β=0.53 and β=0.55 versus β=0.81 and β=0.70 for the other messages) and the highest, and almost equal, path coefficient for extraneous variables (β=0.85 and 0.84, versus β=0.57 and 0.73 for the other messages) within table 6.5e. Variables not explored within this study are having a bigger effect on new behavioural intention than existing exercising habits. These results suggest that while these two messages have the largest effect on new behavioural intention, the variables creating these effects are missing from this study's structural model.

6.3.3.3.5 Effect of message frame on other constructs in cluster 3

Although not included within hypotheses, the moderating effects of message framing were investigated for four constructs within cluster 3: belief (predicted by control mutuality and the six emotions), new cognitive attitude (predicted by belief and the three elements of cognitive trust), affective trust (predicted by the three elements of cognitive trust and the six emotions) and new affective attitude (predicted by affective trust, belief and the six emotions). This was to further understand the influence of OPR in group 16, so that the path diagram for group 16 can be more authoritatively compared to that of groups 14, 15 and 17 (appendix 13).

Identically formed constructs were used in the groups for the tests. There were five instances of statistically significant differences between path coefficients for the belief construct (table 6.9f), five instances for the affective trust construct (table 6.9g), six instances for the cognitive attitude construct (table 6.6h) and 10 instances for the affective attitude construct (table 6.9i).

Three results are of great importance in explaining the presence of OPR dimensions in the path diagram for group 16 (cognitive negative message, diagram 16 in appendix 13). Firstly, table 6.9f demonstrates that the relationship between control mutuality and belief has significant differences for the cognitive negative message frame (group 16) compared to the other groups ($\Delta\beta$=0.68, 0.46, 0.48). Secondly, table 6.9h demonstrates that the relationship between integrity and cognitive attitude has significant differences for the cognitive negative message frame (group 16) compared to the other groups ($\Delta\beta$=0.75, 0.82, 0.71).

CLUSTER 3 Groups 14-17	Change in path coefficient (Δβ)					
	ANvAP	ANvCN	ANvCP	APvCN	APvCP	CNvCP
ANG -> BEL	ns	ns	ns	ns	ns	ns
CMU -> BEL	ns	**-0.68*** **	ns	**-0.46*** **	ns	**0.48** **
FER -> BEL	ns	ns	ns	ns	ns	ns
GRA -> BEL	ns	ns	ns	ns	ns	ns
GLT -> BEL	ns	ns	ns	ns	**-0.38***	ns
HAP -> BEL	ns	ns	ns	ns	**0.40***	ns
SAD -> BEL	ns	ns	ns	ns	ns	ns

Table 6.9f: Multigroup analysis for the belief construct

CLUSTER 3 Groups 14-17	Change in path coefficient (Δβ)					
	ANvAP	ANvCN	ANvCP	APvCN	APvCP	CNvCP
ANG -> TAF	ns	ns	ns	**-0.28***	ns	**0.46** **
FER -> TAF	ns	ns	ns	ns	ns	ns
GRA -> TAF	ns	ns	ns	ns	ns	ns
GLT -> TAF	ns	ns	ns	ns	ns	ns
HAP -> TAF	ns	ns	ns	ns	ns	ns
SAD -> TAF	ns	ns	ns	ns	ns	ns
TCC -> TAF	ns	ns	ns	ns	**-0.41***	ns
TCD -> - TAF	ns	ns	ns	ns	Ns	ns
TCI -> TAF	ns	ns	ns	**0.51** **	**0.41***	ns

Table 6.9g: Multigroup analysis for the affective trust construct

CLUSTER 3 Groups 14-17	Change in path coefficient (Δβ)					
	ANvAP	ANvCN	ANvCP	APvCN	APvCP	CNvCP
BEL -> NAC	**-0.42***	**-0.38***	ns	ns	ns	ns
TCC -> NAC	ns	**0.69***	ns	ns	ns	ns
TCD - > NAC	ns	ns	ns	ns	ns	ns
TCI - >NAC	ns	**-0.75***	ns	**-0.82** **	ns	**0.71***

Table 6.9h: Multigroup analysis for the cognitive attitude construct

CLUSTER 3 Groups 14-17	Change in path coefficient (Δβ)					
	ANvAP	ANvCN	ANvCP	APvCN	APvCP	CNvCP
TAF -> NAA	ns	ns	**0.60*** **	ns	**0.42** **	**0.60*** **
ANG -> NAA	ns	ns	**0.42***	ns	**0.38***	ns
FER -> NAA	ns	ns	ns	ns	ns	ns
GRA -> NAA	ns	ns	**-0.39***	ns	ns	ns
GLT -> NAA	ns	**0.34***	ns	**0.41***	ns	ns
HAP -> NAA	ns	**0.37***	ns	ns	ns	ns
SAD -> NAA	ns	**-0.65** **	ns	**-0.53***	ns	**0.66** **

Table 6.9i: Multigroup analysis for the affective attitude construct

Smart PLS bootstrapping multigroup analysis. One-tailed, α=0.10. AN=affective negative, AP=affective positive, CN=cognitive negative, CP=cognitive positive. ANG=anger, FER=fear, GRA=gratitude, GLT=guilt, HAP=happiness, SAD=sadness, BEL=belief, NAC=new cognitive attitude, NAA=new affective attitude, TAF=affective trust, CMU=control mutuality, TCC=capability, TCD=dependability, TCI=integrity

Thirdly and most importantly, table 6.9i demonstrates the differences between path coefficients for the relationship between affective trust and affective attitude. The differences are significantly different between the cognitive negative message frame (group 16) and the cognitive positive message frame (group 17) ($\Delta\beta$=0.60). This would be expected as affective trust influences affective attitude in group 16 but it does not influence affective attitude in group 17. Equally interesting, there are no differences for this relationship when compared to the affective negative message frame (group 14). This too would be expected as affective trust also influences affective attitude in group 14.

Although the relationship between affective trust and affective attitude is insignificant in group 15 (affective positive message message), there is unexpectedly no significant difference between path coefficients of groups 15 and 16 for this relationship. This is a possible outcome even between significant and insignificant results, particularly when a relationship is only marginally insignificant.

6.3.3.3.6 Summary of multigroup analysis

Reviewing the results of the multigroup analysis, if only one message frame were chosen for a physical exercise social marketing campaign, it would appear on the surface that it would not matter overall which message frame it was, as there is not a statistically significant difference between the four frames when comparing groups 2 (affective negative), 3 (affective positive), 4 (cognitive negative) and 5 (cognitive positive).

However, additional results suggest that selecting a customised message frame for each of the four clusters is likely to lead to better campaign results overall when considering the effects on new behavioural intention: affective negative frame in cluster 1 (group 6), cognitive positive/cognitive negative in cluster 2 (groups 12 and 13), affective positive in cluster 3 (group 15), affective negative/cognitive positive in cluster 4 (groups 18 and 21).

$H6a_1$ to $H6d_2$ predict that relationships will be stronger between new behavioural intention and its predictors for cognitive messages and positive messages. A summary of results appears in table 6.10 below. When counting the number of MGA tests in which the hypotheses apply, there are 0 instances where the hypotheses are accepted in groups 2 to 5, there are 0 instances for cluster 1, and there are 13 instances in cluster 3. There are 3 instances in cluster 2 and there are 0 instances in cluster 4 where the hypotheses can be provisionally accepted. Together these results point to the moderating effect of message frames within the models.

Further results attest to the moderating effect of message frames in the constructs OPR dimensions predict in cluster 3. Indeed, these results along with the results of moderation in section 6.3.3.1.1, show that the influence of OPR is largely down to the moderating effect of message framing. However, the influence of OPR is also down to the moderating role of attitude certainty, as shown in section 6.3.3.1, as this moderating effect influences the vital relationship between attitude and new behavioural intention. Once severed, vital paths, from cognitive trust to cognitive attitude and from affective trust to affective attitude, are lost.

Hypotheses		Number of MGA tests hypothesis is accepted				
			Cluster			
		Gps 2-5	1 Gps 6-9	2 Gps 10-13	3 Gps 14-17	4 Gps 18-21
$H6a_1$	When a message is positive, the relationship between attitude and new behavioural intention is stronger than when it is negative	0	0	0	1	0
$H6a_2$	When a message is cognitive, the relationship between attitude and new behavioural intention is stronger than when it is affective	0	0	0	0	0
$H6b_1$	When a message is positive, the relationship between subjective norm and new behavioural intention is stronger than when it is negative	0	0	0	2	0
$H6b_2$	When a message is cognitive, the relationship between subjective norm and new behavioural intention is stronger than when it is affective	0	0	0	0	0
$H6c_1$	When a message is positive, the relationship between self-efficacy and new behavioural intention is stronger than when it is negative	0	0	0	2	0
$H6c_2$	When a message is cognitive, the relationship between self-efficacy and new behavioural intention is stronger than when it is affective	0	0	0	3	0
$H6d_1$	When a message is positive, the relationship between initial behavioural intention and new behavioural intention is stronger than when it is negative	0	0	1	3	0
$H6d_2$	When a message is cognitive, the relationship between initial behavioural intention and new behavioural intention is stronger than when it is affective	0	0	2	2	0
TOTALS		0	0	3	13	0

Table 6.10: Results of hypothesis tests for moderation effects of message framing

6.3.4 Matching effects

This section tests hypotheses H12a to H13d to investigate the presence of matching effects. The hypotheses are as follows:

Matching effects: influence of attitude only on new behavioural intention

H12a Matching effect: In cluster 1, a cognitively framed message is the most effective message

H12b Matching effect: In cluster 2, a cognitively framed message is the most effective message

H12c Mismatching effect: In cluster 3, an affectively framed message is the most effective message (amplification hypothesis)

H12d Mismatching effect: In cluster 4, an affectively framed message is the most effective message (crystallisation hypothesis)

Influence of all predictors on new behavioural intention

H13a Matching effect: In cluster 1, a cognitively framed message is the most effective message

H13b Matching effect: In cluster 2, a cognitively framed message is the most effective message

H13c Mismatching effect: In cluster 3, an affectively framed message is the most effective message (amplification hypothesis)

H13d Mismatching effect: In cluster 4, an affectively framed message is the most message (crystallisation hypothesis)

Hypotheses H12a, H12b, H12c and H12d (most effective message – effect of attitude only on new behavioural intention) are tested using the standardised path coefficient statistics in tables 6.5b, 6.5c, 6.5d and 6.5e (pages 268-274) and the multigroup analysis in tables 6.9b and 6.9d (page 286). The results appear in table 6.11 on page 299. As it is an important reference for the predicting of the most effective message frames for each cluster, table 2.5 (containing theoretical predications for most the effective marketing strategies for the four clusters) is repeated below table 6.11.

Hypotheses H12a is rejected as it was concluded from the multigroup analysis results that, with regard to the relationship between attitude and new behavioural intention, there is no significant difference between path coefficients when comparing the four groups in cluster 1, following the issuing of the marketing message (table 6.9b). Hypothesis H12c is also rejected as there is no significant difference between path coefficients when comparing affective groups to cognitive groups in cluster 3 (table 6.9d).

H12b and H12d are rejected as attitude does not have a statistically significant relationship with new behavioural intention for any of the groups within clusters 2 and 4 (as shown in tables 6.5c and 6.5e). Hence a leading message frame cannot be found when considering the effect of attitude alone on new behavioural intention.

Hypotheses H13a, H13b, H13c and H13d (most effective message frame – effect of all predictors on new behavioural intention) are tested using the multigroup analysis results tables on page 286 and their interpretation on pages 287 to 290. The results of these hypothesis tests also appear in table 6.11.

H13a is rejected as the affective negative message frame in group 6 is found to be the most effective in cluster 1 (not a cognitive message frame).

H13b is accepted as both cognitive message frames (groups 12 and 13) are found to jointly be the most effective in cluster 2.

H13c is accepted as the affective positive message frame in group 15 is found to be the most effective in cluster 3.

H13d is accepted although it was concluded via the multigroup analysis that both the affective negative frame and cognitive positive frame were jointly the most effective within cluster 4 (groups 18 and 21).

Now that the data for stage two of the evaluation process have been analysed to test the hypotheses tested, the research questions are answered.

Hypotheses			
H12a	Cluster 1	**No matching or mismatching effect**: Cognitive message frame	Rejected
H12b	Cluster 2	**No matching or mismatching effect**: Cognitive message frame	Rejected
H12c	Cluster 3	**Mismatching effect**: Affective message frame (amplification effect)	Rejected
H12d	Cluster 4	**Mismatching effect**: Affective message frame (crystallisation effect)	Rejected

H13a	Cluster 1	**No matching or mismatching effect**. Cognitive message frame	Rejected
H13b	Cluster 2	**No matching or mismatching effect**: Cognitive message frame	**Accepted**
H13c	Cluster 3	**Mismatching effect**: Affective message frame (amplification effect)	**Accepted**
H13d	Cluster 4	**Mismatching effect**: Affective message frame (crystallisation effect)	**Accepted**

Table 6.11: Results of matching effects hypothesis tests

Most effective message frame – dominant cognitive attitude		
Elaboration	**Attitude certainty**	
	Low	High
High	***Cluster 1*** ***MATCHING EFFECT*** Cognitive message frame	***Cluster 2*** **MATCHING EFFECT** Cognitive message frame
Low	***Cluster 3*** ***MISMATCHING EFFECT*** Affective message frame	***Cluster 4*** ***MISMATCHING EFFECT*** Affective message frame

Table 2.5 repeated: Predictions for the most effective message frame within the four clusters used within this research study

6.4 Research questions

This section answers the three research questions using the results obtained from the testing of hypotheses.

6.4.1 RQ1

What are the key constructs in a structural model representing a social marketing campaign focusing on physical exercise?

To highlight the key constructs found in this experiment, the path diagrams for the leading message frames in clusters 1 and 3 are included below (repeated from appendix 13 as they are of additional interest due to being leading strategies).

- Figure 6.2a Cluster 1 – affective negative message frame (group 6)
- Figure 6.2b Cluster 3 affective positive message frame (group 15)

In addition, Figure 6.2c is included for the cognitive negative message frame for group 16 in cluster 3, as it contains OPR dimensions of interest to this PhD study (control mutuality, integrity, capability, affective trust).

With regard to key constructs, in figure 6.2a, new behavioural intention is predicted by self-efficacy, attitude and initial behavioural intention. New cognitive attitude is

predicted by belief, which itself is predicted by guilt (positive relationship) and anger (negative relationship). New affective attitude is predicted by happiness.

In figure 6.2b, new behavioural intention is predicted by self-efficacy, subjective norm, attitude and initial behavioural intention. New cognitive attitude is predicted by belief, which is itself predicted by happiness. Subjective norm and new affective attitude are both predicted by happiness. Self-efficacy is, however, predicted by sadness (negative relationship).

In figure 6.2c, new behavioural intention is predicted by self-efficacy, attitude and initial behavioural intention. New cognitive attitude is predicted by belief and integrity, an OPR dimension. New affective attitude is predicted by affective trust and guilt (negative relationship). Control mutuality predicts belief, integrity and dependability, which itself predicts affective trust.

As they only contain two variables (initial behavioural intention and new behavioural intention), it is not necessary to repeat path diagrams from appendix 13 for the leading message frames in cluster 2 (cognitive negative and cognitive positive) and cluster 4 (affective negative and cognitive positive).

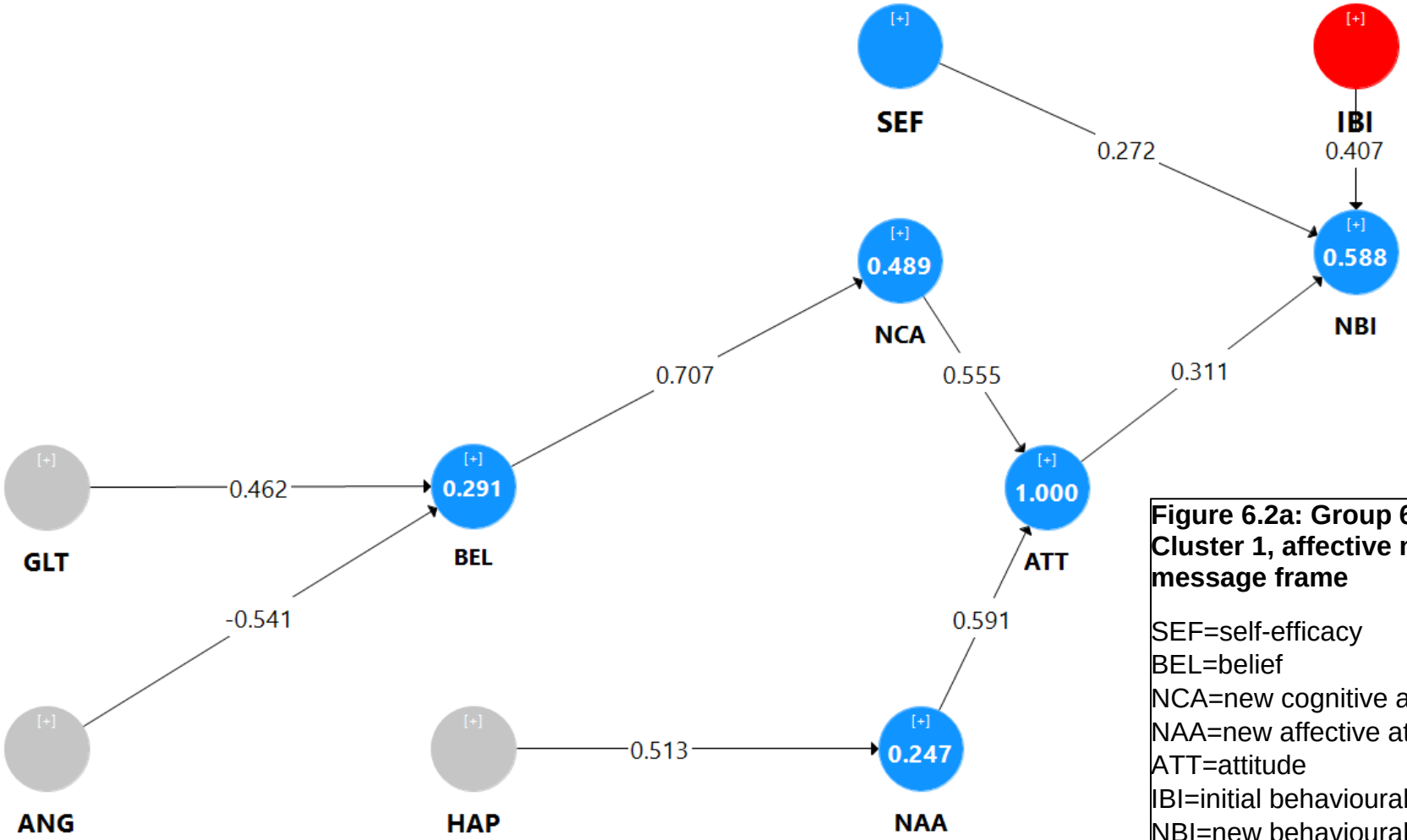


Figure 6.2a: Group 6 in Cluster 1, affective negative message frame

SEF=self-efficacy
BEL=belief
NCA=new cognitive attitude
NAA=new affective attitude
ATT=attitude
IBI=initial behavioural intention
NBI=new behavioural intention
GLT=guilt
ANG=anger
HAP=happiness

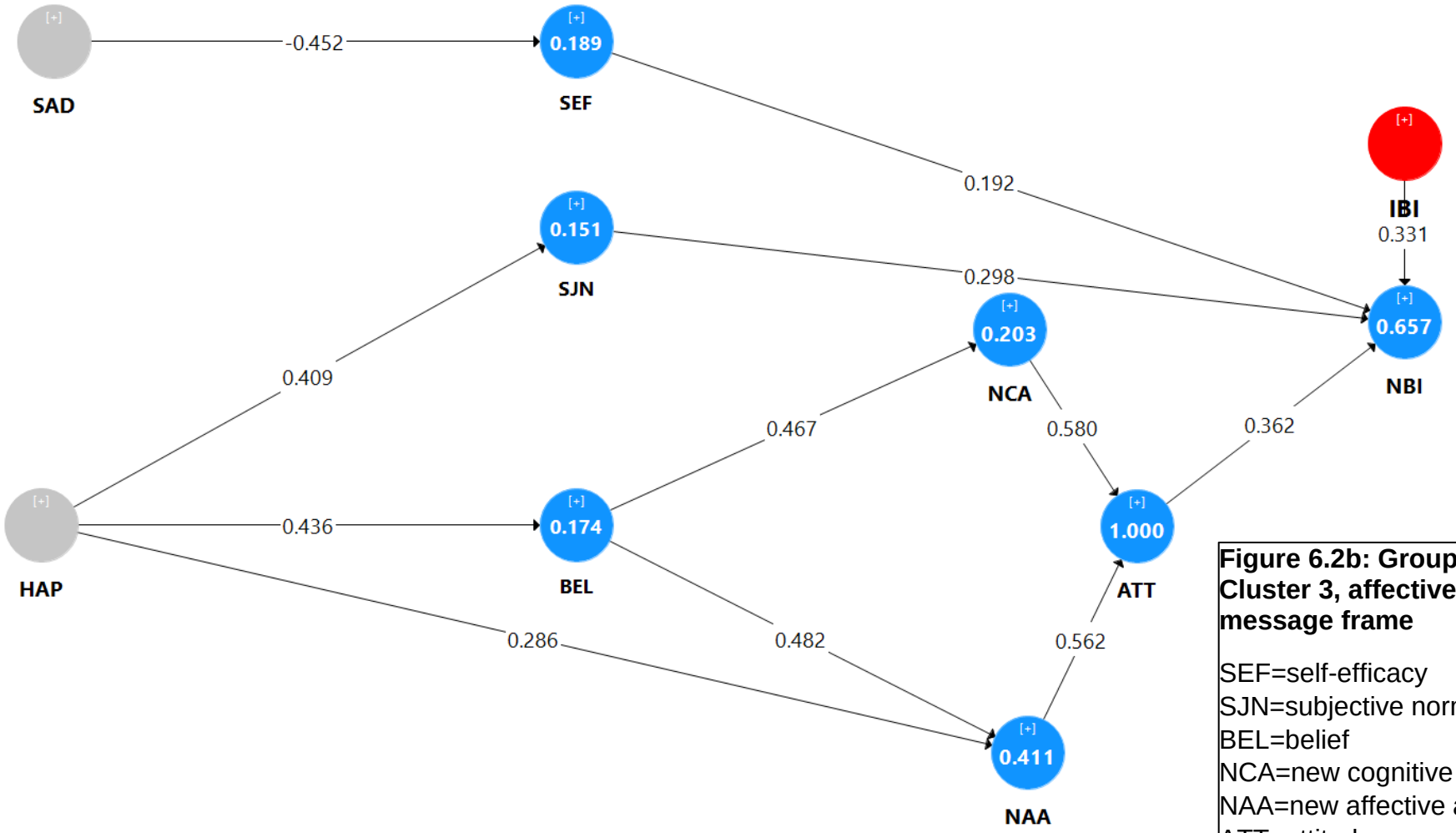


Figure 6.2b: Group 15 in Cluster 3, affective positive message frame

SEF=self-efficacy
SJN=subjective norm
BEL=belief
NCA=new cognitive attitude
NAA=new affective attitude
ATT=attitude
IBI=initial behavioural intention
NBI=new behavioural intention
SAD=sadness
HAP=happiness

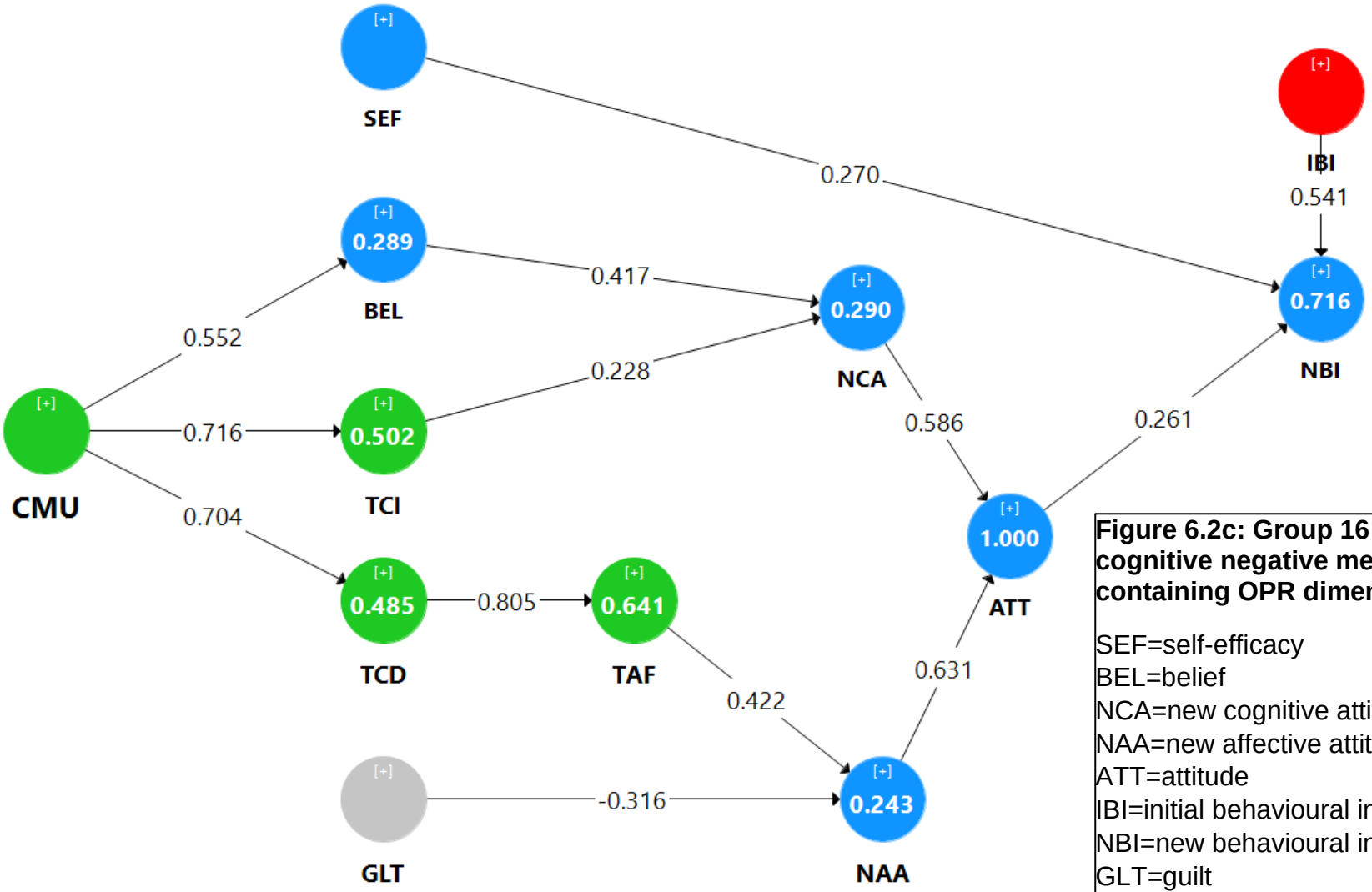


Figure 6.2c: Group 16 in Cluster 3, cognitive negative message frame, containing OPR dimensions

SEF=self-efficacy
BEL=belief
NCA=new cognitive attitude
NAA=new affective attitude
ATT=attitude
IBI=initial behavioural intention
NBI=new behavioural intention
GLT=guilt
CMU=control mutuality
TCI=integrity
TCD=dependability
TAF=affective trust

6.4.2 RQ2

Are there significant differences between groups defined by elaboration likelihood, attitude certainty and message frame, in a structural model representing a social marketing campaign focusing on physical exercise?

The 21 path diagrams in appendix 13 contain the variables which influence new behavioural intention for the 21 groups within this PhD research study. Given the uniqueness of the 21 path diagrams, and the results of the moderator analysis and multigroup analysis, it can be concluded that the variables elaboration likelihood, attitude certainty and message framing have significant moderating effects on the structural model.

Indeed, the results support how each of the 21 groups of respondents, defined by its level of elaboration and attitude certainty, and the message frame received, has a unique final path diagram with respect to statistically significant relationships between variables and path coefficients (as shown in appendix 13). Hence new behavioural intention is influenced by a unique set of variables, depending on the values of the moderators within the 21 groups.

It is particularly interesting to note that when both attitude certainty and elaboration likelihood are held constant in a cluster, there are differences between the path diagrams for the different message frames, which can be ranked according to the most effective message frame using multigroup analysis.

6.4.3 RQ3

What are the most effective pathways to improving behavioural intention within such a model?

The most effective pathways to improving behavioural intention are shown as the connections between variables in figures 6.2a for cluster 1. For example, one pathway moves from guilt to belief, new cognitive attitude, attitude and finally to new behavioural intention. Another moves from new affective attitude to attitude to new behavioural intention. Via the pathways, each variable exerts a total effect on new behavioural intention, which is calculated by multiplying the path coefficients along the pathway together. Hence the total effect for guilt along its four steps is 0.06 (=0.462x0.707x0.555x0.311). Similarly for cluster 3, the most effective pathways to improving behavioural intention are shown as the connections between variables in figures 6.2b. In this case, there are two pathways to new behavioural intention for belief and three for happiness. These pathways must be totalled to calculate the total effects for these variables. Total effects are available in results tables in Smart PLS.

The total effects of variables on new behavioural intention for the leading frame of cluster 1 (group 6, following affective negative message frame) are listed in table 6.12a, which also includes the effect of extraneous variables on new behavioural intention (those not included in the structural model). It can be seen that the total effect of belief (0.12) is slightly bigger than the net effect of emotions (0.08), comprising

happiness (0.09), guilt (0.06) and anger (-0.07). OPRs do not have an effect on new behavioural intention in cluster 1.

The total effects of variables on new behavioural intention for the leading frame of cluster 3 (group 15, following affective positive message frame) are shown in table 6.12b, which again includes the effect of extraneous variables on new behavioural intention. It can be seen that the total effect of belief (0.20) is again slightly bigger than the net effect of emotions (0.18), comprising happiness (0.27) and anger (-0.09). OPRs do not have an effect on new behavioural intention for this leading strategy.

The total effects of constructs on new behavioural intention in group 16 in cluster 3 following the cognitive negative message frame, which includes OPR dimensions, are also included in table 6.12b. Hence table 6.12b can be used to assess the relative effects of belief, emotions and OPR for the cognitive negative message in cluster 3. The total effect of control mutuality (0.10) is slightly larger than the total effect of belief (0.06) and guilt (-0.05). Indeed, the effect of OPR is of crucial importance. It can also be seen that the total effect of OPR dimensions is 0.26 (=0.10+0.06+0.03+0.07), of which affective trust accounts for 0.07 (27% of 0.26). Indeed, affective trust was previously seen to exert a medium-sized effect on affective attitude, in section 6.3.1.5 on page 255, on its path to new behavioural intention. Uniquely for this strategy, it can be concluded that OPR has a bigger effect than belief and emotions.

		Total effect on new behavioral intention (path coefficients)
		Cluster 1
		Group 6 - affective negative
Initial behavioural intention	IBI	0.41
Attitude	ATT	0.31
New cognitive attitude	NCA	0.17
New affective attitude	NAA	0.18
Self-efficacy	SEF	0.27
Belief	BEL	0.12
Happiness	HAP	0.09
Guilt	GLT	0.06
Anger	ANG	-0.07
Extraneous		0.64

Table 6.12a: Total effect on new behavioural intention for group 6 in cluster 1 (affective negative message frame)

		Total effect on new behavioral intention (path coefficients)	
		Cluster 3	
		Group 15 - affective positive	Group 15 - cognitive negative
Initial behavioural intention	IBI	0.33	0.54
Attitude	ATT	0.36	0.26
New cognitive attitude	NCA	0.21	0.15
New affective attitude	NAA	0.20	0.17
Self-efficacy	SEF	0.19	0.27
Subjective norm	SJN	0.30	
Belief	BEL	0.20	0.06
Control mutuality	CMU		0.10
Dependability	TCD		0.06
Integrity	TCI		0.03
Affective Trust	TAF		0.07
Happiness	HAP	0.27	
Sadness	SAD	-0.09	
Guilt	GLT		-0.05
Extraneous		0.59	0.53

Table 6.12b: Total effect on new behavioural intention in group 15 (affective positive message frame) and group 16 (cognitive negative message frame) in cluster 3.

Results for OPR variables are highlighted in yellow.

As there is not a significant relationship between attitude and new behavioural intention for the leading message frames in the groups in clusters 2 and 4 (as shown in diagrams 10, 11, 12, 13, 18, 19, 20, 21 in appendix 13), it is not possible to compare the relative effects of belief, affect and OPR for these clusters.

Having used the results of the hypotheses to answer the research questions, the first three research objectives set in Chapter 1 have been met:

1) **To determine the most effective pathways to changing behavioural intention using four message frames, in a model containing variables from OPR theory, the RAA and the ELM.**

2) **To calculate the relative effect of OPRs on behavioural intention compared to affect and belief.**

3) **To assess the contribution of affective trust to the influence of OPRs.**

Now that the hypotheses have been tested and the first three research questions answered, an additional section focuses on additional interesting findings from the data that will enrich later discussion. This is followed by a conclusion to the chapter.

6.5 Additional interesting results from the data

This section includes additional findings from the data that are useful when discussing the results of this PhD research study, relating to the effects of the marketing messages on attitude, attitude certainty, and intended vigorous exercise.

6.5.1 Attitude certainty

To aid later discussion, 20 paired t-tests were conducted to examine if there was a statistically significant difference between the values reported by respondents for their initial attitude certainty (measured before the message) (IAC) and new attitude certainty (NCR) (measured after the message) for groups 2 to 21. Both IAC and NCR were tested on 1 to 9 scales.

Within groups 2 to 5, there were significant effects for all message frames, as shown in table 1f in appendix 10 and as summarised below:

Group 2) Affective negative: (M_{IAC}=7.31, M_{NCR}=7.61, t(195)=3.39,p=0.00)

Group 3) Affective positive: (M_{IAC}=7.38, M_{NCR}=7.79, t(210)=4.20,p=0.00)

Group 4) Cognitive negative: (M_{IAC}=6.86, M_{NCR}=7.51, t(199)=6.01,p=0.00)

Group 5) Cognitive positive: (M_{IAC}=7.24, M_{NCR}=7.77, t(185)=5.12,p=0.00)

There were significant effects for all groups in cluster 1 (groups 6 to 9) as shown in table 1g in appendix 10 and as summarised below:

Group 6) affective negative: (M_{IAC}=5.38, M_{NCR}=6.23, t(46)=4.73,p=0.00)

Group 7) affective positive: (M_{IAC}=5.19, M_{NCR}=6.19, t(31)=3.09,p=0.00)

Group 8) cognitive negative: (M_{IAC}=5.20, M_{NCR}=6.69, t(58)=6.92,p=0.00)

Group 9) cognitive positive: (M_{IAC}=5.69, M_{NCR}=6.67, t(48)=3.92,p=0.00)

There were no significant effects for groups 10 to 13 in cluster 2 (within which respondents already had high attitude certainty) as shown in table 1h in appendix 10 and as summarised below:

Group 10) affective negative: (M_{IAC}=8.7, M_{NCR}=8.63, t(59)=0.70,p=0.48)

Group 11) affective positive: (M_{IAC}=8.76, M_{NCR}=8.81, t(53)=0.90,p=0.37)

Group 12) cognitive negative: (M_{IAC}=8.7, M_{NCR}=8.64, t(55)=0.50,p=0.62)

Group 13) cognitive positive: (M_{IAC}=8.69, M_{NCR}=8.67, t(57)=0.14,p=0.89)

There were significant effects for all message frames in cluster 3 (groups 14 to 17) as shown in table 1i in appendix 10:and as summarised below:

Group 14) affective negative: (M_{IAC}=5.66, M_{NCR}=6.42, t(37)=2.45,p=0.02)

Group 15) affective positive: (M_{IAC}=5.40, M_{NCR}=6.51, t(52)=4.08,p=0.00)

Group 16) cognitive negative: (M_{IAC}=5.13, M_{NCR}=6.21, t(46)=4.27,p=0.00)

Group 17) cognitive positive: (M_{IAC}=5.44, M_{NCR}=6.64, t(38)=4.30,p=0.00)

There were no significant effects for the three groups 18 to 20 in cluster 4 (within which respondents already had high attitude certainty). Interestingly, there was a significant effect for the fourth group 21 following the cognitive positive message frame. The results are shown in table 1j in appendix 10 and as summarised below:

Group 18) affective negative: (M_{IAC}=8.67, M_{NCR}=8.57, t(50)=0.84,p=0.40)

Group 19) affective positive: (M_{IAC}=8.78, M_{NCR}=8.67, t(71)=1.38,p=0.17)

Group 20) cognitive negative: (M_{IAC}=8.87, M_{NCR}=8.68, t(37)=1.56,p=0.13)

Group 21) cognitive positive: (M_{IAC}=8.78, M_{NCR}=8.90, t(39)=2.36,p=0.02)

6.5.1.1 Percentages moving to range of attitude certainty

To aid later discussions on customer journeys, the percentages of respondents in groups 5 to 9 in cluster 1 and in groups 14 to 17 in cluster 3 moving from the range of low attitude certainty (<8) to the range of high attitude certainty (>=8) following the message are included in table 6.13. Results for clusters 2 and 4 are not reported as these respondents were already in the range of high attitude certainty.

	Percentage of respondents moving to high attitude certainty			
	Cluster 1		Cluster 3	
Affective negative	group 6	23.40	group 14	31.58
Affective positive	group 7	29.03	group 15	33.96
Cognitive negative	group 8	36.21	group 16	40.43
Cognitive positive	group 9	30.61	group 17	43.59

Table 6.13: Percentages of respondents in groups in clusters 1 and 3 moving from the range of low attitude certainty to high attitude certainty following the message

6.5.1.2 Vigorous exercise and attitude certainty

It is interesting to compare the exercising of those with high initial attitude certainty with those of low initial attitude certainty. Generally, a majority of respondents with high initial attitude certainty (the groups in clusters 2 and 4) met and exceeded the national guidance for vigorous exercise of 75 minutes prior to the marketing message being issued, whereas in contrast a majority with low initial attitude certainty (the groups in clusters 1 and 3) failed to meet the national guidance of 75 minutes. As they will be useful for later discussion, the results for vigorous exercise are summarised for all data and by cluster in table 6.14. As there is a non-normal distribution for initial vigorous exercise (as shown in the row for variable BHV2 in appendix 9 on page 423) a Mann-Whitney U Test was conducted using SPSS. The test results confirm that there is a statistically significant difference for initial vigorous exercise when comparing respondents of high initial attitude certainty with those of low initial attitude certainty ($z=10.00$, $p=0.00$).

	M	Med
All data	85.57	60.00
Cluster 1 (high ELM, low certainty)	46.24	0.00
Cluster 2 (high ELM, high certainty)	108.80	75.00
Cluster 3 (low ELM, low certainty)	55.46	30.00
Cluster 4 (low ELM, high certainty)	122.31	100.00

Table 6.14: Pre-marketing message exposure vigorous exercise results for all data and the four clusters

6.5.2 Processing fluency

A final t-test was performed to compare levels of processing fluency for those of high initial attitude certainty (the groups in clusters 2 and 4) with those of low initial attitude certainty (the groups in clusters 1 and 3), to aid the later discussion on whether respondents were being influenced by the amplification hypothesis (when respondents have low processing fluency) or the crystallisation hypotheses (when respondents have high processing fluency). A significant effect was found ($M_{FLUENCY\text{-}IAC\text{-}HIGH}$=4.54, $M_{FLUENCY\text{-}IAC\text{-}LOW}$=4.32, t(708)=3.81,p=0.00) as shown in table 1e in appendix 10. This means that those with high initial attitude certainty processed the message more fluently than those with low initial attitude certainty.

6.6 Conclusion

This chapter presented the results of primary data gathered from 793 respondents in and around Bedfordshire, who were asked about their current levels of vigorous and moderate physical exercise, before being shown one of four marketing message frames at random. Having read the message, they were then asked again about their intended levels of physical exercise for the next seven days. The questionnaire also gathered data for variables included in OPR theory, the ELM, the RAA and cognitive-affective matching effect theory.

The primary data passed tests for convergent validity, internal consistency, reliability, discriminant validity and collinearity. Using partial least squares structural equation modelling software with all data and within 16 groups in four clusters (21 structural equation models in total), the data was analysed for the most effective message frames for all data and each cluster in terms of the effect on new behavioural intention, via multi-group analysis. The results for the most effective messages are summarised in table 6.15 below, alongside the presence of OPR dimensions and the percentage of respondents in each cluster moving from the range of low attitude certainty to high attitude certainty within the experiment. OPR variables were present in two of 21 final path diagrams:

- group 4 cognitive negative message frame
- group 16 in cluster 3 cognitive negative message frame

If social marketing campaigns used the cognitive negative message frame in cluster 3, OPRs would play a role. When comparing the total effects of belief, OPRs and emotions on new behavioural intention for this message in this cluster, OPRs play the biggest role.

With reference to table 6.15 below, although no one strategy is most effective overall, a single cognitive negative message frame would simultaneously:

- maximise the percentage going from low to high attitude certainty in cluster 1
- be a joint leading message frame strategy in 2
- utilise the persistent persuasiveness of OPR variables in cluster 3
- be the second most impactful message frame in clusters 1 and 3

These results and the accompanying analysis are now discussed and contextualised in chapter 6, which also includes this PhD research study's contribution to knowledge, thoughts on future research and implications for practitioners and policymakers promoting physical exercise in a social marketing campaign.

	Leading message frame	**Final path diagrams including OPR dimensions**	**Group with biggest % moving to certain attitude**
Full data	None	Cognitive negative	N/A
Cluster 1	Affective negative	None	Cognitive negative
Cluster 2	Cognitive negative / Cognitive positive	None	N/A
Cluster 3	Affective positive	Cognitive negative	Cognitive positive
Cluster 4	Affective negative / Cognitive positive	None	N/A

Table 6.15: Most effective message frame, presence of OPR dimensions and percentage moving to certain attitude, for all data and each cluster

7. Discussion

7.1 Introduction

For the experiment conducted for this research, respondents were presented with one of four message frames (affective negative, affective positive, cognitive negative, cognitive positive) issued randomly. As the results from each of the four clusters show in table 6.15 above, one of the message frames, or two message frames jointly in clusters 2 and 4, was considered more effective than the others having analysed all 16 groups in these clusters. OPRs played their largest role in cluster 3, following the cognitive negative frame in group 16. These results are now discussed in detail.

This chapter is structed as follows. Firstly, it is seen that analysis of the full dataset leads to the misleading conclusion that message framing does not play a persuasive role, due to the failure to consider heterogeneity of data. The heterogeneity of data is demonstrated when analysing the four clusters. Within this heterogeneity, it is then interesting to focus on the circumstances in which OPRs plays a key role. Following this analysis, separate sections briefly discuss the roles of variables subjective norm and self-efficacy within the results of this experiment. A discussion follows on potential customer journeys. Sections on research limitations and contributions to knowledge - including a new model of OPRs – precede implications for public relations practitioners and policymakers and future research recommendations. For convenience, table 6.1 is repeated below listing the groups within the four clusters and the message frame each group received. To aid understanding, the leading message frame for each set of groups is also included.

Full dataset	Group	Message received	Number of responses	Leading message frame
All data	1	One of four messages	793	No leading message
All data grouped by message frame	2	Affective negative	196	
	3	Affective positive	211	
	4	Cognitive negative	200	
	5	Cognitive positive	186	

All data divided into groups	Group	Message received	Number of responses	Leading message frame
Cluster 1: ELM High (Uncertain Attitude)	6	Affective negative	47	Affective negative
	7	Affective positive	32	
	8	Cognitive negative	59	
	9	Cognitive positive	49	
Cluster 2: ELM High (Certain Attitude)	10	Affective negative	60	Cognitive negative / Cognitive positive
	11	Affective positive	54	
	12	Cognitive negative	56	
	13	Cognitive positive	58	
Cluster 3: ELM Low (Uncertain Attitude)	14	Affective negative	38	Affective positive
	15	Affective positive	53	
	16	Cognitive negative	47	
	17	Cognitive positive	39	
Cluster 4: ELM Low (Certain Attitude)	18	Affective negative	51	Affective negative / Cognitive positive
	19	Affective positive	72	
	20	Cognitive negative	38	
	21	Cognitive positive	40	
		TOTAL	**793**	

Table 6.1 repeated: The number of responses in the 21 data groups

7.2 Analysis of full dataset

It is often an error to assume that a dataset represents a single, homogenous population. Indeed, “pooling data across observations is likely to produce misleading results” and “can lead to incorrect conclusions” (Hair et al., 2017: 290). In this experiment, heterogeneity has been considered by dividing the data into four clusters, by attitude certainty and elaboration likelihood, as recommended by Rucker and Petty (2006), before using Smart PLS to detect statistically significant differences in path parameters between the four groups in each cluster. Studying the data as a single population underlines the problem of assumed homogeneity.

The results for all data in group 1 are shown in diagram 1 (appendix 13). Here OPRs do not play a persuasive role and OPR dimensions do not appear in the path diagram. Also, emotions do not influence belief. In addition, diagram 1 shows that the total effects on new behavioural intention (NBI) of the two emotions that influence new affective attitude (NAA) have an equal but opposite effect (happiness 0.04, guilt -0.04). These results were not expected. Although all message frames have a persuasive effect on attitude and new behavioural intention (as shown by the path coefficients, statistical significance and effect size results in table 6.5a), many interesting results are lost when clustered data is not analysed.

Amongst the misleading results is the fact that none of the message frames stands out as being the most effective for groups 2 to 5, when examining the multigroup analysis in chapter 6. This is not the case when analysing clustered data. In the

clusters, one or two of the marketing messages stood out as being the most effective, as shown in the repeated table 6.1 above. It can be concluded that clustering the data is essential, to meet the aims and objectives of this PhD research study.

Looking at how emotions influence other variables is useful for developing an interesting discussion. Therefore, a section of table 2.4 is repeated below from page 162. This table below on page 321 compiles the effects of emotion on elaboration and belief within the ELM. It can be used to deduce whether primary cognition or secondary cognition is taking place as a response to a message frame. This enriches the discussion when considering customer journeys and peripheral and central processing routes, which is particularly useful for discussing when OPR does and does not have a persuasive effect within clusters.

The discussion now continues with an investigation of results within the clustered data.

	Primary cognition					Secondary cognition	
	Low constrained elaboration	Unconstrained elaboration		High constrained elaboration		Unconstrained - moderate	High elaboration
Emotion	Cue effect on belief	Influence on elaboration		Influence on belief		Influence on belief	
		Affective appraisal	**Cognitive appraisal**	**1) Argument**	**2) Bias cognition**	**Affective validation**	**Cognitive validation**
Happy	Positive	Pleasant, no effect	Certain, no effect	Backs up positive and negative cognitive arguments	Active	Pleasant – like thoughts	Confidence in appraisal
Sad	Negative	Unpleasant, increases	Uncertain, increases		Passive	Unpleasant – dislike thoughts	Doubt in appraisal
Anger	Negative	Unpleasant, increases	Certain, no effect		Active	Unpleasant – dislike thoughts	Confidence in appraisal
Surprise	Positive	Pleasant, no effect	Uncertain, increases		Active	Pleasant – like thoughts	Doubt in appraisal
Fear	Negative	Unpleasant, increases	Uncertain, increases		Active	Unpleasant – dislike thoughts	Doubt in appraisal
Guilt	Negative	Unpleasant, increases	Certain, no effect		Passive	Unpleasant – dislike thoughts	Confidence in appraisal
Gratitude	Positive	Pleasant, no effect	Certain, no effect		Active	Pleasant – like thoughts	Confidence in appraisal

Section of table 2.4 repeated: Effect of thoughts, mood and emotions on belief or cognition following marketing message within the Elaboration Likelihood Model

7.3 Analysis of clusters

In contrast to the full dataset, the four clusters - divided by elaboration likelihood (high/low) and attitude certainty (high/low) - have different leading message frames. This section substantiates this result, with reference to the path diagrams in appendix 13, by looking at OPR dimensions and matching effects. OPR dimensions are of interest as this PhD research study investigates the role of OPRs in a social marketing campaign promoting physical exercise. Matching effects results are of interest as (1) they set a benchmark establishing the leading message frame, (2) they help with identifying respondents' preferred method of processing on investigation of the path diagram for the leading message frame and (3) they influence the relative effects of OPRs, belief and emotions on new behavioural intention within this path diagram.

7.3.1 Cluster 1: high ELM, low certainty (groups 6 to 9)

For cluster 1, the **affective negative** frame was the most effective, in group 6.

7.3.1.1 OPRs

Naturally, some level of relationship has to be effective for individuals to listen and respond to any message (Grunig and Hunt, 1984). However, despite individuals registering a relationship with the healthcare providers, the OPR dimensions do not connect with RAA variables in cluster 1 following the issuing of a message hence do not influence new behavioural intention. Higher levels of cognitive attitude and affective attitude are caused by other predictors - belief and emotions - not OPR dimensions trust or control mutuality. Indeed, for the leading message frame in group

6, the relationship between belief and cognitive attitude is particularly strong (β =0.71) as shown in diagram 6 in appendix 13. It makes sense that individuals with high elaboration likelihood are not tempted to change their behaviour based on relationships, preferring the underpinning of belief. Of course, those who want to think about a topic are sometimes influenced by emotions, not cognition, as explored in the literature review of persuasion and as discussed in the next section.

7.3.1.2 Matching effects

Although Smith and Petty (1996) predict that negative message-framing is more effective for high levels of elaboration, the fact that an affective negative message frame, not a cognitive negative message frame, is the leading message frame in cluster 1 requires discussion. To understand the result, it is necessary to review the role of the emotions experienced following the affective negative message frame using the repeated table 2.4 on page 321 and diagram 6 in appendix 13 (affective negative message for cluster 1). Here guilt has a positive effect on belief (β=0.46), whereas anger has a negative effect on belief (β=-0.54). With reference to the repeated table 2.6 above, this could imply one of two results:

- **Elaboration likelihood constrained high with emotions backing up existing arguments during primary cognition**. In this scenario, the emotions are acting as information with two opposing arguments. Anger has a negative effect, while guilt has a positive effect (shown in orange in the repeated table 2.6). The opposing arguments held simultaneously could be the recognition that exercising would make one's health better (backed up by guilt) with the sense that the NHS just wants to encourage exercising to save money (backed up by anger). Individuals therefore experience some ambivalence on the topic as demonstrated by their uncertain attitudes.
- **Elaboration likelihood constrained high with emotions biasing cognition during primary cognition**. In this scenario, the argument that exercise is good for one seems more true (or less true) with the negative path coefficient of anger (β=-0.54), an active emotion, slightly outweighing the positive path coefficient of guilt (β=0.46), a passive emotion (shown in red in the repeated table 2.6). Anger is perhaps stronger, despite its negative effect, as the active emotion matches the active message of exercising more.

Given these two outcomes are the result of elaboration constrained high, it is concluded that elaboration likelihood is constrained high in cluster 1 during primary cognition. This result is interesting. This PhD study found that those with low attitude certainty in clusters 1 and 2 also have low processing fluency (in section 6.5.2 on page 314). It would seem therefore that those in cluster 1 with elaboration likelihood constrained high still have some ambivalence regarding this topic. They are still forming opinions on the more complicated aspects of physical exercise (such as

whether they need to burn more calories per week exercising). Hence these individuals are not yet indulging in secondary cognition to test their primary thoughts.

However, if elaboration is constrained high, it would be expected that H12a and H13a (which both predicted a cognitive message frame to be the most effective in cluster 1) would be accepted. Indeed, Teeny et al. (2021) predict that matching a cognitive message frame to a cognitive attitude base will lead to additional persuasiveness as a matching effect that acts as an argument or biases cognition, when elaboration likelihood is constrained high. However, the leading message frame in cluster 1 is affective in nature, not cognitive, hence H12a and H13a are rejected. This is an unexpected result. The explanation is straight-forward, though. Individuals are more responsive to an affective frame due to the simple (concrete) nature of the message presented to them in this study. Individuals with elaboration constrained high would have preferred to process more complicated (abstract) information. As the message was too simple, further processing did not occur. The result is not due to the amplification hypothesis, despite its prediction that individuals with a cognitive attitude held with uncertainty would respond more to an affective message. Individuals with high elaboration generally respond more to a cognitive message frame depending on there being new information in the message content to process, to resolve the ambivalence and opposing arguments behind their belief on the topic.

There is more to discover from the results within cluster 1. It is also interesting to consider statistically significant differences in pathways between the lead affective negative message frame (group 6) and the cognitive message frames which tie for

second place (groups 8 and 9) from the results of the multigroup analysis in table 5.9b on page 320, as matching effects literature has not previously examined multigroup analysis results. When compared to the cognitive positive message frame, the significant differences are for initial behavioural intention and self-efficacy. When compared to the cognitive negative message frame, the differences are for self-efficacy and subjective norm (although subjective norm plays no persuasive role in these two groups). There are two points of note:

- Firstly, when elaboration is constrained high and attitude certainty is low, individuals are influenced by self-efficacy, not OPRs or subjective norm. They do not need to reflect on the influence of others, whether via relationship or expectations to conform.
- Secondly, when a message is concrete (simple) in nature, matching effects do not lead to the most effective message when elaboration is constrained high and attitude certainty is low. In this experiment, the leading message frame wins due to the effect of self-efficacy in cluster 1. Individuals are spurred by their own confidence in their abilities following the affective negative message frame.

What is certain is that OPRs would not play a role regardless of abstract or concrete messaging being issued. Elaboration is constrained high and the relationship with the organisation is not persuasive within this cluster.

It is interesting to consider individual pathways to persuasion. Looking at the relative effects of emotions, belief and OPRs following the issuing of the leading affective negative message frame in cluster 1 in group 6 (diagram 6, appendix 13), the total

effect on new behavioural intention of emotions anger (-0.07), guilt (0.06) and happiness (0.09) is 0.08. The total effect of belief (0.12) illustrates that belief and emotions, overall, had similar-size positive effects, despite the message frame being negative in valence. OPRs play no role in cluster 1. The effectiveness of belief and happiness corresponds with the results of other studies examining the promotion of physical exercise (Dillard and Peck, 2001) although it would be interesting to see what the most persuasive pathways are following abstract cognitively framed messaging.

Of course, the valence of the leading affective negative message frame was important as well as its cognitive/affective nature. For the affective positive message frame, none of the variance in behavioural intention could be attributed to variables within the structural model except for initial behavioural intention (group 7: diagram 7, appendix 13), despite an affective message frame (affective negative) being the most effective in cluster 1. Indeed, Smith and Petty (1996) state that positive, not negative, message-framing is more appropriate for individuals with low elaboration likelihood, which is the case for cluster 3, to be discussed in the following section, but not cluster 1.

To summarise, individuals in cluster 1 are using emotions as information to either bias existing cognition or as additional arguments with elaboration constrained high during primary cognition. Individuals are wishing to take a central processing route. However, the affective negative message frame is the most effective, as the cognitive messages are too concrete (simple) for those with elaboration constrained high to engage in cognition. Emotions and belief play similar-sized roles. Self-efficacy influences behavioural intention. OPRs and subjective norm do not.

7.3.2 Cluster 3: low ELM, low certainty (groups 14 to 17)

Cluster 3 is discussed next, due to interesting comparisons with cluster 1. For those with an uncertain cognitive attitude and low ELM, the **affective positive** message frame was the most effective in cluster 3, in group 15.

7.3.2.1 OPRs

OPRs play their biggest role in cluster 3 in group 16, although not in the most effective message frame. While OPR dimensions do not have an effect on new behavioural intention in cluster 3 for three of the message frames in this cluster, they do in the cognitive negative frame in group 16 (diagram 16, appendix 13). Indeed, OPR variables have a larger total effect on new behavioural intention than belief (0.06) and emotions (guilt=-0.05) for this message frame (control mutuality=0.10), as shown in table 6.12b on page 308 in chapter 6. Interestingly, happiness does not play a role for the cognitive negative message frame in diagram 16, an unexpected result. It is important to discuss why OPRs play a role following this message frame in group 16, and not others.

The effect of emotions on belief is the key. An examination of the path diagrams shows that following the cognitive negative message frame in cluster 3, emotions do not affect belief, whereas OPR does affect belief (diagram 16, appendix 13). In fact, only one emotion has an influence following this message frame in group 16: guilt has a negative direct effect on new affective attitude, as mentioned (β=-0.05). This is

consistent with low levels of elaboration likelihood, when emotions do not influence primary or secondary cognition (Petty and Briñol, 2015). But as though flicking a switch, the influence of OPRs disappears when emotions influence belief, which is the case for the other message frames in cluster 3. In the case of the leading affective positive message frame in group 15 (figure 15, appendix 13), happiness has a positive effect on belief (β=0.44), implying that happiness has a cue effect following this frame, as elaboration likelihood is low within cluster 3.

OPR's role is substantial for the cognitive negative message frame in cluster 3, due to a reliance on relationship when elaboration likelihood is low. The OPR dimension control mutuality's relatively strong relationship with belief (β=0.55) can perhaps be interpreted as a cue effect due to the low levels of elaboration likelihood, with control mutuality not prompting primary cognition. Interestingly, though, OPR also influences attitude directly, as there are statistically significant relationships between integrity and cognitive attitude (β=0.23), and between affective trust and affective attitude (β=0.42).

This outcome is unique to group 16 within the clusters, though, as in other groups OPR does not influence new behavioural intention, for one of two reasons: (1) emotions influence belief, flicking the influence of OPRs to 'off' as described above, as anger and guilt do in cluster 1, or (2) there is no relationship between attitudinal variables and the dependant variable behavioural intention, severing the persuasiveness of OPRs. For example, affective trust cannot influence new behavioural intention in group 14, despite influencing affective attitude, as there is no relationship between attitude and new behavioural intention in group 14.

Despite not being the leading message frame, the cognitive negative message frame may be the best choice in cluster 3 for the promotion of exercise in some areas of the UK. Respondents demonstrate a greater reliance on their relationship with an organisation when messages fail to impact belief either via cognition or affect. In other words, when a message frame is ineffective in influencing belief, a statistically significant relationship between OPR variables and behavioural intention prevails. This result suggests that the cognitive negative message frame could prove to be extremely useful in persuading those in cluster 3 to engage in more physical exercise. While still taking a peripheral route, this message frame relies on the persuasive power of variables more permanent and persistent than the temporary effect of emotions (Petty and Cacioppo, 1986; Ledingham, Bruning and Wilson, 1999): the persuasive power of control mutuality, trust and belief. As there is no direct competitor for healthcare, it is not possible for individuals to leave the relationship for a better one.

7.3.2.2 Matching effects

Within cluster 3, the affective positive message frame leads, in group 15. Hence the mismatching effect of an affective message frame (for an uncertain cognitive attitude) backs up the amplification hypothesis. This is an expected result. Analysing the leading message is also important, as the pathways are interesting. Belief has a total effect on new behavioural intention of 0.20. Happiness influences belief positively as a cue effect within primary cognition while influencing affective attitude directly for a total effect of 0.27. Individuals appear to be taking a peripheral route. Interestingly, belief and happiness again play similar-sized roles for the leading message (as was the case with cluster 1). OPR plays no role in group 15.

The influence of valence is again important. When investigating the amplification hypothesis, Clarkson, Tormala and Rucker (2011) delivered positive message frames on a new (fictional) form of blood donation without considering how results may differ with negative message frames. In this PhD study, the negatively framed affective message (figure 14, appendix 13) sees attitude have no effect on new behavioural intention, possibly because individuals employed emotional coping to protect belief against negative cue effects (Smith and Lazarus, 1990). Subjective norm (β=0.31) and self-efficacy (β=-0.22) have almost equal opposing effects. This leaves a very strong relationship from initial behavioural intention (β=0.87) as the key influence on new behavioural intention for the affective negative message frame alongside extraneous variables. Individuals are mostly continuing with previous intentions.

There are two further points to be made in cluster 3. Firstly, it is interesting that subjective norm plays a role following three of the four message frames in cluster 3 (not following the cognitive negative message frame). Manipulating attitude certainty via the opinions of others was a part of Clarkson, Tormala and Rucker's (2011) experiment on matching effects. That is, the study made a cluster of individuals feel uncertain by saying that a majority of respondents disagreed with their thoughts on a new type of blood donation. This points to a relationship between attitude certainty and subjective norm, underlined by the influence of subjective norm in a cluster populated by uncertain individuals. This is substantiated by the fact that attitude certainty is predicted by the dimension social consensus (Tormala and Rucker, 2007). Hence it can be concluded that the uncertain individuals in cluster 3 are influenced by the opinions of others, when elaboration likelihood is low. This compares interestingly with findings in cluster 1, where subjective norm was found to be ineffective when

elaboration likelihood is constrained high, as suggested by the results of moderator analysis in section 6.3.3.1. Also, as subjective norm does not influence new behavioural intention following the cognitive negative message frame, yet OPR dimensions do, it could also be concluded that selecting this message frame is a shift from reliance on the persuasive power of others to the persuasive power of OPRs. This result could inform social marketing strategy, which has often previously found the affective positive message frame to be the best choice when framing the value of a behaviour, to shift away from cognitively based instructions.

Secondly, when considering statistically significant differences in pathways between the most effective message frame (affective positive in group 15) and what is mathematically the second most effective message frame (cognitive positive in group 17) in table 6.9d on page 286, the only significant difference is for initial behavioural intention. There are no statistically significant differences between attitudinal path coefficients (attitude, self-efficacy, subjective norm). This implies the amplification hypotheses, and hence the matching effect, is due to extraneous variables not measured in this research study, with no indirect effect on new behavioural intention via belief. Hence H12c is rejected, while H13c is accepted.

In summary of section 6.3.2, individuals in cluster 3 are taking a peripheral route. OPR and subjective norm play key roles in cluster 3, their roles switched on and off by the effect of emotions on belief. Despite the affective positive message being the leading message frame, the cognitive negative message frame may be a better choice for healthcare systems. This effect would also be more persistent than that of emotions.

7.3.3 Cluster 2: high ELM, certain attitude (groups 10 to 13)

The joint leading message frames in cluster 2 were in group 12 following the **cognitive positive** message frame and group 13 following the **cognitive negative** message frame. Again, this result is investigated by looking at OPR dimensions and matching effects.

7.3.3.1 OPRs

OPRs do not influence new behavioural intention in cluster 2, as shown in diagrams 10 to 13 in appendix 13, which only contain two variables (initial behavioural intention as a sole predictor of new behavioural intention). Of course, some level of relationship has to be in place for individuals to listen and respond to any marketing message (Grunig and Hunt, 1984). When new behavioural intention is very strongly influenced by initial behavioural intention, as it is following the positive affective message frame (group 10) and negative affective message frame (group 11) in cluster 2, the implication is that very little or no change in behavioural intention has taken place. Respondents are continuing in existing intentions. When messaging does not lead to changes in new behavioural intention via attitudinal variables, communicators would rather see a weaker influence from initial behavioural intention, and therefore a stronger influence from extraneous variables. In cluster 2, the cognitive message frames lead to stronger influences from extraneous variables, although it is not known from the results of this experiment whether OPRs influence any of these extraneous variables.

7.3.3.2 Matching effects

In cluster 2, the results show that the cognitive positive and cognitive negative message frames are equally the most effective. That is not because of an effect on cognition and/or belief though as the only influences on new behavioural intention are initial behavioural intention and extraneous variables, the latter not within the scope of this research study. It appears that the concrete (simple) cognitive information is serving as a nudge effect (Handel, 2015) for individuals to do the exercising they had already intended to do, perhaps as a form of triggering event (Jackson, 1990; Moss and DeSanto, 2012). Those in cluster 2 are generally already doing more than 75 minutes of vigorous exercise weekly. It is therefore cognitive framing that increases the size of the nudge effect or trigger to keep hitting exercising targets. This is interesting as it shows again that matching effects are extraneous variables that impact new behavioural intention directly.

H12b was rejected as attitude does not influence new behavioural intention. However, H13b was accepted due to the effect of extraneous variables. It is not down to the amplification or crystallisation hypotheses. If present, the crystallisation hypothesis would have predicted an affective message to be the most effective, for individuals with cognitive attitudes held with certainty and high processing fluency.

As emotions do not play a persuasive role in cluster 2 (diagrams 10 to 13 in appendix 13), it is not possible to deduce whether individuals in cluster 2 are engaging in primary or secondary cognition using table 2.6. However, it can be assumed that they are

engaging in secondary cognition, as processing fluency is high within this cluster, indicating familiarity with the topic of physical exercise. Hence cognitive nudge effects are nudging individuals into remembering their beliefs before keeping their exercising intentions.

In summary of section 6.3.3, OPRs do not play a role in persuasion in the groups in cluster 2, nor do belief or emotions. The amplification and crystallisation hypotheses are not active as individuals with high elaboration likelihood appear to be more interested in cognitive nudge effects to continue meeting the Government's exercising recommendations. The cognitive matching effect appears to be from extraneous variables, as with cluster 3.

7.3.4 ELM low, certain attitude: Cluster 4

There are two lead message frames in cluster 4 - **affective negative** and **cognitive positive** - the results for which are explored with reference to OPR dimensions and matching effects.

7.3.4.1 OPRs

OPRs do not influence new levels of attitudinal variables in this experiment in groups 18 to 21 in cluster 4, as shown in diagrams 18 to 21 in appendix 13, which only contain two variables (initial behavioural intention as a sole predictor of new behavioural intention) except for the fact that some level of relationship has to be in place for individuals to listen and respond to any marketing message (Grunig and Hunt, 1984). As with cluster 2, it is not known whether OPRs influence any of the extraneous variables that influence new behavioural intention. However, the effect of OPR results may be obscured by the assumption of homogeneity within cluster 4, as explained in the following section.

7.3.4.2 Matching effects

There are two lead message frames in cluster 4: affective negative in group 18 and cognitive positive in group 21. The message frames will be examined separately.

7.3.4.2.1 Affective negative message frame

The effect of the affective negative message frame conforms with Ryfell and Wirth's (2016) conclusion that the effects of the crystallisation hypothesis will apply, as respondents have low elaboration likelihood having processed all of the information they are interested in. Hence, as they have reached processing sufficiency and are processing information fluently, they are more interested in scrutinising a mismatched affectively framed message. Therefore, H13d was accepted. It is theoretically possible these respondents were previously in cluster 2 with higher elaboration, their elaboration likelihood subsiding as processing sufficiency approached. Those arriving in cluster 4 from cluster 2 in the second sub-group are possibly engaging in the cognitive validation of secondary cognition. They are disliking their thoughts concerning not exercising due to the negative affective message frame and are therefore nudged into keeping to their exercising intentions.

H12d was rejected though as the only variables influencing new behavioural intention following an affective negative frame are initial behavioural intention and extraneous variables. This implies that the mismatching effect is again caused by extraneous variables nudging individuals into physical exercise via negative affective messaging.

The valence of the frame is important though. In Ryfell and Wirth's (2016) study focusing on a new sun cream, individuals were issued with negative frames. Participants were divided into two groups, one issued with a negative cognitive frame the other issued with a negative affective frame. Positive frames were not issued to

assess the effect of positive valence. This PhD research study expanded on this area of analysis, creating a benchmark through the additional consideration of the effects of positive messaging. There are two interesting results. A positive affective frame was found to be the least effective message in cluster 4 (group 19). Indeed, for a positive affective frame, new behavioural intention was very strongly influenced by initial behavioural intention (β=0.80). It appears that a negative emotion such as guilt was more successful at creating nudges, the category of persuasive effects explored by Handel (2015), on new behavioural intention.

7.3.4.2.2 Cognitive positive message

As mentioned, the cognitive positive message frame in group 21 was also equally effective in cluster 4. This message, matching respondents' cognitive attitudes, does not agree with Ryfell and Wirth's (2016) conclusion concerning the crystallisation hypothesis, which predicts an affective message frame will be the most effective. This implies that the cognitive positive message frame was equally effective at creating a nudge or similar effect on new behavioural intention. Whether or not these are the same nudge effects as prompted by the affective negative frame is unclear.

For two message frames of opposite nature (affective negative, cognitive positive) to have an equal effect, it appears that cluster 4 contains a mixture of individuals in two sub-groups. Some of the individuals have perhaps previously been in cluster 3 with an uncertain cognitive attitude and low elaboration likelihood. They now have a more certain cognitive attitude having moved into cluster 4 on a customer journey.

Therefore, they are possibly influenced by the nudge effects of matching positive cognitive message-framing, due to the amplification hypothesis, with the nudge effects driven by extraneous variables. However, in this second sub-group it is possible that the effect of some variables, including OPR variables and emotions, are obscured by the effects of presumed homogeneity of data. This is particularly fascinating as this PhD study discovered that individuals subjected to a cognitive negative frame in cluster 3 had persuasiveness and attitude certainty influenced by OPR and self-efficacy.

As emotions do not play a role in cluster 4, it is not possible to deduce the type of primary or secondary cognition individuals are engaging in, using table 2.4 on page 321. Despite this, those arriving in cluster 4 from cluster 3 in the second sub-group are likely to be taking a peripheral route, due to the influence of simple positive messaging on individuals with low elaboration likelihood. The possibility of individuals with a certain cognitive attitude responding to the effects of the amplification hypotheses were previously discounted in this PhD study (see page 175). However, this outcome seems to be likely for some respondents in cluster 4 after all, a conclusion substantiated by the fact that attitude certainty increased for those receiving the cognitive positive message in cluster 4 (as mentioned in section 6.5.1 on page 310 and recorded in the t-test results in table 1k in appendix 10). This implies that those receiving the cognitive positive message frame also increased the amount of vigorous exercise they were doing, as there is a link between attitude certainty and vigorous exercise (as demonstrated in section 6.5.1.2 on page 313). Attitude certainty did not increase following the other three messages in cluster 4.

The discussion of cluster 4 has touched upon customer journey possibilities, which are addressed in more detail in section 7.6.

In summary of section 7.3.4, OPRs do not play a role in cluster 4 in this experiment, nor do belief or emotions, although the role of some variables may be obscured due to issues of presumed homogeneity. As there are two lead message frames for two sub-groups, those responding to the matching cognitive positive message frame are affected by the amplification hypothesis as they take a peripheral route, whereas those responding to the mismatching affective negative message frame are affected by the crystallisation hypothesis having lower elaboration than when in cluster 2, perhaps having previously taken a central route to cluster 2. Both matching/mismatching effects appear to be driven by extraneous variables, as was the case in clusters 2 and 3.

7.4 Subjective norm

As discussed above in section 7.3.2.2 on page 331, the RAA variable subjective norm plays its most persuasive role for those with low elaboration likelihood and low attitude certainty in cluster 3 in groups 14, 15 and 17, where it has interesting comparisons with OPR dimensions (path diagrams for cluster 3 appear as diagrams 14, 15, 16, 17 in appendix 13). In other clusters, it plays a small negative role, or no role.

Following a persuasive appeal, it does not play a persuasive role when all data is analysed, nor does it play a persuasive role in cluster 2. In cluster 1, it plays only a small persuasive role for one message frame: a negative effect (β=-0.13, diagram 9 in appendix 13) on new behavioural intention for following the cognitive positive message frame in group 9, perhaps because those with high elaboration likelihood are more interested in authoritative information on the topic, and their own self-efficacy, than the opinions of others. The negative effect may be because the general public are less interested in exercise than those in cluster 1, hence the influence of others is discouraging.

In cluster 4, subjective norm plays a small negative role for one message frame: a negative effect on behavioural intention for the affective positive message frame in group 19 (β=-0.11 in diagram 19 in appendix 13). Individuals are doing more exercise than average hence public opinion plays a discouraging role.

However, in cluster 3, subjective norm has a statistically significant medium-sized effect for all message frames, except cognitive negative. Indeed, for the most persuasive message frame, affective positive, it has a similar-sized total effect (0.30) to belief (0.20), happiness (0.27) and initial behavioural intention (0.33) (diagram 15 in appendix 13). There seems to be a greater reliance on the expectations of others when attitudes are uncertain and when further thinking on a topic is unlikely to take place when elaboration likelihood is low. Interestingly, though, as mentioned it does not play a role for the cognitive negative frame in group 16, when individuals place greater reliance on their relationship with the organisation, with control mutuality having a slightly smaller but statistically significant total effect on new behavioural intention (0.10) (diagram 16 in appendix 13).

Looking at the path diagrams for cluster 3 (diagrams 14, 15, 16, 17, appendix 13), it is possible that the influential effects of subjective norm and OPRs are switched on or off depending on the same two factors, as mentioned above. To summarise again:

- If emotions have a cue effect on belief, or if there is no relationship between attitude and behavioural intention, subjective norm plays a persuasive role.
- If emotions do not have a cue effect on belief and there is a statistically significant relationship between attitude and behavioural intention, OPRs instead play a persuasive role.

While the moderating effects of attitude certainty, elaboration likelihood and message frame are the key contributors to such observations, the mechanisms behind these results are unknown.

7.5 Self-efficacy

The RAA variable self-efficacy also plays its most persuasive role for those with low elaboration likelihood and low attitude certainty in cluster 3. This time it could though be seen as a valuable persuasive stablemate of OPRs.

In cluster 1, it plays a medium-sized role (β=0.27) for those receiving the affective negative message frame in group 6 (diagram 6, appendix 13), the most effective message frame in this cluster. In clusters 2 and 4, it plays no role at all. In cluster 3, it has a medium-sized positive effect for the affective positive message frame in group 15 (β=0.19) (diagram 15, appendix 13), the leading message frame for this cluster, and for the cognitive negative message frame in group 16 (β=0.27) (diagram 16, appendix 13), but, surprisingly, a medium-sized negative effect for the affective negative message frame in group 14 (β=-0.22) (diagram 14, appendix 13). Feelings of higher levels of capacity to do physical exercise led to less of an intention to do it following this message, demonstrating how an affective negative message frame can discourage those with low elaboration. Self-efficacy does not cause the amplification effect in cluster 3 though, which, according to the multigroup analysis, is due to extraneous variables.

In cluster 3 there is once again a greater reliance on a variable that endures over time, in this case self-efficacy, when attitudes are uncertain and when more thinking on a topic is unlikely due to low elaboration likelihood. It is interesting that self-efficacy plays a persuasive role alongside OPRs for the cognitive negative message frame in cluster

3, as this offers organisations another route to long-term persuasiveness: by focusing on the building of self-efficacy, perhaps alongside the building of OPRs, instead of focusing on the promotion of physical exercise. In this case, the circumstances which lead to OPRs having an effect on new behavioural intention do not prevent self-efficacy from having an effect, as they do for subjective norm. The findings of sections 7.1 to 7.5 are now summarised in a table 7.1.

Main findings within the four clusters		
Elaboration	**Attitude certainty**	
	Low	High
High	***Cluster 1*** Mismatching affective negative message frame most effective due to simple message	***Cluster 2*** Matching cognitive message frames most effective as nudge effect
Low	***Cluster 3*** Mismatching affective positive message frame most effective due to amplification hypothesis Relationship with organisation (OPR) plays biggest role for cognitive negative frame Cognitive negative frame may be most effective message due to more persistent effects of OPR and self-efficacy Influence of others (subjective norm) plays role for three message frames but not cognitive negative Self-efficacy plays role for three message frames but not cognitive positive Cue effects of emotions on belief influence roles of OPR and subjective norm	***Cluster 4*** Matching cognitive positive message frame due to amplification hypothesis most effective for one group as nudge effect Mismatching affective negative message frame due to crystallisation hypothesis most effective for second group as nudge effect

Table 7.1: Summary of main findings in the four clusters

7.6 Customer journeys

The results of this PhD research study suggest that respondents are taking, or could be persuaded to take, a horizonal customer journey from one cluster to another, from cluster 1 to cluster 2, or from cluster 3 to cluster 4. These journeys move individuals from low to high attitude certainty. Clusters 2 and 4, at the ends of the journey, are also associated with higher substantially levels of vigorous exercise. Such journeys have been described in persuasion literature as a central route and a peripheral route, based on levels of elaboration likelihood (Petty and Cacioppo, 1986).

To change behaviours and increase attitude certainty, Rucker and Petty (2006) devise a six-step model to guide PSA campaign effectiveness. Step 1 encourages communicators to assess individuals' levels of elaboration, while step 2 encourages communicators to match messages to the audience's level of elaboration likelihood. Step 3 asks communicators to make a choice between immediate and enduring attitude change, before step 4 assesses the congruency of the decisions made in the first three steps. Step 5 encourages the exploration of message effectiveness at different levels of elaboration, before step 6 assesses final effectiveness, including the effect on attitude certainty. These steps imply the presence of at least two customer journeys via the increasing of attitude certainty: (1) high elaboration/low certainty to high elaboration/high certainty and (2) low elaboration/low certainty to low elaboration/high certainty. These two journeys are explored as a central route and peripheral route in the following section.

7.6.1 Central route and peripheral route

Within the results of this PhD research study, journey (1) described above is from cluster 1 to cluster 2 (high elaboration/low certainty to high elaboration/high certainty). This direction is logical as the initial level of mean vigorous exercise (M=46.24) for cluster 1 is lower than the initial level of mean vigorous exercise (M=108.80) for cluster 2. Following the message in cluster 1 more than 20% of respondents increase attitude certainty to the level of cluster 2 (attitude certainty >7 on a scale of 1 to 9) according to table 6.13 implying a horizontal customer journey from cluster 1 to cluster 2. OPRs do not play a role in this customer journey, as individuals have elaboration constrained high and prefer to be influenced by cognitively framed messaging, not OPRs. However, within this PhD study, the affective negative message frame in group 6 is the most persuasive in cluster 1, due to the concrete (simple) content of a PSA.

Journey (2) described above is from cluster 3 to cluster 4 (low elaboration/low certainty to low elaboration/high certainty). This direction is logical as the initial level of mean vigorous exercise for cluster 3 (M=55.46) is lower than the initial level of mean vigorous exercise for cluster 4 (M=122.31). In addition, more than 30% of respondents in cluster 3 experience an increase in attitude certainty that reaches the level of cluster 4 (>7 on a scale of 1 to 9), following the message, implying a movement from cluster 3 to cluster 4. OPR does play a role in this customer journey though, following the cognitive negative message frame in group 16 in cluster 3. As the cognitive negative message frame leads to a larger percentage of individuals increasing in attitude certainty to the level associated with cluster 4 (40.43% for cognitive negative, versus 31.58% for the leading affective positive message), it is likely that the customer journey will be more

permanent for a greater number of individuals following this message. Less of them will slip back into cluster 3. This consideration agrees with Rucker and Petty's (2006) suggestion of selecting a message that is congruent with the objective of achieving enduring change.

In summary of section 7.6.1, individuals taking a customer journey from cluster 1 to 2 are taking a central route (with high elaboration likelihood), and individuals taking a customer journey from cluster 3 to 4 are taking a peripheral route (with low elaboration likelihood). The results correspond with Rucker and Petty's (2006) six-step approach to strategic marketing communications where it is advised that communicators consider initial levels of attitude certainty and elaboration likelihood when devising communications.

7.6.2 Longer customer journeys

Customer journeys involving three (1→2→4) or even four clusters (3→1→2→4), not described in Rucker and Petty (2006), may theoretically be possible via a string of campaigns with tailored messaging, but their worth can be questioned given the role played by OPRs in cluster 3 in moving respondents to cluster 4 directly.

It is possible that some individuals could begin in cluster 3 with low elaboration likelihood and low initial attitude certainty and, following messaging, increase elaboration likelihood, due to the interesting use of compelling storyplots or fear messaging (Kent, 2015; Petty and Cacioppo, 1986; Petty and Briñol, 2015). This

higher elaboration likelihood takes them into cluster 1. A subsequent tailored message for those in cluster 1 then increases the individuals' behavioural intention and attitude certainty, taking them into cluster 2. If their interest in further information then dwindles as processing sufficiency approaches, their elaboration likelihood could drop again, taking them into cluster 4. However, if their interest in further information does not dwindle due to elaboration likelihood remaining high, they will stay in cluster 2.

This four-cluster journey (3→1→2→4) could theoretically be started at any point on the journey depending on an individual's circumstances. Its value lies in the fact that those with a higher level of elaboration likelihood are likely to have more persistent changes in behaviour due to the longer-lasting persuasiveness of cognitive arguments (Petty and Cacioppo, 1986). There could be a role for OPRs as trust has a direct relationship with information attending (reading information discovered passively) as previously mentioned in chapter 1 (Ni et al., 2019), although OPRs do not play a role in the journey from cluster 1 to cluster 2, or from cluster 2 to cluster 4, as discussed.

This PhD research study does not find evidence of this clockwise movement between all four clusters (3→1→2→4) for PSAs though. Elaboration is measured after, not before, individuals read a message, so if elaboration remains low following the message, it can be concluded that the simple messaging is not captivating individuals in the way an absorbing news story would, or inducing elaboration as primary cognition via, for example, fear messaging, to prompt a move from cluster 3 to cluster 1. There is no evidence of an emotion such as fear stimulating further elaboration in cluster 3 and hence improving belief as cognitive or affective appraisal during primary cognition (path diagrams 14 to 17 in appendix 13). Although happiness influences belief

following the leading affective positive message frame in cluster 3, this is likely to be a simple cue effect that does not lead to more cognition (as shown in table 2.4). Despite this logic, as it was concluded above from an analysis of emotions that respondents in cluster 1 had elaboration likelihood constrained high, it is unlikely that respondents had previously been in cluster 3 with low elaboration likelihood.

Regarding individuals moving from cluster 2 to cluster 4, it is possible that some of those in cluster 4 had previously been in cluster 2. A series of more detailed (abstract) messages that individuals actively sought out could have led to processing sufficiency being met, at which point, as discussed, elaboration likelihood decreases, moving individuals to cluster 4, where the crystallisation hypothesis becomes effective. This explains why a mismatched affective negative message frame in group 18 was one of the leading message frames in cluster 4. Of course, if elaboration is constrained high for some of those in cluster 2, processing sufficiency may not be met at all for those individuals. As previously noted, individuals in cluster 2 seem to be most influenced by cognitive message framing that provides a nudge effect on behavioural intention, although it is not known from this experiment what variables led to this nudge effect. Whether some individuals in cluster 2 have elaboration constrained high, while some do not, is unknown. It may be the case that elaboration is constrained high for all individuals, making a journey from cluster 2 to cluster 4 unlikely.

The worth of a clockwise journey with four clusters (3→2→1→4) could be questioned given the more direct peripheral route from cluster 3 to cluster 4, especially given the role of OPRs. The role of OPRs has been shown to be substantial in moving individuals

from cluster 3 to cluster 4 via cognitive negative message framing. It has been discussed that the persuasive power of OPRs could lead to more permanent changes in behavioural intention and behaviour compared to the more temporary persuasive power of emotions (Petty and Cacioppo, 1986; Ledingham, Bruning and Wilson, 1999). Indeed, in terms of the relative effect of emotions, belief and OPRs in cluster 3, the cognitive negative message frame is fuelled by belief and OPRs, whereas the affective positive message frame is fuelled by belief and happiness. In addition, the cognitive negative message frame in group 16 in cluster 3 leads to a bigger percentage of individuals moving from uncertain to certain attitudes than for any of the message frames in cluster 1, which itself is associated with behaviour change that is more persistent over time (Tormala and Rucker, 2018). Hence the three-step clockwise customer journey (3→2→1→4) is potentially obsolete given the effectiveness of the one-step journey (3→4) based on the persuasiveness of OPRs. This is an important conclusion regarding the ELM and its use within persuasion.

Wherever an individual starts their journey, and wherever that journey takes them, it would seem that there are two finishing points, cluster 2 and cluster 4, where individuals have high attitude certainty. Whether they get there and how they get there depends on individuals' circumstances and communicators' successful employment of effective marketing strategies. The discussion of customer journeys is now followed by this study's contributions to knowledge.

7.7 Contributions to knowledge

This PhD research study has made various contributions to knowledge. This section is structured as follows. Contributions to knowledge relating to OPR are followed by contributions regarding matching effects and other contributions to knowledge.

7.7.1 OPRs

The first set of contributions to knowledge relate to OPRs.

7.7.1.1 Affective trust

For the first time within a public relations study, the dimension affective trust has been included. In previous studies, only the cognitive elements of trust had been measured. By introducing affective trust, it has been possible to account more fully for the influence of OPRs on attitude and behavioural intention. Within this study, there was a statistically significant relationship between affective trust and affective attitude in two of the groups, namely groups 14 and 16 in cluster 3 (cognitive negative and affective negative message frames). Had affective trust not been included, a complete pathway from control mutuality to new behavioural intention would have been discounted in group 16 (as shown in diagram 16, appendix 13).

7.7.1.2 Three elements of cognitive trust

In addition to the inclusion of affective trust, the three elements of cognitive trust have been treated as separate elements within a model for the first time within a public relations study, rather than being collapsed into a single cognitive trust dimension. This allowed the presence and size of relationship between cognitive trust elements and attitudinal variables to be assessed in a quantitative study. In this PhD research study, for the cognitive negative frame in group 16 in cluster 3, integrity, but not dependability and capability, had a statistically significant relationship with cognitive attitude, when focusing on the promotion of physical exercise. Separating the cognitive trust elements gives more information on how to maximise persuasiveness. For example, communicators could focus on improving individuals' perception of organisational integrity, to maximise the influence of the statistically significant pathway between control mutuality and new behavioural intention that passes through integrity (as shown in diagram 16, appendix 13). However, in group 16 in cluster 3 there would be little point improving individuals' perception of capability when devising a campaign, as there is no statistically significant relationship between capability and cognitive attitude and hence capability has no total effect on new behavioural intention.

7.7.1.3 A new model of OPRs

The results for all message frames illustrate how all four trust dimensions, and particularly affective trust, should be included in a persuasion model, to understand which of these variables are influencing attitude and behaviour. This PhD research study tested hypotheses to find that there were statistically significant connections

between the cognitive trust variables and affective trust, and between trust variables and attitude, in at least one instance in the 21 groups, except between dependability and cognitive attitude, as summarised in table 6.4 on page 261. There was also a connection between control mutuality and belief in two instances.

Based on these findings, a proposed new model of OPRs is included in figure 7.1 below. This model includes the OPR dimensions and elements used within this experiment: control mutuality, capability, integrity, dependability and affective trust. It additionally includes the connections between these dimensions and the variables cognitive attitude, affective attitude and belief. It does not include the OPR dimensions satisfaction and commitment, which OPR literature has classed as unessential (Wang, Ni and De la Flor, 2014; Ni et al., 2019). It also does not include a connection between dependability and cognitive attitude, as no evidence was found for this connection. It is concluded that dependability actually predicts affective trust while remaining a separate construct.

This proposed model of OPRs should be tested for a particular social marketing purpose (for example, physical exercise, smoking cessation) using different message frames to calculate the most effective OPR dimensions for each message frame within four clusters, using the questionnaire in this experiment, shown in appendix 5. This questionnaire includes a revised measurement scale for trust, as proposed in the next section.

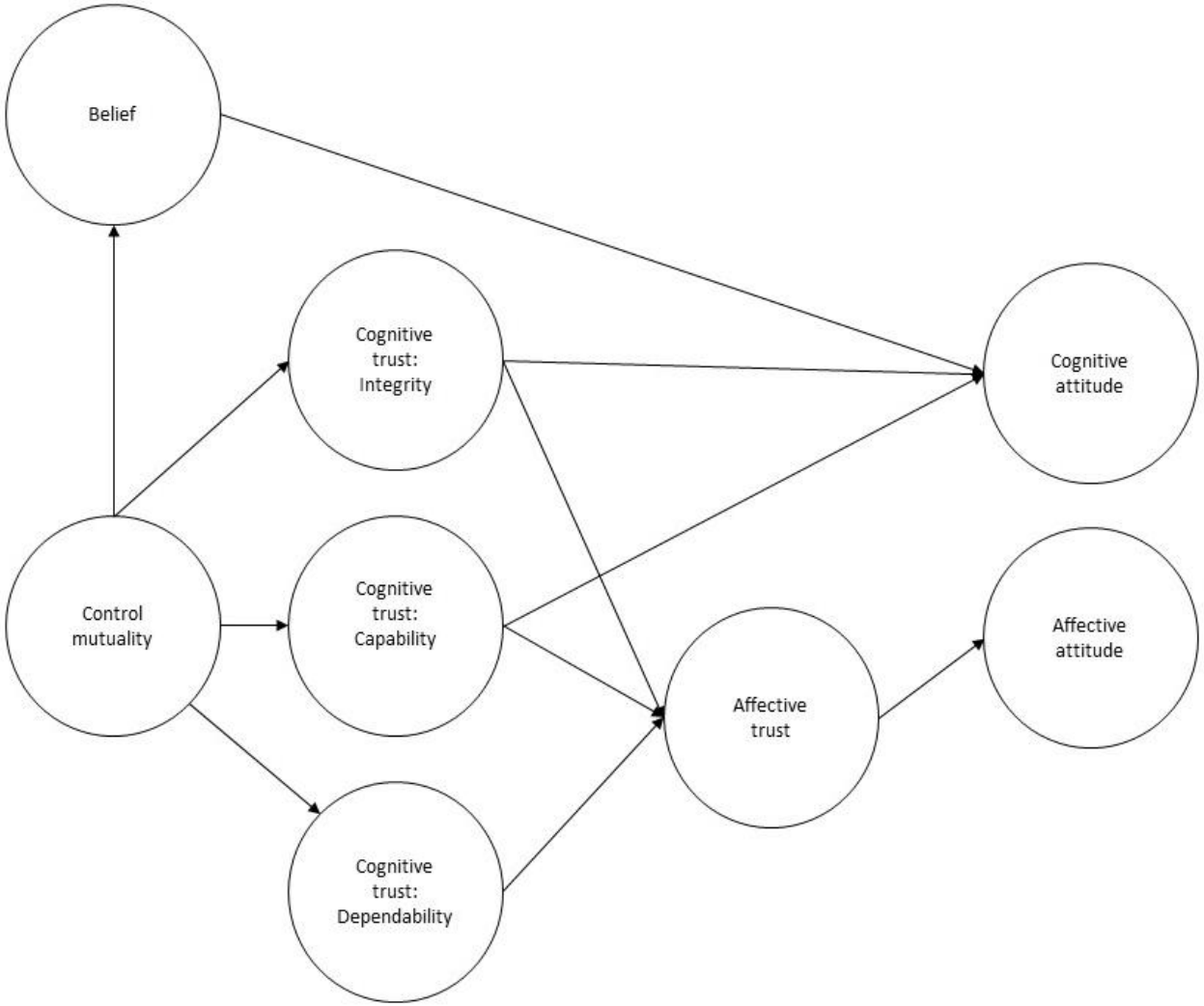


Figure 7.1: Proposed new model of OPR

7.7.1.4 A new measurement scale for trust

As affective trust plays an important role in group 16 in cluster 3 in this experiment, a new 11-point measurement scale for trust is proposed containing indicators for capability (2), integrity (2), dependability (2) from Hon and Grunig (1999) and the indicators for affective trust from McAllister (1995) (5). This new scale is required to properly model the influence of OPRs on RAA constructs attitude, behavioural intention and behaviour. The new proposed trust scale is as follows:

1. This organisation treats people like me fairly and justly. (Integrity)
2. Whenever this organisation makes an important decision, I know it will be concerned about people like me. (Integrity)
3. This organisation can be relied on to keep its promises. (Dependability)
4. I believe that this organisation takes the opinions of people like me into account when making decisions. (Dependability)
5. I feel very confident about this organisation's skills. (Competence)
6. This organisation has the ability to accomplish what it says it will do. (Competence)
7. The organisation and I have a strong relationship. We both freely share our ideas, feelings and hopes. (Affective trust)
8. I can talk freely to the organisation about difficulties I am having and know that it will want to listen. (Affective trust)
9. I would feel a sense of loss if I was no longer able to have a relationship with the organisation. (Affective trust)
10. If I shared my problems with the organisation, I know it would respond constructively and caringly. (Affective trust)

11. I would have to say that the organisation and I have made considerable investments in our relationship. (Affective trust)

7.7.1.5 OPRs and message framing in clustered data

This research study looked at the influence of OPRs following marketing communications for the first time in a public relations study. It also looked at the influence of OPR in clustered data for the first time as opposed to a full dataset. The existence of statistically significant relationships between the cognitive trust variables and affective trust, and between trust variables and attitudinal variables, was dependant on the cluster (defined by attitude certainty and elaboration likelihood) and the message frame received by respondents (four messages: cognitive/affective, negative/positive) within a total of 21 data groups. As OPRs have not previously been measured within four such clusters as part of an experiment containing differing message frames, the results of OPR dimensions shown in section 6.3.1 on pages 247 to 261 in chapter 6 are themselves a contribution to knowledge. Although there were typically relationships between the OPR dimensions themselves in the data groups, OPR played its biggest role in group 16 following the cognitive negative frame in cluster 3 (low elaboration likelihood, low initial attitude certainty), as discussed next.

7.7.1.5.1 Influence of OPR within cognitive negative framing

A particular contribution to knowledge is the role of OPRs in the cognitive negative message frame in group 16 in cluster 3 (low elaboration likelihood, low initial attitude certainty). This is the only group within a cluster where OPRs played a role yet the discovery of the role is potentially very important for social marketers. Not only do OPRs play a bigger role than emotions and belief in influencing new behavioural intention following this message frame, they lead to improvements in behavioural intention (and hence behaviour) that are more enduring compared to the short-term influence of emotions (Petty and Cacioppo, 1986; Ledingham, Bruning and Wilson, 1999), particularly as the cognitive negative frame also leads to the second largest increase in attitude certainty among groups in cluster 3 (table 6.13 on page 312), also associated with more enduring improvements in behaviour (Tormala and Rucker 2018). While the multigroup analysis showed no significant difference between path coefficients for the relationship between attitude and new behavioural intention for the cognitive negative and affective positive message frames, the enduring effects of OPRs are highly desirable, making the cognitive negative message frame a viable option along ELM's peripheral route for 50% of adults starting their customer journey to meeting NHS exercising targets.

Interestingly, the only significant path coefficient differences between group 15 (most effective message frame: affective positive) and groups 16 and 17 (joint second most effective message frames: cognitive negative and cognitive positive) in cluster 3 were for subjective norm and initial behavioural intention.

These are more difficult for organisations to manipulate in their favour compared to OPR dimensions. Indeed, if the subjective norm were for people to do very little exercise in an area, it would be almost impossible to increase exercising across the board in cluster 3, to influence subjective norm and hence behaviour, making it difficult to influence individuals via subjective norm to improve campaign effectiveness.

The effect of OPRs was unique to one cluster out of four cluster but is a potentially persuasive force for a quarter of the adult population when clustered this way. It demonstrates how the persuasive power of OPRs may be lost due to the problems of presumed homogeneity, when results are analysed as one group rather than separated into smaller clusters and groups.

7.7.2 Persuasion

OPRs were not found to challenge the influence of matching effects as they did not have a statistically significant effect on new behavioural intention in the lead strategy in the clusters. Nonetheless, the fact that OPRs plays a role in the peripheral customer journey from cluster 3 to cluster 4 has repercussions for assessing the value of the ELM and the wisdom of selecting the message with the biggest influence on new behavioural intention due to matching effects.

7.7.2.1 Matching effects

Contributions to knowledge regarding matching effects relate to elaboration likelihood, message content and positive/negative message valence.

7.7.2.1.1 Elaboration likelihood constrained high

The results of matching/mismatching effects for unconstrained elaboration likelihood and elaboration likelihood constrained high have not been tested before in the same study. When elaboration likelihood is constrained high, Teeny et al. (2021) claim that matching effects (such as a cognitive message-framing being the most effective for those with a cognitive attitude base) can act as an additional argument or can bias cognition during primary cognition. This PhD research confirmed (via the effects of the emotions guilt and anger on belief) that elaboration is constrained high during primary cognition for respondents in cluster 1. However, the matching effects did not behave as expected.

In cluster 1, the affective negative message frame was the most effective. Matching cognitive message frames would have been jointly the most effective had the cognitive messages been more complicated (abstract) in content. Multigroup analysis revealed that self-efficacy leads drives the leading affective negative message frame in cluster 1. It would have been an error though to assume that the amplification hypothesis was behind the leading affective

message in cluster 1, leading to a mismatching affective message frame for individuals with an uncertain attitude.

Further understanding comes from the investigation of cluster 2 (high elaboration likelihood, high initial attitude certainty) where the matching effects behave as expected, as the cognitive positive and negative message frames were jointly the most effective. There high elaboration likelihood nullifies or weakens the effects of the amplification and crystallisation hypotheses for those with a cognitive attitude, as long as the message permits further cognition.

Interestingly though, there is no evidence of matching effects influencing belief as an additional argument or bias during primary cognition as matching effects appear to influence new behavioural intention directly in clusters 2, 3 and 4, which is an additional contribution to knowledge.

7.7.2.1.2 Influence of message content

Following on from the previous point, an additional contribution to knowledge is that the results for the most effective message frame appear to be dependent on message content. In cluster 1, an affective negative message frame was the most effective message, despite elaboration being high. This is not actually due to the amplification hypothesis. In fact, those with high elaboration would prefer a cognitive message frame. Concrete messaging does not contain enough new information for a cognitive message frame to be the most effective.

7.7.2.1.3 Influence of valence

Previous matching effects studies have issued cognitive and/or affective message frames without considering the valence of messages. In this PhD study matching effects have for the first time been found to be dependent on the valence of a message. For example, in cluster 3, an affective positive message frame in group 15 was technically the most effective, as predicted, due to the amplification hypothesis, when a cognitive attitude held with uncertainty is most influenced by an affective frame. However, the negative affective message in group 14 was the least effective message frame.

7.7.2.2 Two dimensions of attitude

For the first time in a public relations study focusing on OPRs, attitude has been separated into cognitive and affective dimensions. By measuring both affective and cognitive dimensions of attitude, it has been possible to study the pathways between constructs more closely.

Separating attitude into two dimensions was particularly interesting when the OPR variable affective trust had a medium-sized effect on new behavioural intention via affective attitude. Without this connection between affective trust and affective attitude, a pathway from OPR dimensions to new behavioural intention would have been lost. The existence of the connection gives social marketing practitioners an alternative and possibly more effective solution when targeting those with low elaboration likelihood. As separating attitude into

cognitive and affective dimensions provides more detailed results, the scales used to measure affective attitude and cognitive attitude (in appendix 6) will also prove useful for public relations research.

7.7.2.3 Reasoned Action Approach

This PhD research study verified relationships between constructs in the RAA, with variables having statistically significant relationships in at least one of the 21 models following the persuasion appeal (as shown in table 6.6 on page 275 and table 6.7 on page 278). There were contributions to knowledge regarding the influence of emotions on belief and directly on affective attitude, and the influence of the variables subjective norm and self-efficacy. These contributions are described in the following sections.

7.7.2.3.1 Emotions influencing affective attitude

This study provided further evidence that emotions can have a direct link with affective attitude, without needing an indirect link via belief, subjective norm or self-efficacy as a background factor. This contradicts the RAA's sufficiency assumption (Fishbein and Ajzen, 2010; Ajzen, 2011) as previously challenged by McKeever and McKeever (2017) and others. As the path diagrams in appendix 13 verify, these direct effects occurred in eight out of 21 groups (diagrams 1, 3, 4, 5, 6, 9, 15, 16). In these eight groups, happiness has a positive direct effect, gratitude has a positive direct effect and guilt has a negative direct effect. In contrast, anger, fear and sadness do not have a direct effect on affective attitude in any of the 21 groups.

7.7.2.3.2 Subjective norm and self-efficacy

It is an interesting contribution to knowledge that subjective norm and self-efficacy play their largest role in cluster 3 when elaboration likelihood is low and attitude certainty is low. It is additionally intriguing that subjective norm does not play a role following the cognitive negative message frame in group 16 in cluster 3, when OPRs influence new behavioural intention. That low elaboration likelihood influences subjective norm for three messages (in groups 14, 15 and 17), but does not initiate the persuasive power of subjective norm following a cognitive negative message frame, is a fascinating result for OPR researchers. Subjective norm plays no sizeable role in the other three clusters. Self-efficacy plays an additional role only in cluster 1, in making the affective negative message frame the leading frame.

7.7.3 Social marketing theory

This study contributes to social marketing theory by investigating the potential problems of heterogeneity, when analysing a complete dataset leads to misleading results. In this study, the dataset was divided into four clusters, by elaboration likelihood and attitude certainty. Not only was it shown that message effectiveness can be improved by tailoring messaging according to both elaboration likelihood and attitude certainty, it was demonstrated that focusing on improving OPRs is a viable option within a social marketing campaign for those in cluster 3 (low elaboration likelihood, low initial attitude certainty).

The role of OPRs role in the cognitive negative message frame in group 16 in cluster 3 challenges the view that making a social exchange within messaging, by typically issuing affectively based messages focusing on the hidden pleasurable aspects of an activity rather than cognitively based instructions to change behaviour, will lead to the most effective results (Hastings and Domegan, 2014).

7.8 Managerial and policymaker implications

The WHO has recommended that effective communications be employed to tackle the incidence of obesity (WHO, 2018). The results of the experiment conducted within this PhD research study, and the ensuing discussion, can be drawn from to compile advice relating to the microelement of message framing for practitioners aiming to increase levels of physical exercise via a social marketing campaign.

The first step would be for practitioners at integrated healthcare providers to conduct a survey of individuals, so they can be gathered into four clusters according to their elaboration likelihood and attitude certainty, on the topic of physical exercise, prior to the delivery of strategic messaging for each of the four clusters. The survey should include one of the marketing messages used in this PhD research study, such as the cognitive positive message frame, included in appendix 5, to test elaboration likelihood. This should be followed by questions measuring attitude, attitude certainty and belief (a useful variable for cluster 4 as described below) also included in appendix 5.

Once finalised, the survey could, for example, be conducted via GP surgeries with invitations to take part in the survey delivered by text, similar to when GPs request blood pressure results from patients (Falkirk Herald, 2019). The text typically links through to a web page where patients enter their answers. Those who respond could be targeted by the local NHS integrated healthcare system

with appropriate message framing according to whether they fit into cluster 1, 2, 3 or 4, as described below in sections 7.8.1 to 7.8.4. The messaging would be based on the findings of this PhD research study. Those who do not respond could receive repeated requests to complete the survey as the persuasiveness of repetition can lead to a more certain attitude when considering taking the survey (Tormala and Rucker, 2007, 2018) and is a proven messaging strategy (Weinstein and Mayer, 1986). A single message could be issued as a separate campaign to those who never respond to the survey or where healthcare authorities find issuing tailored message-framing too complicated or expensive, as described in section 6.8.5.

7.8.1 Cluster 1: high ELM, low certainty

To influence those on the central route in cluster 1, with high elaboration likelihood but low attitude certainty, two options are recommended: a cognitive message frame or an affective negative message frame, depending on the channel being used and opportunities to win individuals' attention.

A cognitive message frame (either positive or negative) is firstly recommended as individuals are interested enough in the topic of physical exercise and motivated enough to process more information on it. However, the message must contain abstract messaging so that there is enough information to stimulate further cognitive processing. This may be possible on communications channels such as websites, leaflets and magazine features.

On other channels where it is not possible to include a lot of information, such as on social media sites such as Tik Tok, Instagram and X (Twitter), practitioners could attempt to provide links on social media posts to where more information exists, such as a website. Click through rates are often quite low though, such as 1% (Barker, 2023) due to the need for effective attention strategies (Galloway, 2017). Practitioners should be aware that happiness and gratitude are persuasive in cluster 1 following cognitive messages and should aim at generating these emotions from messaging.

Alternatively, practitioners could use affective negative message-framing, the lead message frame in cluster 1 in this experiment. Given the “infoglut” individuals are regularly subjected to (Galloway, 2017), it may be that using the affective negative message frame is the most practical strategy for the 2020s, given that winning attention for a more detailed, abstract message can be difficult (McKie and Willis, 2015). This could be seen as a message compromise as a social exchange within social marketing, with affective messaging utilised to create a higher level of behaviour change (Hastings and Domegan, 2014). As previously mentioned, using an affective negative message frame would move some individuals along a customer journey into cluster 2 (high ELM, high certainty). Practitioners should be aware that happiness encourages persuasiveness but anger discourages persuasiveness in cluster 1 following an affective negative message frame and should tailor their message frames accordingly.

Whichever message frame is used it should be ongoing not episodic (Johnston and Lane, 2018), appealing to men as well as women to maximise effectiveness, as recommended in the review of the *Better Health* campaign (Public Health England, 2021c).

7.8.2 Cluster 3: low ELM, low certainty

To influence those at the start of the peripheral route in cluster 3, with low elaboration likelihood and low attitude certainty, it is recommended that practitioners use a cognitive negative message frame, which is effectively the joint second most impactful message in cluster 3. As noted above, the cognitive negative message frame encourages individuals to rely on their existing relationship with the healthcare system. There are four key advantages:

- This message frame may lead to more persistent behaviour change, using the persuasive power of OPRs and self-efficacy to improve behavioural intention rather than the less-enduring persuasive power of happiness.
- The cognitive negative message frame leads to the second highest impact on attitude certainty in cluster 3, contributing to higher levels of consistency between behavioural intention and behaviour.
- The cognitive negative message frame may be a more cost-effective social marketing option for practitioners, as it draws on existing relationship capital established over many years.

- Focusing on building OPRs not only encourages physical exercise in cluster 3, it encourages many other attitudes and behaviours that are desired by an integrated healthcare system, such as smoking cessation, sexual health and customer satisfaction.

There are various ways to improve OPR, within the antecedents, concept and consequences stages of Broom, Casey and Ritchey's (1997) model, as explored in section 2.1. For example, practitioners could develop an effective relationship cultivation strategy. This could employ the relationship cultivation strategies mentioned in chapter 2, such as access, positivity and openness. Conflict strategies, such as dual concern, to find a balance between the interests of the organisation and the public, could also be included within such a document, where necessary (Hon and Grunig, 1999). The dual concern strategy has parallels with partnership building within social marketing (Duane, 2012), as both aim to bring parties closer together to better meet an end result.

In addition, practitioners should seek to maximise OPR by reviewing how dialogue is approached, with respect to the five dialogic principles of Kent and Taylor (2002): mutuality, empathy, risk, commitment to dialogue and propinquity. As propinquity includes engagement, the review could also list how to build the dimensions of engagement: affective commitment (identifying with an organisation, emotional attachments), positive affectivity (such as passion and excitement) and empowerment (self-efficacy) when listening to individuals (Mael and Tetrick, 1992; Kang, 2014).

Finally, within the consequences stage, an organisation could build examples of dependability, integrity and affective trust into its regular messaging. Examples of capability are not required as capability did not have a significant effect in group 16 as shown in diagram 16 in appendix 13. This would build trust (Hon and Grunig, 1999), and thereby influence attitude, behavioural intention and behaviour across a raft of desired behaviours, including physical exercise.

Once again, the use of the message frame should be ongoing not episodic (Johnston and Lane, 2018) appealing to men as well as women to maximise effectiveness, as recommended in Public Health England (2021b). Practitioners should aim to minimise the experiencing of guilt, as this emotion has a negative effect on persuasiveness in cluster 3 following a cognitive negative message frame.

7.8.3 Cluster 2: high ELM, high certainty

To influence those in cluster 2, a cognitive positive or cognitive negative message frame is recommended. Those in cluster 2 are interested in the cognitive content of the message and not the positive/negative valence. As individuals in all four groups are only influenced by initial behavioural intention and extraneous variables, the content of the message appears to act as a nudge to perform the intended behaviour. Nudges to continue hitting exercising targets are recommended in a review of the *Better Health* campaign (Public Health England, 2021c). From the list of nudges described by Handel (2015),

the most relevant to messaging on physical exercise is perhaps the category of nudge called earmarking, which in this case could be regular reminders for individuals to do their weekly 75 minutes of physical exercise. As individuals have high elaboration likelihood, the messages should be abstract not concrete, perhaps containing interesting weekly facts on the benefits of physical exercise, latest research, new products or case studies.

7.8.4 Cluster 4: low ELM, high certainty

To influence those in cluster 4, two messages frames are recommended. A cognitive positive message frame is recommended for those who have higher levels of ambivalence despite holding a cognitive attitude held with certainty. For example, they could be certain that exercise is good for you but also certain that exercise is more beneficial for those with health problems. These are the individuals who are responding to the predictions of the amplification hypothesis, and therefore require a matching cognitive message, as previously discussed above. The cognitive positive message frame could act as a similar type of nudge to the one described for cluster 2 above, although as elaboration likelihood is low, not high, the message should be simple and concrete, not complicated and abstract, perhaps as a simple reminder by text to do a weekly 75 minutes of vigorous exercise. As mentioned, nudges to continue hitting exercising targets are recommended in Public Health England (2021c).

In addition, an affective negative message frame is recommended for those with low levels of ambivalence. These are the individuals who are responding to the predictions of the crystallisation hypothesis. The affective negative message could be a nudge formed by simple framing (Handel, 2015), such as a simple advertisement-style image containing a sad emoji face and the words: “Me not meeting my exercise goal.” The variable belief should be used to sub-cluster individuals into two groups using a median split: (1) belief high (representing low levels of ambivalence) and (2) belief low (representing high levels of ambivalence).

7.8.5 Issuing a single message frame

Recognising that there will be some individuals who never complete the introductory survey from GP surgeries, and equally recognising that some NHS integrated care systems will not feel capable of conducting a survey and compiling a strategic social marketing plan that involves a range of message frames for different clusters, a public campaign featuring one message frame could be considered. Even though the local population is not being divided into clusters, the local population can still be regarded as belonging to these clusters, and it is a case of deciding which message will be the most effective overall. Although multigroup analysis confirmed that none of the message frames was the most effective in terms of the effect on new behavioural intention, the cognitive negative message frame could be seen as the best alternative should practitioners choose to use one message frame. The reasons for this are now listed, cluster by cluster.

- **Cluster 1**: A cognitive negative message frame was the second most effective in group 8 in cluster 1, and as previously mentioned, would probably have been the joint leading message frame had the cognitive messages contained more abstract information. A cognitive negative message frame also led to the greatest effect on attitude certainty in cluster 1.
- **Cluster 2**: A cognitive negative message frame is jointly the most effective marketing message in group 12 in cluster 2, possibly to prompt nudge effects, such as earmarking (reminding individuals to undertake regular activities).
- **Cluster 3**: A cognitive negative message frame is realistically jointly the second most effective marketing message and has been seen to be a highly viable campaign in group 16 in cluster 3, as it would lead to more persistent behaviour change, compared to an affective message frame, due to the role of OPRs. It is also the message frame with the second greatest effect on attitude certainty.
- **Cluster 4**: Although a cognitive negative message frame is not a leading message frame, individuals in this cluster have already made a customer journey (most likely from cluster 3 to cluster 4). Despite missing out on the nudge effects a leading message (in this case cognitive positive or affective negative) may have prompted, individuals have high attitude certainty already and behaviour is likely to be relatively persistent over time. Those in cluster 4 are already meeting their weekly exercising goal of 75 minutes of vigorous exercise therefore it is not essential for cognitive negative message-framing to be effective in this cluster.

Social marketing featuring the cognitive negative message frame could be conducted in various ways. Paid-for social media advertising, targeting those in a particular area aged 19 to 64, could be complemented with bus stop advertising and posters on trains, for example. However, the message must work on two levels. It must be abstract enough for those in clusters 1 and 2 and yet concrete enough for those in cluster 3, who are possibly responding to a nudge effect. For example, the message could use catchy headlines and pictures that work as a cue effect and nudge effect. It could also include more detailed information for those who wish to read it.

In summary of section 7.8, integrated healthcare social marketing practitioners are advised to conduct a survey so individuals in their area aged 19 to 64 can be divided into four clusters (by elaboration likelihood and attitude certainty) for tailored social marketing messaging. A single cognitive negative message frame could also be considered when communicators are not able to deliver tailored messages to clusters, and/or to communicate with those individuals an initial survey was unable to reach. This advice on the microelement of message-framing would form part of a larger social marketing campaign.

7.9 Limitations

The results of this PhD research study should be viewed with respect to the following research limitations.

Firstly, the number of responses per message frame within each group is acceptable but relatively low (mean of 49, minimum of 32, maximum of 72). The number of responses for the most part meets the sample size requirement set out in Hair et al. (2017) for partial least squares regression. This is particularly true for the new behavioural intention construct within the 21 groups, which is used for multi-group analysis. Hair et al. (2017) recommends a minimum sample size of 41 to detect an R^2 of 0.25 when a variable has four predictors (in this case the four predictors are initial behavioural intention, self-efficacy, subjective norm and attitude), for a significance level of 5% and a statistical power of 80%. This has been achieved in 16 of the 21 groups, with the number of responses only a few responses short in the remaining five (32, 38, 39, 38, 40). However, as R^2>0.25 in these five groups (R^2=0.35, 0.76, 0.51, 0.47, 0.30), fewer responses would be required at these levels of statistical power and significance: for example, 18 responses are recommended to detect an R^2 of 0.50. For a lower probability of error, such as a significance level of 1%, a higher number of responses per message frame per cluster would be required: in this situation, a minimum sample size of 58 is recommended to detect an R^2 of 0.25 when a variable has four predictors.

There is the limitation associated with the pairwise testing of groups within multigroup analysis (pages 284 to 295), due to the potential effect of the family-wise error, also known as alpha inflation (Hair et al., 2024; Cheah, Amaro and Roldàn, 2023). Although the alpha value for statistical significance is set at a specified value within research (in this case $\alpha=0.10$), comparing multiple tests within multi-group analysis can lead to a higher risk of erroneously rejecting a null hypothesis within the analysis (that is, a type 1 error: accepting significance for an alternative hypothesis when there is none). However, there is debate as to whether methods to correct alpha inflation, such method as the Holm-Bonferroni approach, are overly conservative, which could lead to type 2 errors, when an alternative hypothesis is erroneously rejected in favour of the null hypothesis (Giacalone et al., 2018; García-Pérez, 2023).

As with most social science experiments, pure random sampling could not be employed. Respondents were gathered using Facebook page boosts. Although this meant respondents would self-select into the group, they were approached as members of the 19-to-64 age group in Bedfordshire without intentional bias. This is akin to approaching members of the public randomly in a public place or via telephone or email, with individuals making a conscious decision as to whether or not to respond to the invitation to take part in the experiment, as is the case for most consumer research. Many academic experiments do not employ pure random sampling. For example, Clarkson, Tormala and Rucker (2011) and Ryffel and Wirth (2016) recruit undergraduates in partial fulfilment of a course requirement, which could lead to bias (Ashraf and Merunka, 2016).

The study measures behavioural intention, before and after the message, but does not measure actual behaviour. Additional research would be required to study the relationship between behavioural intention and behaviour over time for the promotion of physical exercise, such as the possible existence of and nature of an intention-behaviour gap (Sheeran and Webb, 2016).

Following Ajzen's (2019) lead, belief was measured using one indicator. Using two or three indicators would have brought the mathematical opportunity of the value of belief to be a fraction (for example, an average of 4.5 instead of 5), perhaps fine-tuning the amount of variance in affective and cognitive attitude ascribed to belief and hence R^2 for these two variables.

Finally, it should be noted also that this experiment was limited to the role of OPRs within the microelement of message framing, not a full social marketing campaign.

7.10 Future research

Several areas have been identified for future research.

Future research could investigate further the conditions for which OPRs have an influence on attitude, following the issuing of a message. It would be interesting to understand more why OPRs influence belief and attitude when emotions fail to influence belief, as discovered in cluster 3 in this PhD research study. Understanding the mechanisms behind why OPR influences attitude for one message in cluster 3 (cognitive negative message fame in group 16), whereas subjective norm influences new behavioural intention for the other three message frames in cluster 3, would also be of huge interest. It would also be useful to divide cluster 4 into two sub-clusters to investigate whether OPRs play a role for those with high attitude certainty yet low elaboration likelihood and low processing fluency.

More research could also be conducted into the effect of multi-party relationships, as requested by Health (2013) and as investigated by Atwell Seate et al. (2022) within crisis weather forecasting. It could be seen whether better relationships between partners in the BLMK integrated healthcare system ultimately leads to better levels of OPRs between the healthcare system and the public, as this would potentially bring higher levels of persuasiveness, particularly for those in cluster 3, where OPRs play a persuasive role. Such

research could also add to the literature on partnership-building within social marketing.

It would be interesting to measure OPRs before and after marketing communications messaging, in instead of just after. Within this study, OPR dimensions were measured following the issuing of a message frame, therefore it is not possible to determine whether initial levels of OPR dimensions predicted new behavioural intention indirectly via initial behavioural intention, as it cannot be assumed that OPRs remain unchanged following the message. Indeed, if dialogue is a product in which relationship exists (Kent and Taylor, 1998), a message could improve levels of OPR dimensions such as the elements of trust. As well as new levels of OPR influencing new behavioural intention, initial levels of OPR could predict initial behavioural intention and hence new behavioural intention. This would add to knowledge to fully understand OPRs' role in influencing individuals to engage in physical exercise. Measuring OPR dimensions before and after a campaign would be useful when aiming at building up the level of OPRs via messaging, to see whether OPR dimensions have in fact improved.

Following on from this point, given that OPR dimensions only influenced new behavioural intention in two of 21 groups in this PhD study as a predictor variable, it would be interesting to reconsider the role of OPRs as a moderator variable. Investigating how higher levels of OPR dimensions affect the relationship between belief and attitude, and the relationship between emotions

and attitude, following the four messages, may reveal more about the circumstances in which OPRs play a persuasive role.

Future research could devise or include survey questions on whether elaboration likelihood is constrained high in the current model. This would help with the understanding of whether individuals in clusters 1 and 2 are likely to have elaboration constrained high permanently, or whether their elaboration will drop moving them into clusters 3 or 4.

As elaboration was measured after the message as a response to its content, it would be interesting to measure elaboration likelihood on the topic of physical exercise prior to the issuing of a message frame, as well as afterwards. This would add a level of detail to how an individual has responded to the message. For example, individuals in cluster 4 may decrease their elaboration likelihood as a result of the messaging, having started in cluster 2. It would also be interesting to measure elaboration uniformly following the message, to remove any inaccuracies that emerge due to individuals reporting their elaboration following one of the four message frames. It may be that a new method of assessing elaboration needs to be devised that is not based on responses to a message.

Additional research is required within the four clusters of this PhD study to study the relationship between behavioural intention and actual behaviour over time

for the promotion of physical exercise, such as the possible existence of and nature of an intention-behaviour gap.

Additional research could attempt to identify the extraneous variables that influence new behavioural intention. The extraneous variables also seem to be responsible for the matching effects in the four clusters in this experiment. This challenges the view that matching effects lead to changes in cognition and/or belief as part of the ELM. Learning more about these variables and how they can be included within a persuasion model would make fascinating future research.

This discussion chapter has met the final two aims:

4. **To contribute an updated model of OPR for social marketing campaigns promoting physical exercise**

5. **To report on implications for policymakers and social marketing practitioners on the most effective ways to impact public health**

A closing chapter now concludes this PhD research study.

8. Conclusion

The title of this PhD research study is: *To what extent do organisation-public relationships influence behaviour change in marketing campaigns promoting physical exercise?* To answer this question, a research aim was set: to analyse the relative influence of organisation-public relationships (OPRs), belief and affect on behavioural intention within a social marketing campaign promoting physical exercise. Achieving this aim meant meeting five research objectives.

1. To determine the most effective pathways to influencing behavioural intention using four message frames, in a model containing variables from OPR theory, the RAA and the ELM.
2. To calculate the relative effect of OPRs on behavioural intention compared to affect and belief.
3. To assess the contribution of affective trust to the influence of OPRs.
4. To contribute an updated model of OPRs for social marketing campaigns promoting physical exercise.
5. To report on implications for policymakers and social marketing practitioners on the most effective ways to impact public health

This conclusion is structured as follows. Five sections explain how the research objectives were met. This is followed by a section answering the question incorporated in the title of this PhD research study.

8.1 Meeting of research aim

How the aim of the research was achieved is addressed by focusing on the five research objectives individually.

8.1.1 Most effective pathways to changing behavioural intention

The first objective was to find the most effective pathways to influencing behavioural intention using four message frames, in a structural equation model containing variables from organisation-public relationship (OPR) theory, the Reasoned Action Approach (RAA) and the Elaboration Likelihood Model (ELM). To assess the relative influence of OPRs, an experiment was conducted, clustering respondents into four clusters according to their levels of elaboration likelihood (high/low) and attitude certainty (high/low). Within the four clusters they were grouped according to message framing received at random (four messages: affective negative, affective positive, cognitive negative, cognitive positive). There were 21 groups in total.

The most effective pathways (shown in the 21 path diagrams in appendix 13) differed according to the moderating effects of elaboration likelihood, initial attitude certainty and message frame. Those at the beginning of their customer journeys (when initial attitude certainty was low) were influenced by all the variables within the reasoned action approach to varying extents depending on moderating effects, with belief and the emotions happiness (positive total effect) and guilt (negative total effect) appearing most frequently. In some instances, emotions influenced affective attitude directly not

just as background factors. Self-efficacy and subjective norm generally appeared in path diagrams when elaboration likelihood was low. OPR dimensions only influenced new behavioural intention when elaboration likelihood and initial attitude certainty were low following a cognitive negative message frame. The leading message frames having the biggest impact on new behavioural intention were generally differentiated by matching effects, which impacted new behavioural intention via extraneous variables.

Those at the end of their customer journeys (when attitude certainty was high) were generally influenced by initial behavioural intention and extraneous variables such as those leading to matching effects. OPR dimensions did not influence individuals at the end of the customer journey within this experiment.

8.1.2 Effect of OPR compared to affect and belief

The second research objective explored the relative effects of OPR within the empirical model compared to affect and belief. There were problems associated with assuming the homogeneity of data, with some relationships between variables obscured. When the unclustered data was analysed, OPR dimensions had an influence on new behavioural intention in one instance. For the cognitive negative message frame, OPR had a weaker effect on new behavioural intention than belief and emotions via a single path from control mutuality to belief and cognitive attitude. However, when clustered data was analysed, OPR had a statistically significant effect on new behavioural intention in one instance following the same cognitive negative

message frame via three pathways: one path from control mutuality to belief and cognitive attitude; a second from control mutuality to integrity and then cognitive attitude; a third from control mutuality to dependability, affective trust and affective attitude. This was the case for those with low elaboration likelihood and low initial attitude certainty, when OPR dimensions had a similar, though slightly stronger, effect than emotions and belief. It was concluded that the cognitive negative message frame was indeed the most effective overall for those with low elaboration likelihood and attitude certainty, due to the more enduring effects of OPR on behaviour change and the higher post-message levels of attitude certainty, also associated with more enduring behaviour change.

As seen from the third pathway, the contribution of affective trust to OPR's effect on new behavioural intention was an essential part of this research's analysis, as discussed next.

8.1.3 Contribution of affective trust to influence of OPR

The third research objective was included to assess the contribution of affective trust to OPR's persuasive influence. For the first time within a public relations study, the dimension affective trust has been included. In previous studies, only the cognitive elements of trust had been measured. By introducing affective trust, it has been possible to account more fully for the influence of OPR on attitude and behavioural intention and to use this persuasiveness in an assessment of the best message frame.

While there were only statistically significant relationships between affective trust and affective attitude in two groups in this study (groups 14 and 16 in cluster 3), affective trust played an important persuasive role. Despite there being no statistically significant relationship between attitude and new behavioural intention following one of these instances (group 14), nullifying the influence of OPR on new behavioural intention, affective trust played a persuasive role in the other (group 16), in a situation of high interest to social marketers, as respondents were the key audience, having low elaboration likelihood and low attitude certainty. They are not particularly interested in the topic and are hard to influence. As affective trust had a medium-sized effect on affective attitude in this instance, including affective trust as a dimension of OPR was essential for maximising OPR's total effect on new behavioural intention. Due to the stability of OPR levels, this finding makes all the difference when influencing individuals on the peripheral persuasion route to enduring behaviour change.

It is because of this contribution to an OPR by affective trust that a new model of OPRs was contributed to public relations literature, to capture how the relative effect of OPRs and the contribution of OPR dimensions can be accounted for conceptually, described in the following section.

8.1.4 Updated model of OPR for social marketing campaigns

This PhD research study contributes an updated model of OPR, as shown in the repeated figure 7.1 below. This is the first time an OPR model has been proposed that includes affective trust and separate elements of cognitive trust. The OPR dimensions control mutuality, integrity, dependability, capability and affective trust are included in the model. The dimensions satisfaction and commitment were not included, having been deemed less essential to quantifying the persuasiveness of OPR in previous research.

The diagram shows connections between the three elements of cognitive trust (integrity, dependability, capability) and affective trust. It also shows the connections between OPR dimensions and the RAA variables belief and attitude (shown as cognitive attitude and affective attitude). There is no connection between dependability and cognitive trust, as this connection was absent in the results of this PhD research study. The connection between belief and cognitive attitude has been included to show the pathway from control mutuality to cognitive attitude via belief.

A new measurement scale for OPR has been contributed by this PhD research study featuring indicators for control mutuality, capability, integrity, dependability and affective trust.

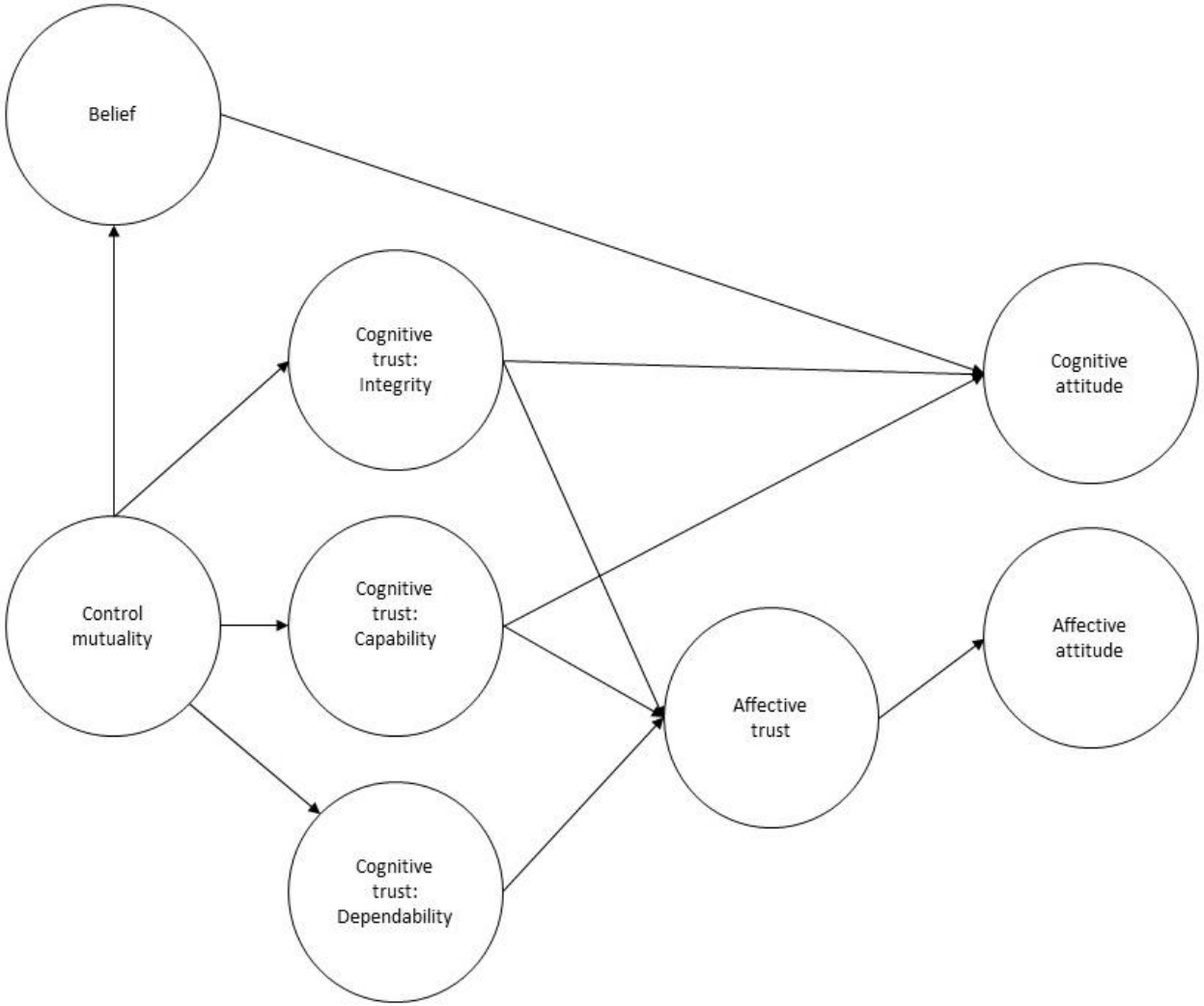


Figure 7.1 repeated: Proposed model of OPR

8.1.5 Implications for policymakers and social marketing practitioners

The fifth research aim was to report on implications for policymakers and social marketing practitioners. In this PhD study, message effectiveness improved by tailoring message frames according to both elaboration likelihood and attitude certainty. In addition, OPR's role challenged the view that making a social exchange within messaging, by typically issuing an affectively based message frame, will lead to the most effective results for those starting on the peripheral route with low elaboration likelihood. This finding could influence the direction of future research into PSA effectiveness, particularly when considering the peripheral customer journey when individuals have low elaboration likelihood. However, OPRs did not play a persuasive role within three of the four clusters. Recommendations for practitioners within these three clusters were therefore not based on the persistent persuasiveness of OPRs. A cognitive negative message frame is recommended when organisations only wish to circulate one message to individuals, though, as it is a strongly performing message frame for most individuals, in clusters 1, 2 and 3.

8.2 Extent OPR affects behaviour change

The title of this PhD research study is: *To what extent do organisation-public relationships (OPR) affect behaviour change in social marketing campaigns promoting physical exercise?*

It has been concluded that the answer to the question is not straight-forward, particularly as social marketing campaigns contain a whole realm of activity not just messaging. When focusing on the important role of message-framing, how OPRs' influence is measured must be determined before an answer can be proposed. Previous public relations studies measured OPRs' influence on attitude at one point in time, concluding that OPRs could have a sizeable statistically significant relationship with attitude. However, as improving attitude and behaviour means influencing variables such as belief, emotions or OPR dimensions, typically via messaging, it is an OPR's contribution to the impact of messaging that is of interest, not the fact that OPR influences initial levels of attitude. In other words, when new levels of attitude and behaviour are compared to former levels following messaging, it is interesting to know whether the difference can be attributed to some extent to OPRs.

Realising that the effect of OPRs are more meaningful when compared to the effect of other variables, this research study used SEM to compare the influence of OPR with that of belief and emotions. Generally, at the start of customer journeys on the peripheral and central routes, OPRs had no influence on new levels of behavioural intention. Belief generally had a more persuasive effect than emotions with OPRs having no effect. OPRs did, uniquely, have a persuasive effect when elaboration likelihood was low and attitude certainty was low following a cognitive negative message frame. Within this group of respondents, OPR dimensions had a higher influence on new levels of behavioural intention than emotions or belief.

The role of OPR could easily be underestimated from these results though. The fact that it only played a persuasive role in one instance should not be misunderstood. This experiment divided respondents into four clusters. Hence the result that OPRs play a persuasive role in one cluster implies that OPRs could be used to promote physical exercise effectively for a quarter of the adult population. When it is considered that half of the population appeared to be already meeting the NHS's physical exercise targets at the end of their customer journeys, the findings can be reframed to highlight that OPRs could play a persuasive role in campaigns for half of those starting a customer journey to meeting their NHS exercising targets, specifically when elaboration likelihood is low.

While it is not a surprise that OPRs play a role for those with low elaboration likelihood on the peripheral route, while those on the central route prefer cognitive processing, the confirmation of this impressive result regarding the role of OPRs, and the finding that it derives from cognitive negative message-framing, are significant findings for public relations researchers and social marketing practitioners alike, particularly as the effect of OPRs on new behavioural intention was boosted by the dimension affective trust, previously excluded from previous OPR studies.

The answer to the question posed in the title of this study also depends on the dependant variable studied. Behavioural intention, not behaviour, was chosen as the key dependant variable in this study. Behaviour was omitted to keep the experiment cross-sectional in nature and the collection of data to a manageable task. Despite this it can be presumed that OPRs will still have a larger effect on behaviour than belief

and emotions, following the cognitive negative message frame in cluster 3, due to the mediating role of behavioural intention in the RAA.

Future research could examine the relationship between behavioural intention and behaviour when promoting physical exercise through a social marketing campaign.

Appendix 1: Conclusions of Broom, Casey and Ritchey (1997)

1. Public relations researchers and practitioners can study relationships as phenomena distinct from the perceptions held by parties in the relationships.

2. The formation of relationships occurs when parties have perceptions and expectations of each other, when one or both parties need resources from the other, when one or both parties perceive mutual threats from an uncertain environment, and when there is either a legal or voluntary necessity to associate.

3. Relationships consist of patterns of linkages through which the parties in relationships pursue and service their interdependent needs.

4. Relationships are the dynamic results of the exchanges and reciprocity that manifest themselves as the relationships develop and evolve, but they can be described at a given point in time.

5. Relationships may lead to increased dependency, loss of autonomy, goal achievement, and structured interdependence in the form of routine and institutionalised behaviour.

6. Relationships have unique and measurable properties that are not shared with the participants in the relationships and that define relationships as being something separate from the participants.

7. The antecedents and consequences of relationships also have unique properties that distinguish them from the relationship.

8. Relationship formation and maintenance represents a process of mutual adaptation and contingent responses.

9. The absence of a useful definition precludes measurement of organisation-public relationships and forces both scholars and practitioners alike to measure one part or another and make potentially invalid inferences about the relationships.

10. The absence of a fully explicated conceptual definition of organisation-public relationships limits theory building in public relations.

Appendix 2: Axioms of OPR from Ledingham (2003)

1. Organisation–public relationships are transactional.

2. The relationships are dynamic; they change over time.

3. They are goal oriented.

4. Organisation–public relationships have antecedents and consequences and can be analysed in terms of relationship quality, maintenance strategies, relationship type, and actors in the relationship.

5. These relationships are driven by the perceived needs and wants of interacting organisations and publics.

6. The continuation of organisation–public relationships is dependent on the degree to which expectations are met.

7. Those expectations are expressed in interactions between organisations and publics.

8. Such relationships involve communication, but communication is not the sole instrument of relationship building.

9. These relationships are impacted by relational history, the nature of the transaction, the frequency of exchange, and reciprocity.

10. Organisation–public relationships can be described by type (personal, professional, community, symbolic, and behavioral) independent of the perceptions of those relationships.

11. The proper focus of the domain of public relations is relationships, not communication.

12. Communication alone cannot sustain long-term relationships in the absence of supportive organisational behavior.

13. Effective management of organisation–public relationships supports mutual understanding and benefit.

14. The relationship perspective is applicable throughout the public relations process and with regard to all public relations techniques.

Appendix 3: Relationship dimensions of Ledingham and Bruning (1998)

1. Investment

2. Commitment

3. Trust

4. Comfort

5. Cooperation

6. Mutual goals

7. Interdependence/power

8. Satisfaction

9. Alternatives comparison

10. Adaptation

11. Non-retrievable investment

12. Shared technology

13. Summate constructs

14. Structural bonds

15. Social bonds

16. Intimacy

17. Passion

Appendix 4: Ethical approval

Manchester Metropolitan University

11/08/2021
Project Title: OPR physical exercise

EthOS Reference Number: 25246

Ethical Opinion

Dear Howard Robert Dobson,

The above application was reviewed by the Business and Law Research Ethics and Governance Committee and, on the 11/08/2021, was given a favourable ethical opinion. The approval is in place until 30/09/2024 .

Conditions of favourable ethical opinion

Application Documents

Document Type	File Name	Date	Version
Project Protocol	Howard_Dobson_Research_Protocol-Template-for-Non-Medical-Research-version-2	19/07/2021	2
Additional Documentation	Questionnaire for Ethos FINAL AUGUST	03/08/2021	3
Recruitment Media	SOCIAL MEDIA ADVERT WORDING	03/08/2021	3

The Business and Law Research Ethics and Governance Committee favourable ethical opinion is granted with the following conditions

Adherence to Manchester Metropolitan University's Policies and procedures

This ethical approval is conditional on adherence to Manchester Metropolitan University's Policies, Procedures, guidance and Standard Operating procedures. These can be found on the Manchester Metropolitan University Research Ethics and Governance webpages.

Amendments

If you wish to make a change to this approved application, you will be required to submit an amendment. Please visit the Manchester Metropolitan University Research Ethics and Governance webpages or contact your Faculty research officer for advice around how to do this.

We wish you every success with your project.

Business and Law Research Ethics and Governance Committee

Business and Law Research Ethics and Governance Committee

For help with this application, please first contact your Faculty Research Officer. Their details can be found here

Page 1 of 1

Appendix 5: Questionnaire

Information sheet

Hello - I am a PhD research degree student at the Manchester Metropolitan University.

I invite you to take part in a research study. Before you take part you need to understand why the research is being done and what it involves. Please read the following information. Ask questions if anything is unclear or if you would like more information.

What is the purpose of the study?

The study is part of a thesis for a PhD research degree at the Manchester Metropolitan University. I am conducting research that will help me understand why people take up physical exercise.

Why have I been invited?

I am approaching adults aged 19 to 64 who live in Bedfordshire. Approximately 800 respondents are needed in total for me to complete the research.

Do I have to take part?

Taking part in the research is voluntary. You are free to withdraw at any time as you fill in the questionnaire, without giving a reason, by closing down the online questionnaire. If you do withdraw, your answers will not be retained within the research.

How do I take part?

You just need to fill in an online questionnaire once. It takes approximately 8 minutes to complete.

Are there any risks if I participate?

There are no risks resulting from participation. If you haven't exercised regularly in a while, and you decide to increase your level of activity, please consult your GP first. For more information please see https://www.nhs.uk/live-well/exercise.

Are there any advantages if I participate?

There are no expenses or payments for participating. Your taking part will inform research that may impact on the promotion of exercise in England. There are, however, no direct benefits to yourself.

What will happen with the data I provide?

Your data will be kept anonymised and completely confidential - I will not know the names of people taking part. No questions seek to identify the identity of respondents. All information collected will be used for future studies looking to understand why people take up physical exercise. The data will only be accessed by myself, a supervisor and markers.

The Manchester Metropolitan University (‘the University’) is the Data Controller in respect of this research and any data that you provide as a research participant.

The University is registered with the Information Commissioner’s Office (ICO), and manages personal data in accordance with the General Data Protection Regulation (GDPR) and the University’s Data Protection Policy.

Your rights to access, change or move your information are limited, as we need to manage your information in specific ways in order for the research to be reliable and accurate. If you withdraw from the study, we will not keep the information about you that we have already obtained.

It is the University’s policy to only publish anonymised data unless you have given your explicit written consent to be identified in the research.

The University never sells personal data to third parties.

For further information about use of your data and your data protection rights please see the University's Data Protection Pages.

What will happen to the results of the research study?

They will be analysed to see how customer relationships encourage people to take up physical exercise. Findings will be used by myself as a public relations practitioner and will be included in my PhD thesis, in academic articles, conference papers and possibly presentations and policy documents.

Who is organising or sponsoring the research?

The research is sponsored by myself. It has not been commissioned by a local authority or NHS trust.

Who has reviewed this research project?

Manchester Metropolitan University's Faculty of Business and Law Ethics Committee has reviewed and approved this project.

Further information and contact details:

If you have any questions, please email me at howard.r.dobson@mmu.ac.uk or my PhD supervisor at amna.khan@mmu.ac.uk

Independent Advice

If you would like to talk to someone independent from the research team, please contact; the Faculty of Business and Law Ethics Committee FOBLEthicsEnquiries@mmu.ac.uk.

The University's Data Protection Officer can be contacted at legal@mmu.ac.uk.

You also have a right to lodge a complaint in respect of the processing of your personal data with the Information Commissioner's Office as the supervisory authority. Please see https://ico.org.uk/global/contact-us/

Press the arrow button to continue.

Howard Dobson

August 2021

Consent

1 I confirm that I have read and understand the participant information sheet on the previous page. ☐

2 I understand that my participation is voluntary and that I am free to withdraw from the study by exiting the questionnaire, without my legal rights being affected. If I withdraw from the study, I understand you will not keep the data you have already collected ☐

3 I agree to participate in the project to the extent of the activities described to me in the above participant information sheet on the preceding page. ☐

4 I give permission for a fully anonymised version of the data I provide to be deposited in an Open Access repository so that it can be used for future research and learning. ☐

¬Questionnaire

The NHS website recommends that adults 19 to 64 should do at least 150 minutes of moderate intensity activity a week or 75 minutes of vigorous intensity activity per

week It doesn’t have to be in one session. You can mix moderate and vigorous activities.

Please answer the following questions about exercise:

How many minutes of moderate exercise do you currently do per week on average?

(Moderate activity is brisk walking, water aerobics, riding a bike, dancing, doubles tennis, hiking, rollerblading)

How many minutes of vigorous activity do you currently do per week on average?

(Vigorous activity is jogging or running, swimming fast, riding a bike fast or on hills, sports like football or netball, gymnastics or martial arts)

Are you aged 19-64?

Yes

No

Prefer not to say

What is your age?

(leave blank if you do not wish to give your exact age)

The following questions focus on your attitude to physical exercise. The horizontal scales move from one extreme to the other, from left to right. Choose the appropriate value or each question. Try to answer each question honestly.

Thinking about the next seven days ahead, please answer the following questions:

(The horizontal scales move from one extreme to the other, from left to right. Choose the appropriate value or each question. Try to answer each question honestly.)

Exercising over the next seven days would be (1=very harmful, 7=very beneficial)

Very foolish (1) to very wise (7)

Exercising over the next seven days would be (1=very foolish, 7=very wise)

Exercising over the next seven days would be (1=very unpleasant, 7=very pleasant)

Exercising over the next seven days would be (1=very unenjoyable, 7=very enjoyable)

How certain do you feel in your attitude toward physical exercise? (1=not certain, 9=extremely certain)

To what extent to you agree with the following three statements? (1=strongly disagree, 7=strongly agree)

It is likely that I will exercise over the next seven days

I plan on exercising over the next seven days

I am contemplating exercising over the next seven days

(Respondent sees one of the following four promotional messages - selected at random)

Before answering the next questions, please read the short marketing message on the following page

Press the arrow button to continue

(COGNITIVE POSITIVE)

MARKETING MESSAGE - PHYSICAL EXERCISE

Physical exercise is free, easy to take and has an immediate effect on your health.

It's medically proven that people who do regular physical activity have:

up to a 35% lower risk of coronary heart disease and stroke

up to a 50% lower risk of type 2 diabetes

up to a 50% lower risk of colon cancer

up to a 20% lower risk of breast cancer

a 30% lower risk of early death

up to an 83% lower risk of osteoarthritis

up to a 68% lower risk of hip fracture

a 30% lower risk of falls (among older adults)

up to a 30% lower risk of depression

up to a 30% lower risk of dementia

Given the overwhelming evidence, it seems obvious that we should all be physically active. It's essential if you want to live a healthy and fulfilling life into old age.

Press the arrow button to continue

(COGNITIVE NEGATIVE)

MARKETING MESSAGE - PHYSICAL EXERCISE

Inactivity is described by the Department of Health as a "silent killer". Evidence is emerging that sedentary behaviour, such as sitting or lying down for long periods, is bad for your health.

Research suggests that many adults spend more than 7 hours a day sitting down, at work, on transport or in their leisure time.

Common examples of sedentary behaviour include watching TV, using a computer, using the car for short journeys and sitting down to read, talk or listen to music. This type of behaviour is thought to increase your risk of developing many chronic diseases, such as heart disease, stroke and type 2 diabetes, as well as weight gain and obesity.

Exercise is the miracle cure we've always had, but for too long we've neglected to take our recommended dose. Our health is now suffering as a consequence.

Click the arrow button to continue

(AFFECTIVE POSITIVE)

MARKETING MESSAGE - PHYSICAL EXERCISE

Exercise and physical activity can provide something worthwhile in your life! Something that you really enjoy! That gives you a goal to aim for and a sense of purpose!

Did you know that physical exercise:

improves sleep

improves self esteem

improves mood

provides a focus in life

provides a sense of achievement

reduces anger or frustration

improves motivation

improves social skills

reduces tension, stress and mental fatigue

Research suggests that people who exercise regularly are less likely to suffer from depression.

Here are comments from people who have taken up exercise:

“Exercise has improved my motivation, it adds structure to my days and I feel better about myself after an exercise session.”

“When feeling depressed the gym helps brighten my mood, gives motivation to get out the house.”

“Exercise makes me feel better in myself, makes me happy.”

Click the arrow button to continue

(AFFECTIVE NEGATIVE)

MARKETING MESSAGE - PHYSICAL EXERCISE

A lack of exercise and physical activity can have a negative effect on your life.

It can:

Lead to less sleep

Lower self esteem

Lower mood

Take away a focus in life

Give you a lower sense of achievement

Lead to more anger and frustration

Decrease motivation

Lower social skills

Increase tension, stress and mental fatigue

Research suggests that people who do not exercise regularly are more likely to suffer from depression.

Press the arrow button to continue

Text for messages taken from:

Cognitive: https://www.nhs.uk/live-well/exercise/exercise-health-benefits/#:~:text=It%27s%20the%20miracle%20cure%20we,a%20GP%20to%20get%20some.

Affective: https://www.cntw.nhs.uk/content/uploads/2016/08/Benefits-of-exercise-and-mental-health.pdf

Thinking about the marketing message, how did it make you feel?

Please choose the best response for your feelings for the emotions listed

(0=none of this feeling, 6=a lot of this feeling)

Did you feel...

Happy?

Elated?

Cheerful?

Sad?

Dreary?

Dismal?

Fearful?

Afraid?

Scared?

Angry?

Irritated?

Annoyed?

Grateful?

Thankful?

Appreciative?

Guilty?

Ashamed?

Please say to what extent you agree or disagree with the following statements about the marketing message (1=strongly disagree, 7=strongly agree)

While reading the message I was:

Attempting to analyse the issues in the message

Not very attentive to the ideas

Deep in thought about the message

Unconcerned with the ideas

Extending a good deal of mental effort

Distracted by other thoughts not related to the message

Not really exerting my mind

Doing my best to think about what was written

Reflecting on the implications of the arguments

Resting my mind

Searching my mind in response to the ideas

Taking it easy

The information presented in the marketing message was (1=difficult to understand, 5=easy to understand)

The information presented in the marketing message was (1=difficult to process, 5=easy to process)

Before answering the next questions, please take another look at the same marketing message

Press the arrow button to continue

[Same marketing message appears]

Did the message content seem to be more emotional or more rational in tone? (1=more emotional, 7=more rational)

Did the message content seem to be more negative or more positive in tone? (1=more negative, 7=more positive)

Having read the marketing message again, please answer the following questions again about your attitude to physical exercise

Exercising over the next seven days would be (1=very harmful, 7=very beneficial)

Exercising over the next seven days would be (1=very foolish, 7=very wise)

Exercising over the next seven days would be (1=very unpleasant, 7=very pleasant)

Exercising over the next seven days would be (1=very unpleasant, 7=very pleasant)

How certain do you now feel in your attitude toward physical exercise? (1=not certain, 9=extremely certain)

How many minutes of vigorous exercise do you plan to do over the next seven days?

(Vigorous activity is jogging or running, swimming fast, riding a bike fast or on hills, sports like football or netball, gymnastics or martial arts)

How many minutes of moderate exercise do you plan to do over the next seven days?

(Moderate activity is brisk walking, water aerobics, riding a bike, dancing, doubles tennis, hiking, rollerblading)

To what extent to you now agree with the following three statements?
(1=strongly disagree, 7=strongly agree)

It is likely that I will exercise over the next seven days

I plan on exercising over the next seven days

I am contemplating exercising over the next seven days

Please give your response to a few statements about physical exercise

Doing physical exercise is likely to help me lead a healthier and happier life

(1=unlikely, 7=likely)

I am confident I can participate in regular exercise when:

I am tired (1=not confident, 5=extremely confident)

I am in a bad mood (1=not confident, 5=extremely confident)

I feel I don’t have time (1=not confident, 5=extremely confident)

I am on holiday (1=not confident, 5=extremely confident)

It is raining or snowing (1=not confident, 5=extremely confident)

People close to me think I should participate in regular physical activity
(1=strongly disagree, 7=strongly agree)

People who are important to me think that I should participate in regular physical activity (1=strongly disagree, 7=strongly agree)

The next short section is about the Bedfordshire, Luton and Milton Keynes (BLMK) integrated care system. The BLMK consists of NHS organisations, local councils and others from across the region that work together to ensure almost a million people get the health services, healthcare information and support they need to live healthy lives for as long as possible.

The organisations in the BLMK include:

• NHS: Bedfordshire Community Services (part of Cambridgeshire Community NHS Trust), Bedford Hospital, Luton & Dunstable University Hospital, Milton Keynes University Hospital)

• NHS ambulance trusts: East of England and South Central

• NHS Clinical Commissioning Groups: Bedfordshire, Luton

• Local councils: Central Bedfordshire Council, Luton Borough Council, Bedford Borough Council

Please answer the following questions about the BLMK.

(The horizontal scales move from one extreme to the other, from left to right. Choose the appropriate value or each question. Try to answer each question honestly.)

The organisations in the BLMK, and people like me, are attentive to what each other say (1=strongly disagree, 9=strongly agree)

The organisations in the BLMK believe the opinions of people like me are legitimate (1=strongly disagree, 9=strongly agree)

In dealing with people like me, the organisations in the BLMK have a tendency to throw their weight around (reversed question) (1=strongly disagree, 9=strongly agree)

The organisations in the BLMK really listen to what people like me have to say

(1=strongly disagree, 9=strongly agree)

I feel very confident about the skills of the organisations in the BLMK (1=strongly disagree, 9=strongly agree)

The organisations in the BLMK have the ability to accomplish what they say they will do (1=strongly disagree, 9=strongly agree)

The organisations in the BLMK treat people like me fairly and justly (1=strongly disagree, 9=strongly agree)

Whenever the organisations in the BLMK make an important decision, I know they will be concerned about people like me (1=strongly disagree, 9=strongly agree)

The organisations in the BLMK can be relied on to keep their promises (1=strongly disagree, 9=strongly agree)

I believe that the organisations in the BLMK take the opinions of people like me into account when making decisions (1=strongly disagree, 9=strongly agree)

The organisations in the BLMK and I have a strong relationship. We freely share our ideas, feelings and hopes (1=strongly disagree, 7=strongly agree)

I can talk freely to the organisations in the BLMK about difficulties I am having and know that they will want to listen (1=strongly disagree, 7=strongly agree)

I would feel a sense of loss if I was no longer able to have a relationship with the organisations in the BLMK (1=strongly disagree, 7=strongly agree)

If I shared my problems with the organisations in the BLMK, I know they would respond constructively and caringly (1=strongly disagree, 7=strongly agree)

I would have to say that the organisations in the BLMK and I have made considerable investments in our relationship (1=strongly disagree, 7=strongly agree)

And finally - please answer the following general questions

What is your gender?

Male

Female

Other

Prefer not to say

Where do you live?

Bedfordshire, UK (Central Bedfordshire, Luton or Bedford)

Elsewhere

Do you work for the NHS?

Yes

No

By pressing submit you agree to taking part in this research. If you do not press submit, your data will be deleted from the study.

We thank you for your time spent taking this survey. Your responses have been recorded.

Appendix 6: Variables and indicators

Clustering variables and other variables

Latent variable / observed variable name	Indicator abbreviations	Categories in scale	Source of scale	Questionnaire items
Initial cognitive attitude (ICA)	ICA1 ICA2	7	Conner and Norman (2021) / Crites, Fabrigar and Petty (1994)	Exercising over the next week would be: Very harmful (1) to very beneficial (7) Very foolish (1) to very wise (7)
Initial affective attitude (IAA)	IAA1 IAA2	7		Exercising over the next week would be: Very unpleasant (1) very pleasant (7) Very unenjoyable (1) to very enjoyable (7)
Attitude certainty (ACR)	ACR	9	Clarkson, Tormala and Rucker (2011)	How certain do you feel in your attitude toward physical exercise? (1=not certain, 9=extremely certain)
New attitude certainty (NCT)	NCT	9		How certain do you now feel in your attitude toward physical exercise? (1=not certain, 9=extremely certain)
Elaboration likelihood (ELM)	ELM1 ELM2 ELM3 ELM4 ELM5 ELM6 ELM7 ELM8 ELM9 ELM10 ELM11 ELM12	7	Reynolds (1997)	While reading the message I was: 1) Attempting to analyse the issues in the message 2) Not very attentive to the ideas 3) Deep in thought about the message 4) Unconcerned with the ideas 5) Extending a good deal of mental effort 6) Distracted by other thoughts not related to the message 7) Not really exerting my mind 8) Doing my best to think about what was written 9) Reflecting on the implications of the arguments 10) Resting my mind 11) Searching my mind in response to the ideas 12) Taking it easy (1=disagree, 7=agree)

Processing Fluency (FAM)	FAM1 FAM2	5	Ryffel and Wirth (2016)	The information presented was (1=easy to understand, 5=difficult to understand) The information presented was (1=easy to process, 5=difficult to process)
Positive / negative (PON)	Not applicable	7	Not applicable	Did the message content seem to be more positive or more negative in tone?
Emotional / rational (EMR)	Not applicable	7	Not applicable	Did the message content seem to be more emotional or more rational in tone?
Location (LOC)	Not applicable	2	Not applicable	Where do you live? Bedfordshire/Elsewhere
Employment (EMP)	Not applicable	2	Not applicable	Do you work for the NHS? Yes/No
Gender (GEN)	Not applicable	4	Not applicable	Gender Please select: Male/Female/Other/Prefer not to say
Age (AGE)	Not applicable	Not applicable	Not applicable	Please enter your age
Initial vigorous exercise (BHV1)	Not applicable	Not applicable	Not applicable	How many minutes of vigorous activity do you currently do per week on average?
Initial moderate exercise (BHV2)	Not applicable	Not applicable	Not applicable	How many minutes of moderate exercise do you currently do per week on average?
New vigorous exercise (BHV3)	Not applicable	Not applicable	Not applicable	How many minutes of vigorous activity do you intend to do over the next seven days?
New moderate exercise (BHV4)	Not applicable	Not applicable	Not applicable	How many minutes of moderate exercise do you intend to do over the next seven days?

Independent and dependent variables

Latent independent variable (unobserved)	Indicator abbreviation	Categories in scale	Source of scale	Items in questionnaire
Belief (BEL)	BEL1	7	Ajzen (2019) / NHS (2018)	Doing physical exercise is likely to help me lead a healthier and happier life (1=unlikely, 7=likely)
Self-efficacy (SES)	SES1 SES2 SES3 SES4 SES5	5	Marcus, Selby, Niaura and Rossi (1992)	I am confident I can participate in regular exercise when: 1) I am tired 2) I am in a bad mood 3) I feel I don't have time 4) I am on holiday 5) It is raining or snowing (1=not confident, 5=extremely confident)
Subjective Norm (SJN)	SJN1 SJN2	7	Ajzen (2019)	1) People close to me think I should participate in regular physical activity 2) People who are important to me think that I should participate in regular physical activity (1=strongly disagree, 7=strongly agree)
Control Mutuality (CMU)	CMU1 CMU2 CMU3 CMU4	9	Hon and Grunig (1999)	1) The organisations in the BLMK and people like me are attentive to what each other say 2) The organisations in the BLMK believe the opinions of people like me are legitimate 3) In dealing with people like me, the organisations in the BLMK have a tendency to throw their weight around. (Reversed) 4) The organisations in the BLMK really listen to what people like me have to say (1=strongly disagree, 9=strongly agree)

Trust – Cognitive: competence (TCC)	TCC1 TCC2	9	Hon and Grunig (1999)	1) I feel very confident about the organisations in the BLMK's skills 2) The organisations in the BLMK have the ability to accomplish what they say they will do (1=strongly disagree, 9=strongly agree)
Trust – Cognitive: integrity (TCI)	TCI1 TCI2	9	Hon and Grunig (1999)	1) The organisations in the BLMK treat people like me fairly and justly 2) Whenever the organisations in the BLMK make an important decision, I know they will be concerned about people like me (1=strongly disagree, 9=strongly agree)
Trust – Cognitive: dependability (TCD)	TCD1 TCD2	9	Hon and Grunig (1999)	1) The organisations in the BLMK can be relied on to keep their promises 2) I believe that the organisations in the BLMK take the opinions of people like me into account when making decisions (1=strongly disagree, 9=strongly agree)
Trust – affective (TAF)	TAF1 TAF2 TAF3 TAF4 TAF5	7	McAllister (1995)	1) The organisations in the BLMK and I have a strong relationship. We freely share our ideas, feelings and hopes 2) I can talk freely to the organisations in the BLMK about difficulties I am having and know that they will want to listen 3) I would feel a sense of loss if I was no longer able to have a relationship with the organisations in the BLMK 4) If I shared my problems with the organisations in the BLMK, I know they would respond constructively and caringly 5) I would have to say that the organisations in the BLMK and I have made considerable investments in our relationship (1=strongly disagree, 7=strongly agree)

Affect: Happiness (HAP)	HAP1 HAP2 HAP3	7	Dillard and Shen (2006)	How did the message make you feel? Happiness (happy, elated, cheerful) (0=none of this feeling, 6=a lot of this feeling)
Affect: Sadness (SAD)	SAD1 SAD2 SAD3	7		Sadness (sad, dreary, dismal) (0=none of this feeling, 6=a lot of this feeling)
Affect: Fear (FER)	FER1 FER2 FER3	7		Fear (fearful, afraid, scared) (0=none of this feeling, 6=a lot of this feeling)
Affect: Anger (ANG)	ANG1 ANG2 ANG3	7		Anger (angry, irritated, annoyed) (0=none of this feeling, 6=a lot of this feeling)
Affect: Guilt (GLT)	GLT1 GLT2	7		Guilt (guilty, ashamed) (0=none of this feeling, 6=a lot of this feeling)
Affect: Gratitude (GRA)	GRA1 GRA2 GRA3	7	McCullough, Emmons and Tsang (2002)	Gratitude (grateful, thankful, appreciative) (0=none of this feeling, 6=a lot of this feeling)
New cognitive attitude (NAC)	NAC1 NAC2	7	Conner and Norman (2021) / Crites, Fabrigar and Petty (1994)	Exercising over the next week would be: Very harmful (1) to very beneficial (7) Very foolish (1) to very wise (7)
New affective attitude (NAA)	NAC1 NAC2	7		Exercising over the next week would be: Very unpleasant (1) very pleasant (7) Very unenjoyable (1) to very enjoyable (7)
Initial behavioural intention (IBI)	IBI1 IBI2 IBI3	7	Van ‘t Riet et al. (2014)	1) It is likely that I will exercise over the next seven days 2) I plan on exercising over the next seven days 3) I am contemplating exercising over the next seven days (1=strongly disagree, 7=strongly agree)
New behavioural intention (NBI)	NBI1 NBI2 NBI3	7		1) It is likely that I will exercise over the next seven days 2) I plan on exercising over the next seven days 3) I am contemplating exercising over the next seven days (1=strongly disagree, 7=strongly agree)

Appendix 7: Social media advert

Appendix 8: Sample distribution profile

Variable	Mean	Median	Min	Max	Standard Deviation
Age	45.64	47.00	19.00	66.00	11.79
Vigorous exercise pre-message	85.57	60.00	0.00	1000.00	110.95
Moderate exercise pre-message	179.06	120.00	0.00	3000.00	243.97
Vigorous exercise post-message	94.10	60.00	0.00	1000.00	113.94
Moderate exercise post-message	197.39	150.00	0.00	3000.00	253.65

Gender	Male	Female	Other	Prefer not to say	Total
	173	613	5	2	793
	22%	77%	1%	0%	100%

Employment (works for NHS)	Yes	No	Total
	61	732	793
	8%	92%	100%

Location	Beds	Other	Total
	776	17	793
	98%	2%	100%

Appendix 9: Descriptive statistics

Variable	Mean	Median	Min	Max	Standard Deviation	Kurtosis	Skewness
BHV2	85.57	60.00	0.00	1000.00	110.95	9.92	2.39
BHV1	179.06	120.00	0.00	3000.00	243.97	~~46.30~~	~~5.55~~
AGE	45.64	47.00	19.00	66.00	11.79	~~-0.77~~	~~-0.42~~
ICA1	6.55	7.00	2.00	7.00	0.94	~~6.33~~	~~-2.47~~
ICA2	6.59	7.00	1.00	7.00	0.89	~~8.90~~	~~-2.78~~
IAA1	5.29	5.00	1.00	7.00	1.50	~~-0.02~~	~~-0.70~~
IAA2	5.39	6.00	1.00	7.00	1.53	~~0.08~~	~~-0.81~~
ACR	7.20	8.00	1.00	9.00	2.03	0.27	-1.04
IBI1	6.02	7.00	1.00	7.00	1.71	1.74	-1.70
IBI2	6.04	7.00	1.00	7.00	1.74	1.93	-1.78
IBI3	5.89	7.00	1.00	7.00	1.88	1.25	-1.60
HAP1	4.22	4.00	1.00	7.00	1.93	-0.93	-0.27
HAP2	3.36	4.00	1.00	7.00	1.87	-0.97	0.21
HAP3	3.89	4.00	1.00	7.00	1.95	-1.09	-0.07
SAD1	2.86	2.00	1.00	7.00	1.89	-1.00	0.55
SAD2	2.54	2.00	1.00	7.00	1.78	-0.61	0.79
SAD3	2.40	1.00	1.00	7.00	1.74	-0.51	0.89
FER1	2.50	1.00	1.00	7.00	1.91	-0.39	0.96

FER2	2.32	1.00	1.00	7.00	1.81	-0.08	1.10
FER3	2.21	1.00	1.00	7.00	1.74	0.25	1.22
ANG1	1.89	1.00	1.00	7.00	1.51	2.18	1.73
ANG2	2.17	1.00	1.00	7.00	1.68	0.50	1.28
ANG3	2.10	1.00	1.00	7.00	1.66	0.87	1.40
GRA1	3.62	4.00	1.00	7.00	2.09	-1.28	0.09
GRA2	3.69	4.00	1.00	7.00	2.14	-1.35	0.04
GRA3	3.82	4.00	1.00	7.00	2.15	-1.34	-0.02
GLT1	2.89	2.00	1.00	7.00	2.11	-1.00	0.67
GLT2	2.41	1.00	1.00	7.00	1.93	-0.15	1.10
ELM1	4.22	4.00	1.00	7.00	1.64	-0.19	-0.30
ELM2	4.42	4.00	1.00	7.00	1.69	-0.84	-0.04
ELM3	3.60	4.00	1.00	7.00	1.55	-0.57	-0.08
ELM4	4.83	5.00	1.00	7.00	1.62	-0.52	-0.38
ELM5	3.07	3.00	1.00	7.00	1.59	-0.80	0.21
ELM6	4.49	4.00	1.00	7.00	1.80	-1.04	-0.06
ELM7	3.84	4.00	1.00	7.00	1.66	-0.51	0.32
ELM8	4.33	4.00	1.00	7.00	1.60	-0.39	-0.35
ELM9	4.27	4.00	1.00	7.00	1.59	-0.35	-0.34
ELM10	3.84	4.00	1.00	7.00	1.52	-0.38	-0.13

ELM11	4.63	4.00	1.00	7.00	1.44	-0.27	0.01
ELM12	4.11	4.00	1.00	7.00	1.51	-0.16	0.25
FAM1	4.52	5.00	2.00	5.00	0.78	0.91	-1.42
FAM2	4.37	5.00	1.00	5.00	0.90	0.48	-1.23
EMR	4.43	4.00	1.00	7.00	1.62	-0.34	-0.15
PON	4.33	4.00	1.00	7.00	1.69	-0.48	-0.11
NAC1	6.63	7.00	2.00	7.00	0.89	9.78	-3.01
NAC2	6.62	7.00	2.00	7.00	0.87	9.36	-2.91
NAA1	5.48	6.00	1.00	7.00	1.48	0.10	-0.85
NAA2	5.45	6.00	1.00	7.00	1.55	0.15	-0.90
NCT	7.67	9.00	1.00	9.00	1.83	1.24	-1.40
BHV4	94.10	60.00	0.00	1000.00	113.94	~~9.14~~	~~2.33~~
BHV3	197.39	150.00	0.00	3000.00	253.65	~~39.10~~	~~5.08~~
NBI1	6.38	7.00	1.00	7.00	1.25	5.79	-2.43
NBI2	6.38	7.00	1.00	7.00	1.31	6.01	-2.51
NBI3	6.09	7.00	1.00	7.00	1.69	2.52	-1.91
BEL1	6.64	7.00	2.00	7.00	0.80	6.89	-2.55
SES1	3.03	3.00	1.00	5.00	1.38	-1.23	-0.08
SES2	3.63	4.00	1.00	5.00	1.34	-0.77	-0.65
SES3	2.77	3.00	1.00	5.00	1.32	-1.09	0.20

SES4	3.19	3.00	1.00	5.00	1.41	-1.24	-0.20
SES5	3.39	4.00	1.00	5.00	1.36	-0.96	-0.47
SJN1	5.03	5.00	1.00	7.00	1.90	-0.62	-0.67
SJN2	5.15	6.00	1.00	7.00	1.86	-0.44	-0.78
CMU1	4.63	5.00	1.00	9.00	1.91	0.02	0.12
CMU2	4.75	5.00	1.00	9.00	1.97	-0.26	0.09
CMU3	5.63	5.00	1.00	9.00	1.92	0.04	-0.22
CMU4	4.25	4.00	1.00	9.00	1.86	0.14	0.27
TCC1	4.94	5.00	1.00	9.00	1.98	-0.34	0.07
TCC2	4.56	5.00	1.00	9.00	1.80	-0.04	0.09
TCI1	4.97	5.00	1.00	9.00	1.87	-0.05	0.03
TCI2	4.45	5.00	1.00	9.00	1.89	-0.15	0.15
TCD1	4.29	4.00	1.00	9.00	1.74	0.23	0.19
TCD2	4.24	4.00	1.00	9.00	1.88	-0.02	0.22
TAF1	2.88	3.00	1.00	7.00	1.60	-0.79	0.37
TAF2	3.28	4.00	1.00	7.00	1.52	-0.61	0.08
TAF3	3.09	3.00	1.00	7.00	1.74	-0.78	0.34
TAF4	3.53	4.00	1.00	7.00	1.49	-0.34	0.03
TAF5	2.82	3.00	1.00	7.00	1.52	-0.46	0.43

Appendix 10: t-test results

Cognitive/affective messaging

	Affective	*Cognitive*
Mean	4.30	4.56
Variance	2.95	2.28
Observations	407	386
Hypothesized Mean Difference	0	
df	787	
t Stat	-2.22	
P(T<=t) one-tail	0.01	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.03	
t Critical two-tail	1.96	

Table 1a: Manipulation check for cognitive/affective messaging. Results of t-test (two-sample assuming unequal variances)

Positive/negative messaging

	Negative	*Positive*
Mean	3.55	5.11
Variance	2.34	2.16
Observations	396	397
Hypothesized Mean Difference	0	
df	789	
t Stat	-14.58	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.00	
t Critical two-tail	1.96	

Table 1b: Manipulation checks for positive/negative messaging. Results of t-test (two-sample assuming unequal variances)

Elaboration likelihood		
	High	*Low*
Mean	4.84	3.37
Variance	0.40	0.37
Observations	415	378
Hypothesized Mean Difference	0	
df	789	
t Stat	33.31	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.00	
t Critical two-tail	1.96	

Table 1c: Results of t-tests for ELM for full dataset (two-sample assuming unequal variances)

Attitude certainty		
	High	*Low*
Mean	8.74	5.38
Variance	0.19	2.63
Observations	429	364
Hypothesized Mean Difference	0	
df	409	
t Stat	38.30	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.00	
t Critical two-tail	1.97	

Table 1d: Results of t-tests for attitude certainty for full dataset (two-sample assuming unequal variances)

Processing fluency		
	High attitude certainty	*Low attitude certainty*
Mean	4.54	4.33
Variance	0.51	0.74
Observations	429	364
Hypothesized Mean Difference	0	
df	708	
t Stat	3.81	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.00	
t Critical two-tail	1.96	

Table 1e: Results of t-test for processing fluency (two-sample assuming unequal variances)

Affective negative message (group 2)	*Initial attitude certainty*	*New attitude certainty*
Mean	7.31	7.61
Variance	3.49	3.33
Observations	196	196
Pearson Correlation	0.77	
Hypothesized Mean Difference	0	
df	195	
t Stat	-3.39	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.00	
t Critical two-tail	1.97	

Affective positive message (group 3)	*Initial attitude certainty*	*New attitude certainty*
Mean	7.38	7.79
Variance	4.15	3.41
Observations	211	211
Pearson Correlation	0.74	
Hypothesized Mean Difference	0	
df	210	
t Stat	-4.20	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.00	
t Critical two-tail	1.97	

Table 1f: Results of t-tests for difference between initial attitude certainty and new attitude certainty groups 2 to 5 (paired two sample for means)

Cognitive negative message (group 4)	*Initial attitude certainty*	*New attitude certainty*
Mean	6.86	7.51
Variance	4.88	3.52
Observations	200	200
Pearson Correlation	0.74	
Hypothesized Mean Difference	0	
df	199	
t Stat	-6.01	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.00	
t Critical two-tail	1.97	

Cognitive positive message (group 5)	*Initial attitude certainty*	*New attitude certainty*
Mean	7.24	7.77
Variance	3.77	3.05
Observations	186	186
Pearson Correlation	0.71	
Hypothesized Mean Difference	0	
df	185	
t Stat	-5.12	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.65	
P(T<=t) two-tail	0.00	
t Critical two-tail	1.97	

Affective negative message (group 6)	*Initial attitude certainty*	*New attitude certainty*
Mean	5.38	6.23
Variance	2.63	3.14
Observations	47	47
Pearson Correlation	0.74	
Hypothesized Mean Difference	0	
df	46	
t Stat	-4.73	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.68	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.01	

Affective positive message (group 7)	*Initial attitude certainty*	*New attitude certainty*
Mean	5.19	6.19
Variance	2.48	3.64
Observations	32	32
Pearson Correlation	0.46	
Hypothesized Mean Difference	0	
df	31	
t Stat	-3.09	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.70	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.04	

Cognitive negative message (group 8)	*Initial attitude certainty*	*New attitude certainty*
Mean	5.20	6.69
Variance	2.79	3.01
Observations	59	59
Pearson Correlation	0.53	
Hypothesized Mean Difference	0	
df	58	
t Stat	-6.92	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.67	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.00	

Cognitive positive message (group 9)	*Initial attitude certainty*	*New attitude certainty*
Mean	5.69	6.67
Variance	2.72	2.35
Observations	49	49
Pearson Correlation	0.40	
Hypothesized Mean Difference	0	
df	48	
t Stat	-3.92	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.68	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.01	

Cluster 1

Table 1g: Results of t-tests for difference between initial attitude certainty and new attitude certainty groups 6 to 9 in cluster 1 (paired two sample for means)

Affective negative message (group 10)	*Initial attitude certainty*	*New attitude certainty*
Mean	8.70	8.63
Variance	0.21	0.78
Observations	60	60
Pearson Correlation	0.56	
Hypothesized Mean Difference	0	
df	59	
t Stat	0.70	
P(T<=t) one-tail	0.24	
t Critical one-tail	1.67	
P(T<=t) two-tail	0.48	
t Critical two-tail	2.00	

Affective positive message (group 11)	*Initial attitude certainty*	*New attitude certainty*
Mean	8.76	8.81
Variance	0.19	0.30
Observations	54	54
Pearson Correlation	0.60	
Hypothesized Mean Difference	0	
df	53	
t Stat	-0.90	
P(T<=t) one-tail	0.19	
t Critical one-tail	1.67	
P(T<=t) two-tail	0.37	
t Critical two-tail	2.01	

Cognitive negative message (group 12)	*Initial attitude certainty*	*New attitude certainty*
Mean	8.70	8.64
Variance	0.22	0.67
Observations	56	56
Pearson Correlation	0.33	
Hypothesized Mean Difference	0	
df	55	
t Stat	0.50	
P(T<=t) one-tail	0.31	
t Critical one-tail	1.67	
P(T<=t) two-tail	0.62	
t Critical two-tail	2.00	

Cognitive positive message (group 13)	*Initial attitude certainty*	*New attitude certainty*
Mean	8.69	8.67
Variance	0.22	1.07
Observations	58	58
Pearson Correlation	0.37	
Hypothesized Mean Difference	0	
df	57	
t Stat	0.14	
P(T<=t) one-tail	0.45	
t Critical one-tail	1.67	
P(T<=t) two-tail	0.89	
t Critical two-tail	2.00	

Cluster 2

Table 1h: Results of t-tests for difference between initial attitude certainty and new attitude certainty groups 10 to 13 in cluster 2 (paired two sample for means)

Affective negative message (group 14)	*Initial attitude certainty*	*New attitude certainty*
Mean	5.66	6.42
Variance	1.26	4.63
Observations	38	38
Pearson Correlation	0.45	
Hypothesized Mean Difference	0	
df	37	
t Stat	-2.45	
P(T<=t) one-tail	0.01	
t Critical one-tail	1.69	
P(T<=t) two-tail	0.02	
t Critical two-tail	2.03	

Affective positive message (group 15)	*Initial attitude certainty*	*New attitude certainty*
Mean	5.40	6.51
Variance	3.21	5.10
Observations	53	53
Pearson Correlation	0.54	
Hypothesized Mean Difference	0	
df	52	
t Stat	-4.08	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.67	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.01	

Cluster 3

Table 1i: Results of t-tests for difference between initial attitude certainty and new attitude certainty groups 14 to 17 in cluster 3 (paired two sample for means)

Cognitive negative message (group 16)	*Initial attitude certainty*	*New attitude certainty*
Mean	5.13	6.21
Variance	3.24	4.91
Observations	47	47
Pearson Correlation	0.64	
Hypothesized Mean Difference	0	
df	46	
t Stat	-4.27	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.68	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.01	

Cognitive positive message (group 17)	*Initial attitude certainty*	*New attitude certainty*
Mean	5.44	6.64
Variance	2.30	4.76
Observations	39	39
Pearson Correlation	0.60	
Hypothesized Mean Difference	0	
df	38	
t Stat	-4.30	
P(T<=t) one-tail	0.00	
t Critical one-tail	1.69	
P(T<=t) two-tail	0.00	
t Critical two-tail	2.02	

Affective negative message (group 18)	*Initial attitude certainty*	*New attitude certainty*
Mean	8.67	8.57
Variance	0.23	0.69
Observations	51	51
Pearson Correlation	0.29	
Hypothesized Mean Difference	0	
df	50	
t Stat	0.84	
P(T<=t) one-tail	0.20	
t Critical one-tail	1.68	
P(T<=t) two-tail	0.40	
t Critical two-tail	2.01	

Affective positive message (group 19)	*Initial attitude certainty*	*New attitude certainty*
Mean	8.78	8.67
Variance	0.18	0.56
Observations	72	72
Pearson Correlation	0.43	
Hypothesized Mean Difference	0	
df	71	
t Stat	1.38	
P(T<=t) one-tail	0.09	
t Critical one-tail	1.67	
P(T<=t) two-tail	0.17	
t Critical two-tail	1.99	

Cognitive negative message (group 20)	*Initial attitude certainty*	*New attitude certainty*
Mean	8.87	8.68
Variance	0.12	0.55
Observations	38	38
Pearson Correlation	0.26	
Hypothesized Mean Difference	0	
df	37	
t Stat	1.56	
P(T<=t) one-tail	0.06	
t Critical one-tail	1.69	
P(T<=t) two-tail	0.13	
t Critical two-tail	2.03	

Cognitive positive message (group 21)	*Initial attitude certainty*	*New attitude certainty*
Mean	8.78	8.90
Variance	0.18	0.09
Observations	40	40
Pearson Correlation	0.62	
Hypothesized Mean Difference	0	
df	39	
t Stat	-2.36	
P(T<=t) one-tail	0.01	
t Critical one-tail	1.68	
P(T<=t) two-tail	0.02	
t Critical two-tail	2.02	

Cluster 4

Table 1j: Results of t-tests for difference between initial attitude certainty and new attitude certainty groups 18 to 21 in cluster 4 (paired two sample for means)

Appendix 11: Discriminant validity results

	ATT	TAF	ANG	BEL	CMU	FER	GRA	GLT	HAP	IBI	NAA	NBI	NCA	SJN	SAD	SEF	TCC	TCD	TCI
ATT	0.84																		
TAF	0.11	0.82																	
ANG	-0.23	-0.13	0.93																
BEL	0.56	0.15	-0.19	1.00															
CMU	0.12	0.65	-0.15	0.17	0.91														
FER	-0.18	-0.01	0.54	-0.05	0.01	0.97													
GRA	0.33	0.23	-0.09	0.23	0.22	-0.08	0.97												
GLT	-0.28	-0.05	0.47	-0.09	-0.03	0.64	-0.15	0.96											
HAP	0.39	0.20	-0.27	0.25	0.16	-0.34	0.63	-0.32	0.94										
IBI	0.48	0.03	-0.10	0.29	0.01	-0.15	0.20	-0.32	0.29	0.89									
NAA	0.87	0.13	-0.24	0.43	0.12	-0.23	0.37	-0.41	0.45	0.47	0.98								
NBI	0.54	0.10	-0.14	0.39	0.05	-0.17	0.26	-0.30	0.32	0.75	0.50	0.87							
NCA	0.85	0.06	-0.15	0.52	0.08	-0.07	0.19	-0.06	0.22	0.36	0.48	0.43	0.97						
SJN	0.27	0.06	-0.07	0.27	0.13	-0.07	0.17	-0.04	0.22	0.15	0.23	0.18	0.22	0.97					
SAD	-0.25	-0.04	0.59	-0.11	-0.01	0.73	-0.19	0.63	-0.43	-0.21	-0.32	-0.23	-0.10	-0.09	0.91				
SEF	0.50	0.13	-0.20	0.28	0.08	-0.26	0.36	-0.47	0.41	0.47	0.56	0.47	0.28	0.22	-0.32	0.83			
TCC	0.05	0.62	-0.09	0.11	0.71	0.02	0.12	-0.01	0.09	0.01	0.04	0.04	0.05	0.11	0.00	0.04	0.93		
TCD	0.15	0.72	-0.13	0.17	0.76	-0.02	0.19	-0.06	0.14	-0.06	0.14	0.11	0.12	0.12	-0.01	0.09	0.77	0.95	
TCI	0.12	0.65	-0.15	0.18	0.75	-0.03	0.15	-0.06	0.13	0.07	0.10	0.11	0.11	0.11	-0.03	0.08	0.78	0.85	0.93

Discriminant validity: Fornell-Larcker criterion

	ATT	TAF	ANG	BEL	CMU	FER	GRA	GLT	HAP	IBI	NAA	NBI	NCA	SJN	SAD	SEF	TCI	TCD	TCI
ANG1	-0.18	-0.06	**0.87**	-0.16	-0.11	0.55	-0.04	0.41	-0.22	-0.06	-0.18	-0.09	-0.13	-0.05	0.53	-0.13	-0.06	-0.07	-0.10
ANG2	-0.23	-0.14	**0.96**	-0.18	-0.15	0.47	-0.10	0.43	-0.27	-0.11	-0.24	-0.15	-0.15	-0.06	0.56	-0.21	-0.09	-0.13	-0.15
ANG3	-0.23	-0.15	**0.96**	-0.19	-0.16	0.50	-0.10	0.46	-0.26	-0.11	-0.23	-0.15	-0.15	-0.10	0.57	-0.22	-0.11	-0.15	-0.16
BEL1	0.55	0.15	-0.19	**1.00**	0.17	-0.05	0.23	-0.09	0.25	0.29	0.43	0.39	0.52	0.27	-0.11	0.28	0.11	0.17	0.18
CMU1	0.09	0.57	-0.12	0.10	**0.90**	0.01	0.23	-0.02	0.18	0.03	0.09	0.05	0.06	0.13	-0.03	0.09	0.62	0.64	0.64
CMU2	0.12	0.57	-0.14	0.15	**0.93**	0.01	0.17	-0.02	0.13	-0.02	0.11	0.01	0.09	0.15	0.03	0.05	0.62	0.67	0.66
CMU4	0.12	0.63	-0.15	0.19	**0.91**	0.00	0.20	-0.03	0.14	0.02	0.12	0.08	0.08	0.08	-0.01	0.08	0.69	0.76	0.73
FER1	-0.17	-0.01	0.51	-0.04	0.00	**0.96**	-0.09	0.62	-0.37	-0.16	-0.23	-0.17	-0.06	-0.07	0.73	-0.26	0.02	-0.02	-0.03
FER2	-0.17	0.00	0.51	-0.06	0.00	**0.98**	-0.07	0.62	-0.32	-0.14	-0.22	-0.16	-0.07	-0.08	0.70	-0.25	0.02	-0.01	-0.03
FER3	-0.18	-0.01	0.53	-0.05	0.01	**0.97**	-0.07	0.61	-0.31	-0.15	-0.23	-0.17	-0.08	-0.07	0.69	-0.24	0.03	-0.02	-0.02
GLT1	-0.25	-0.04	0.40	-0.07	-0.01	0.60	-0.15	**0.96**	-0.31	-0.29	-0.38	-0.27	-0.03	-0.04	0.60	-0.47	0.01	-0.05	-0.04
GLT2	-0.29	-0.05	0.49	-0.10	-0.04	0.62	-0.13	**0.96**	-0.31	-0.33	-0.40	-0.31	-0.08	-0.04	0.62	-0.43	-0.03	-0.07	-0.07
GRA1	0.31	0.20	-0.08	0.22	0.19	-0.04	**0.96**	-0.11	0.58	0.18	0.35	0.24	0.17	0.17	-0.15	0.32	0.09	0.16	0.12
GRA2	0.34	0.23	-0.09	0.24	0.21	-0.09	**0.98**	-0.16	0.61	0.22	0.38	0.28	0.20	0.16	-0.19	0.37	0.11	0.19	0.15
GRA3	0.31	0.24	-0.10	0.21	0.24	-0.11	**0.96**	-0.14	0.62	0.19	0.35	0.25	0.17	0.16	-0.19	0.34	0.14	0.21	0.18
HAP1	0.38	0.15	-0.28	0.25	0.13	-0.35	0.58	-0.32	**0.95**	0.30	0.42	0.32	0.22	0.22	-0.44	0.39	0.06	0.10	0.10
HAP2	0.34	0.21	-0.21	0.21	0.17	-0.27	0.59	-0.27	**0.92**	0.24	0.40	0.26	0.18	0.18	-0.32	0.38	0.10	0.16	0.14
HAP3	0.39	0.19	-0.28	0.24	0.16	-0.35	0.59	-0.33	**0.96**	0.28	0.45	0.31	0.21	0.21	-0.44	0.40	0.10	0.15	0.13
IBI1	0.48	0.05	-0.13	0.29	0.02	-0.20	0.24	-0.39	0.33	**0.93**	0.49	0.68	0.34	0.14	-0.26	0.52	0.00	0.06	0.06
IBI2	0.46	0.02	-0.11	0.28	0.01	-0.17	0.19	-0.34	0.29	**0.95**	0.44	0.70	0.35	0.14	-0.21	0.48	-0.02	0.04	0.06
IBI3	0.34	0.02	-0.03	0.20	0.00	-0.04	0.10	-0.12	0.15	**0.78**	0.32	0.61	0.26	0.13	-0.08	0.23	0.00	0.05	0.06
NAA1	**0.85**	0.12	-0.23	0.42	0.11	-0.23	0.37	-0.39	0.44	0.45	**0.98**	0.46	0.48	0.23	-0.30	0.55	0.03	0.13	0.08
NAA2	**0.85**	0.14	-0.23	0.43	0.13	-0.23	0.36	-0.40	0.43	0.47	**0.98**	0.51	0.46	0.23	-0.32	0.56	0.06	0.15	0.11
NAC1	**0.82**	0.05	-0.16	0.50	0.08	-0.07	0.19	-0.07	0.22	0.33	0.47	0.40	**0.97**	0.21	-0.10	0.28	0.04	0.10	0.10
NAC2	**0.82**	0.06	-0.13	0.50	0.08	-0.07	0.18	-0.05	0.20	0.36	0.46	0.43	**0.97**	0.22	-0.09	0.26	0.05	0.12	0.12
NBI1	0.54	0.09	-0.13	0.38	0.06	-0.20	0.29	-0.35	0.33	0.72	0.51	**0.93**	0.42	0.15	-0.25	0.50	0.03	0.11	0.10
NBI2	0.51	0.10	-0.15	0.38	0.06	-0.17	0.25	-0.30	0.32	0.70	0.47	**0.94**	0.41	0.18	-0.21	0.45	0.05	0.12	0.12
NBI3	0.35	0.06	-0.08	0.24	0.01	-0.07	0.12	-0.10	0.16	0.53	0.30	**0.74**	0.30	0.15	-0.11	0.25	0.03	0.05	0.08
SAD1	-0.23	-0.03	0.47	-0.08	0.02	0.67	-0.15	0.58	-0.42	-0.20	-0.30	-0.19	-0.09	-0.06	**0.88**	-0.28	0.03	0.01	0.00
SAD2	-0.21	-0.05	0.56	-0.12	-0.02	0.61	-0.18	0.55	-0.38	-0.16	-0.28	-0.19	-0.07	-0.09	**0.92**	-0.29	-0.02	-0.04	-0.06
SAD3	-0.23	-0.04	0.58	-0.11	-0.01	0.71	-0.18	0.60	-0.38	-0.20	-0.28	-0.24	-0.11	-0.10	**0.93**	-0.29	-0.01	-0.01	-0.04

SES1	0.46	0.13	-0.18	0.25	0.06	-0.22	0.33	-0.41	0.36	0.41	0.52	0.42	0.26	0.17	-0.29	**0.87**	0.02	0.08	0.06
SES2	0.43	0.09	-0.17	0.23	0.04	-0.25	0.30	-0.44	0.35	0.40	0.49	0.42	0.23	0.16	-0.30	**0.85**	0.02	0.07	0.07
SES3	0.35	0.13	-0.17	0.20	0.12	-0.15	0.32	-0.35	0.34	0.29	0.41	0.30	0.18	0.18	-0.22	**0.81**	0.06	0.07	0.08
SES5	0.41	0.08	-0.15	0.24	0.03	-0.22	0.22	-0.35	0.31	0.44	0.44	0.41	0.25	0.23	-0.23	**0.78**	0.03	0.07	0.05
SJN1	0.24	0.06	-0.08	0.24	0.14	-0.08	0.16	-0.05	0.20	0.14	0.21	0.16	0.19	**0.97**	-0.09	0.20	0.11	0.12	0.12
SJN2	0.28	0.06	-0.07	0.28	0.12	-0.07	0.17	-0.03	0.22	0.16	0.24	0.20	0.24	**0.98**	-0.09	0.23	0.11	0.12	0.11
TAF1	0.10	**0.82**	-0.09	0.11	0.54	0.00	0.23	-0.05	0.19	0.00	0.12	0.05	0.04	0.03	-0.04	0.13	0.47	0.61	0.51
TAF2	0.12	**0.87**	-0.13	0.14	0.62	-0.03	0.19	-0.06	0.16	0.03	0.12	0.08	0.08	0.08	-0.04	0.12	0.57	0.67	0.62
TAF3	0.05	**0.72**	-0.05	0.09	0.36	0.03	0.17	0.01	0.14	0.05	0.06	0.09	0.02	0.05	-0.04	0.09	0.40	0.42	0.39
TAF4	0.11	**0.84**	-0.17	0.18	0.63	-0.03	0.16	-0.05	0.16	0.05	0.12	0.11	0.07	0.08	-0.04	0.08	0.61	0.68	0.65
TAF5	0.07	**0.84**	-0.07	0.07	0.47	0.01	0.21	-0.04	0.16	0.00	0.09	0.07	0.02	0.02	-0.02	0.12	0.44	0.54	0.45
TCC1	0.04	0.55	-0.10	0.11	0.65	0.03	0.09	0.00	0.05	-0.02	0.02	0.02	0.05	0.11	0.00	0.02	**0.93**	0.70	0.74
TCC2	0.06	0.60	-0.08	0.10	0.66	0.02	0.13	-0.02	0.12	0.01	0.05	0.05	0.04	0.10	-0.01	0.04	**0.93**	0.73	0.71
TCD1	0.13	0.68	-0.13	0.16	0.72	-0.03	0.19	-0.06	0.14	0.07	0.14	0.11	0.09	0.12	-0.03	0.08	0.78	**0.95**	0.82
TCD2	0.16	0.70	-0.12	0.16	0.73	0.00	0.18	-0.06	0.13	0.03	0.14	0.10	0.13	0.11	0.01	0.08	0.69	**0.95**	0.81
TCI1	0.09	0.59	-0.14	0.17	0.70	-0.01	0.12	-0.03	0.09	0.05	0.07	0.09	0.09	0.09	-0.04	0.05	0.74	0.76	**0.93**
TCI2	0.13	0.63	-0.14	0.17	0.70	-0.03	0.17	-0.08	0.16	0.07	0.11	0.12	0.12	0.13	-0.03	0.10	0.72	0.83	**0.94**

Discriminant validity: crossloadings

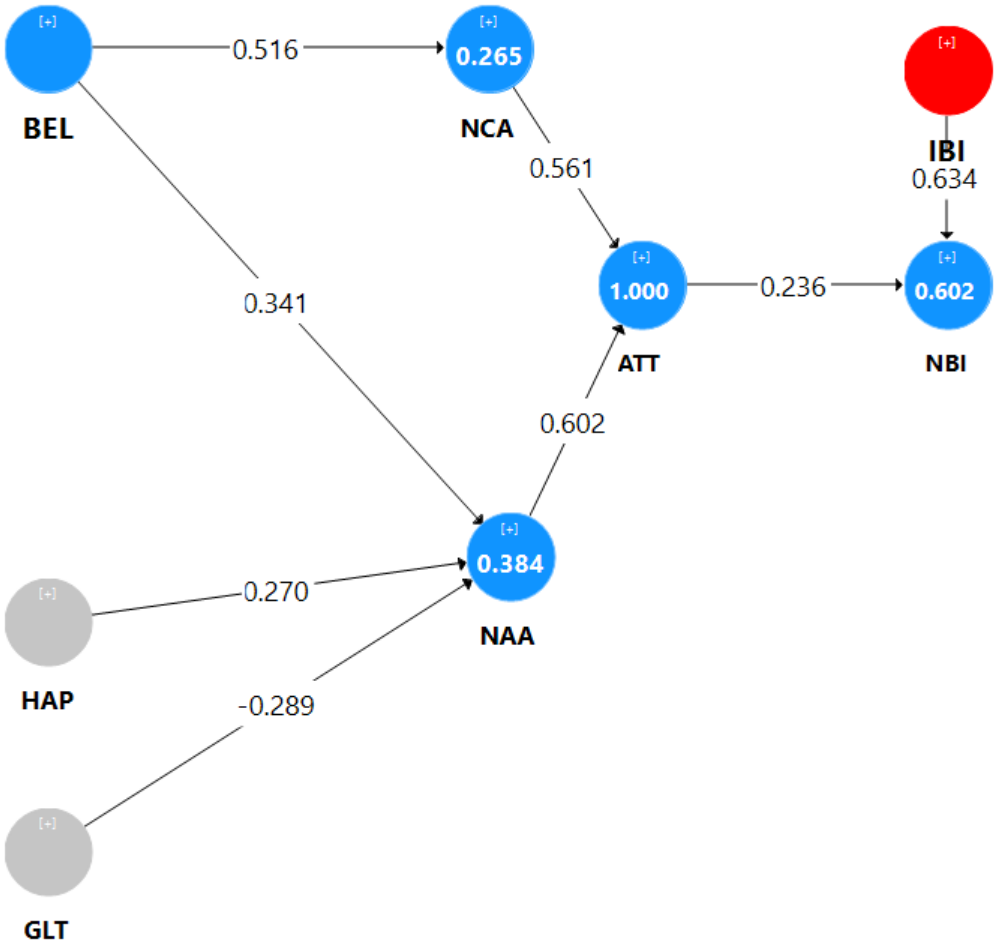
Appendix 12: Collinearity of inner reflective constructs results

	TAF	ANG	BEL	CMU	FER	GRA	GLT	HAP	NAA	ATT	NCA	SJN	SAD	SEF	TCC	TCD	TCI	NBI
Affective trust									1.086									
Anger	1.65		1.669						1.639			1.669		1.669				
Attitude																		1.535
BEL											1.168							
Control mutuality			1.097									1.097		1.097	1	1	1	
Fear	2.498		2.491						2.495			2.491		2.491				
Gratitude	1.741		1.745						1.738			1.745		1.745				
Guilt	1.906		1.9						1.9			1.9		1.9				
Happiness	2.01		2.011						2.017			2.011		2.011				
Initial behav. intention																		1.435
New affective attitude										1.297								
New behavioural intention																		
New cognitive attitude										1.297								
Subjective norm																		1.088
Sadness	2.817		2.808						2.787			2.808		2.808				
Self-efficacy																		1.476
Trust competency	2.866										2.865							
Trust dependability	4.214										4.124							
Trust integrity	4.351										4.355							

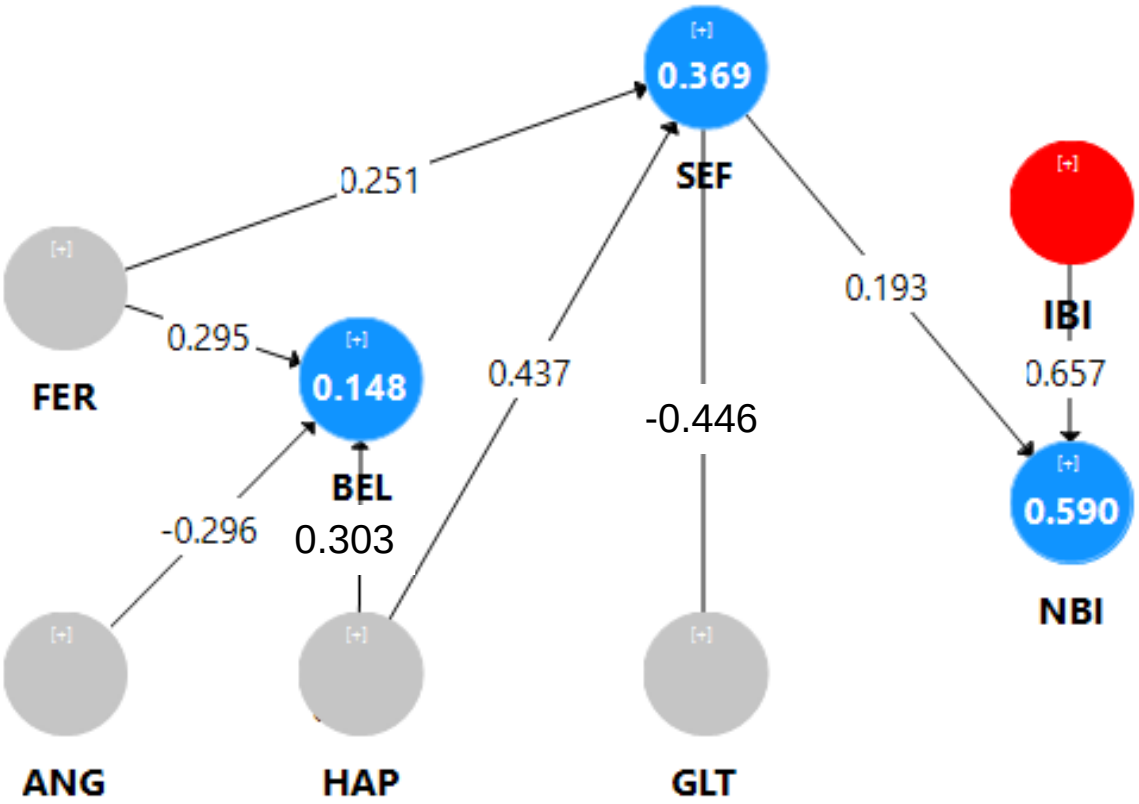
Collinearity statistics: inner VIF values for full dataset. All values are below 5 therefore there are no collinearity issues

Appendix 13: 21 path diagrams (for all data and the four clusters)

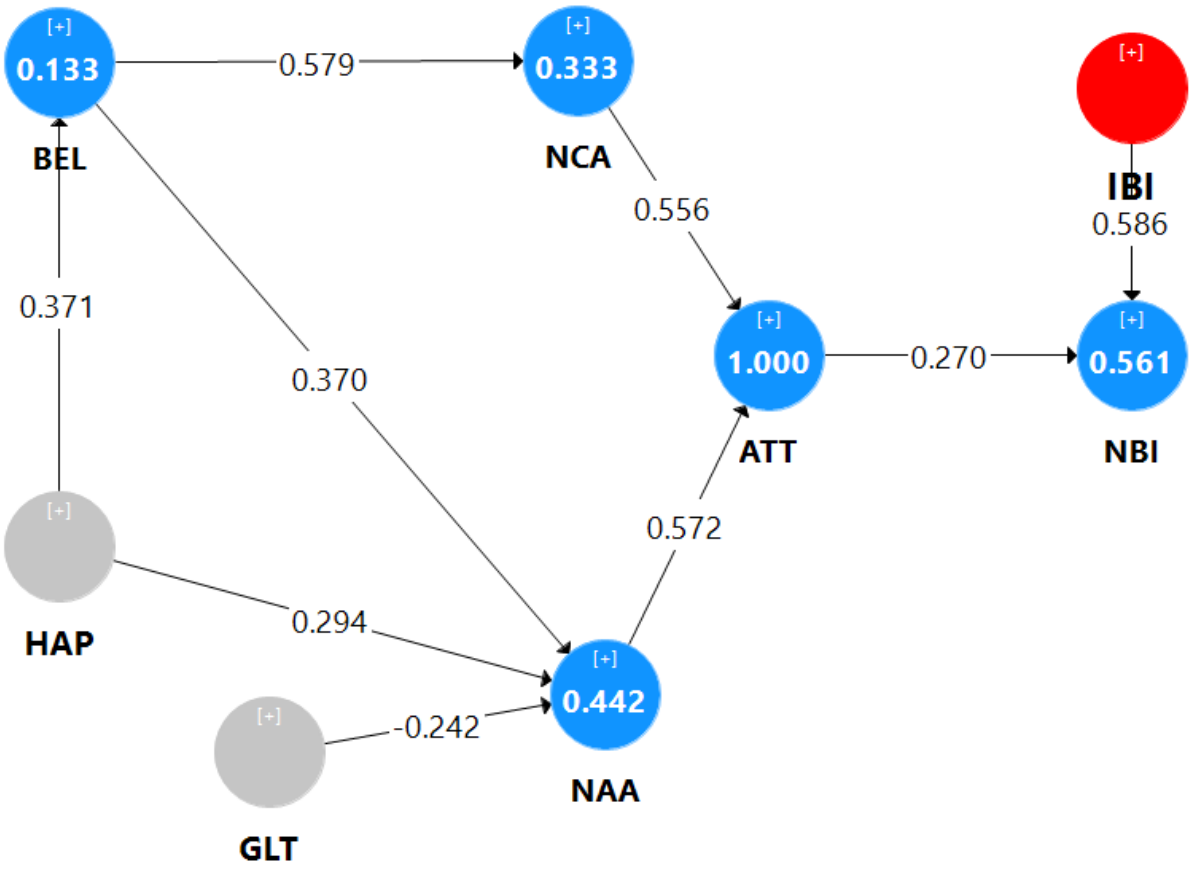
1) ALL DATA (Group 1)



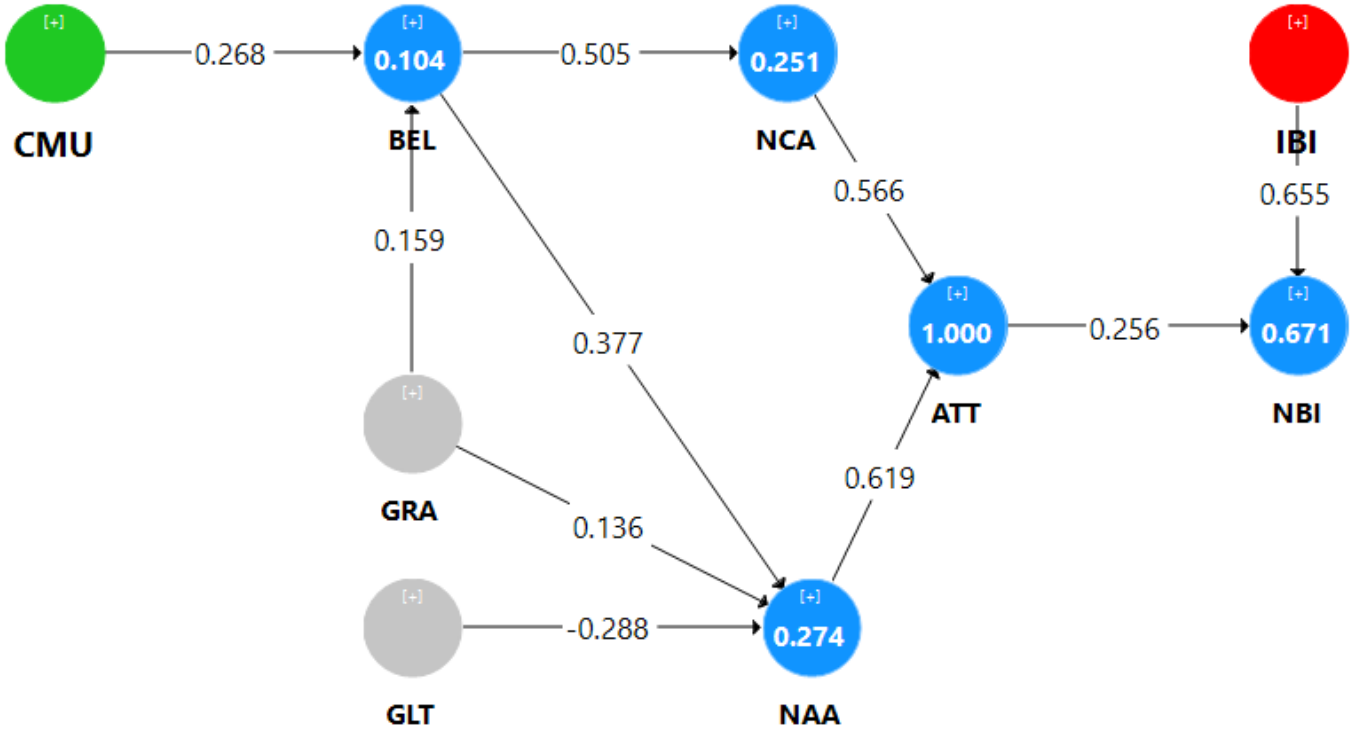
2) ALL DATA – affective negative (Group 2)



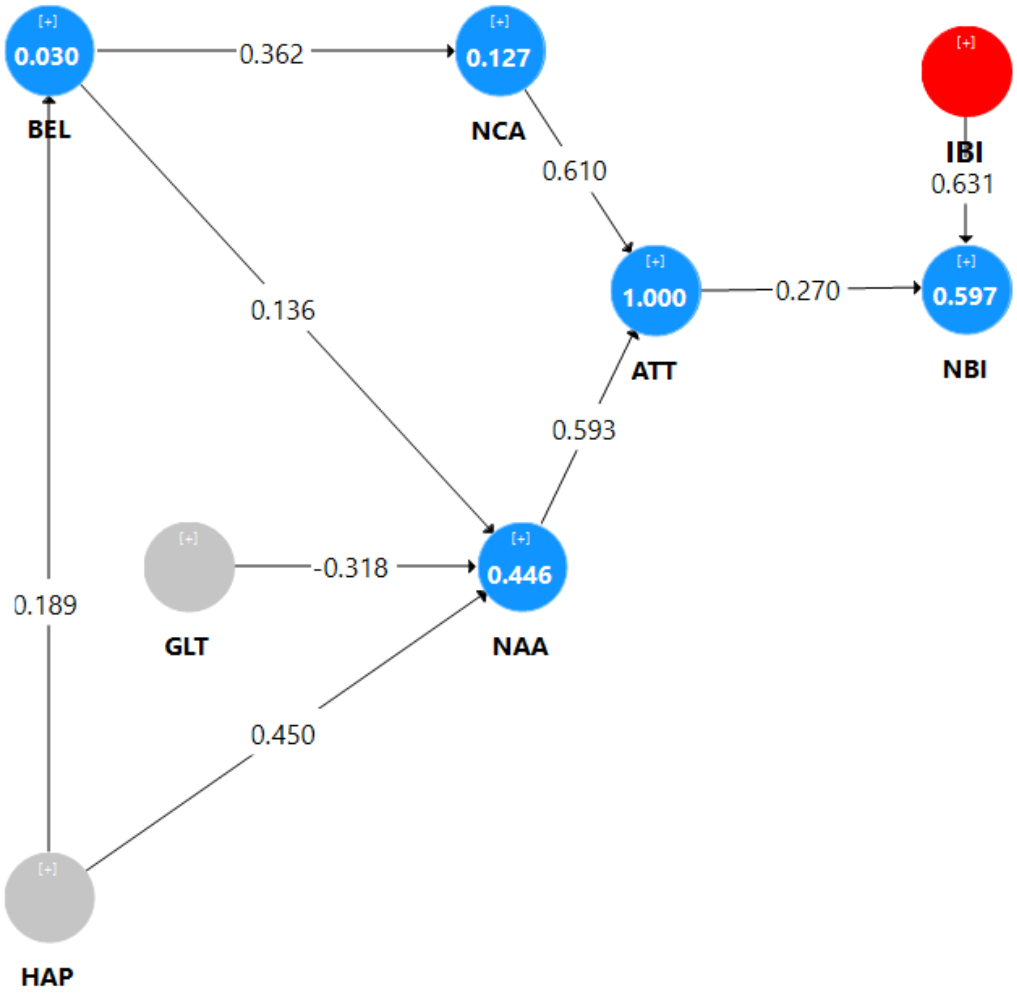
3) ALL DATA – affective positive (Group 3)



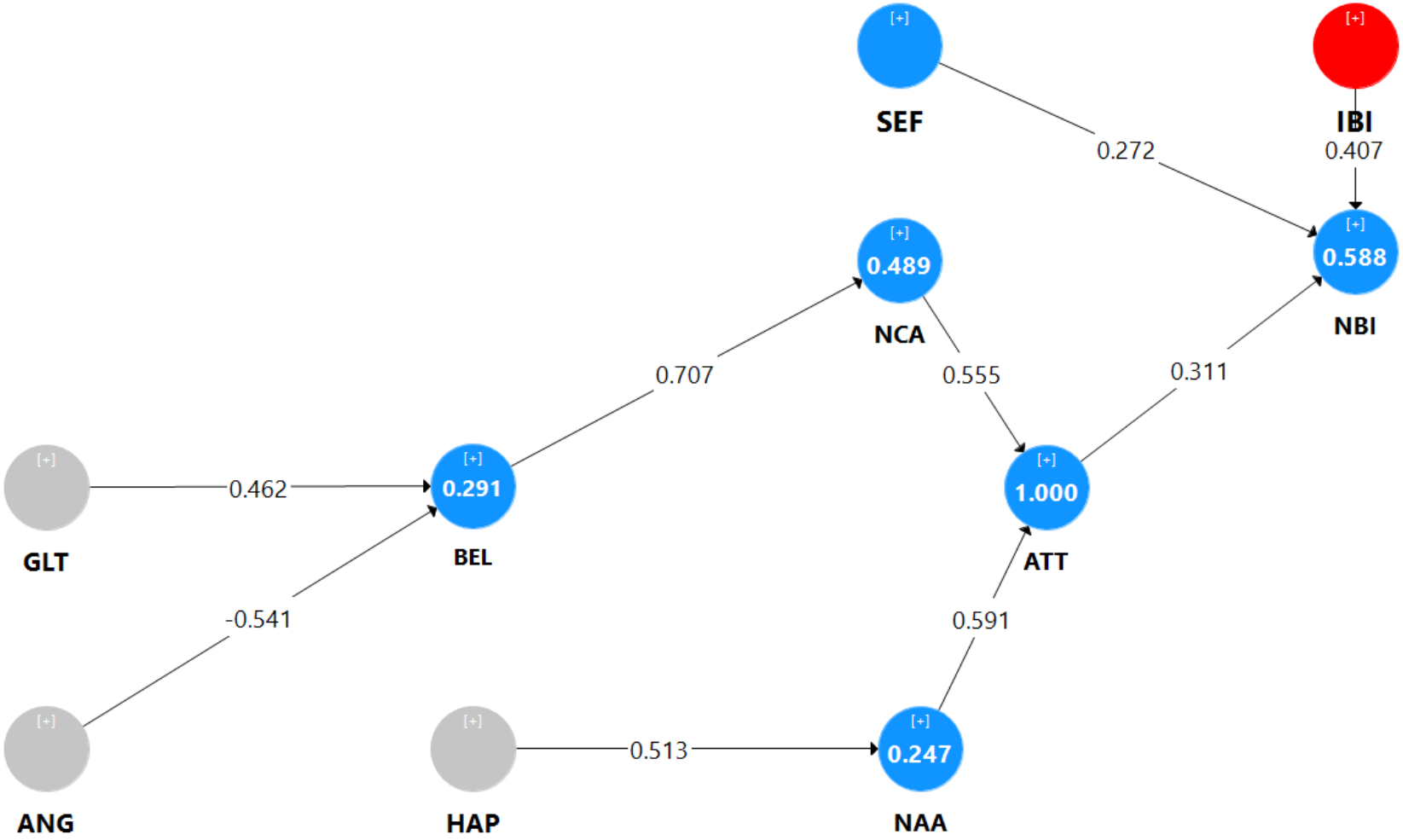
4) ALL DATA – cognitive negative (Group 4)



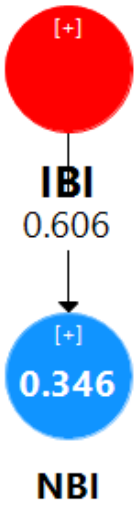
5) ALL DATA – cognitive positive (Group 5)



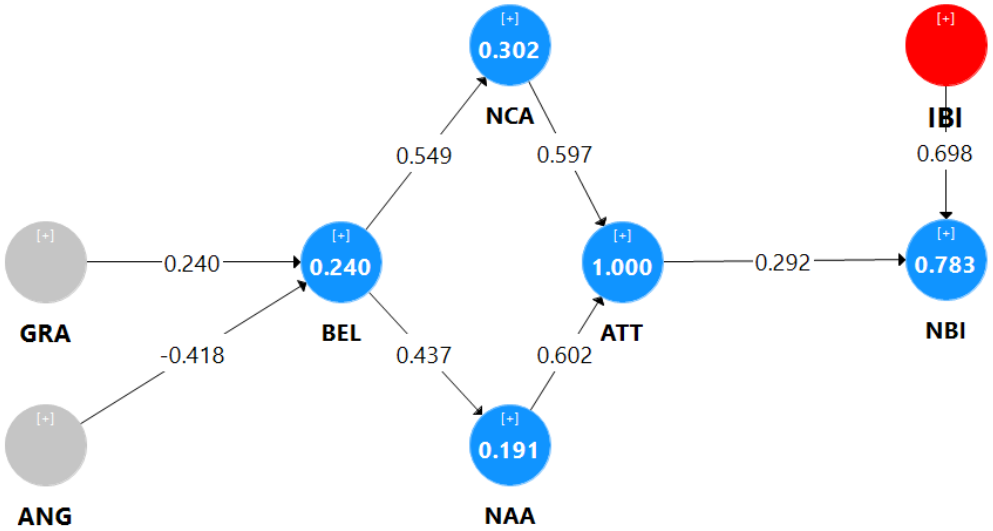
6) Cluster 1 – affective negative (Group 6)



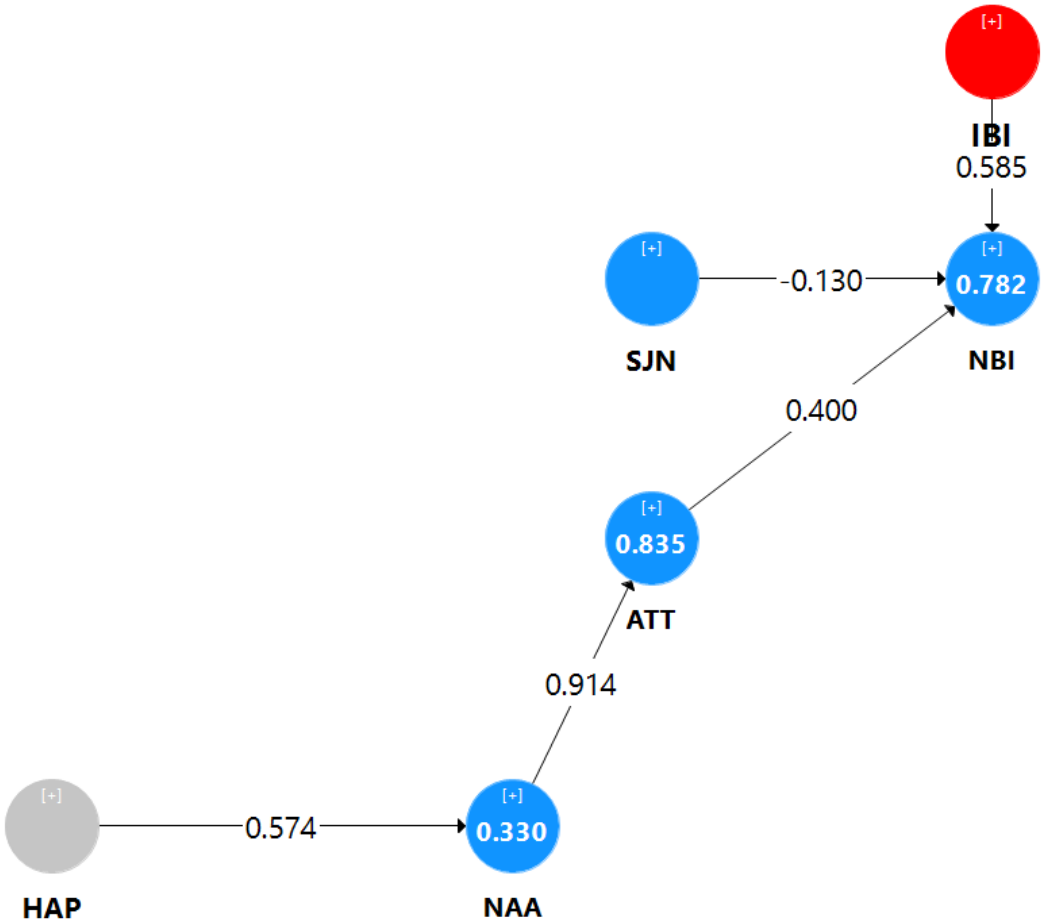
7) Cluster 1 – affective positive (Group 7)



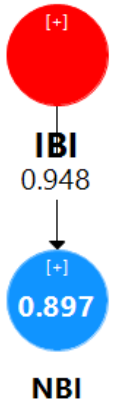
8) Cluster 1 - cognitive negative (Group 8)



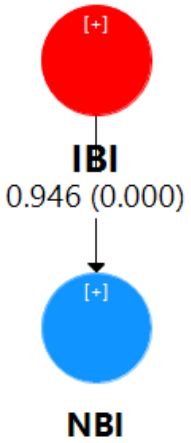
9) Cluster 1 – cognitive positive (Group 9)



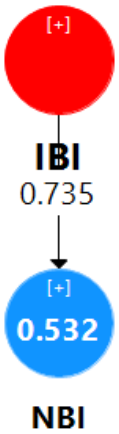
10) Cluster 2 – affective negative (Group 10)



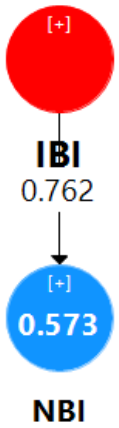
11) Cluster 2 – affective positive (Group 11)



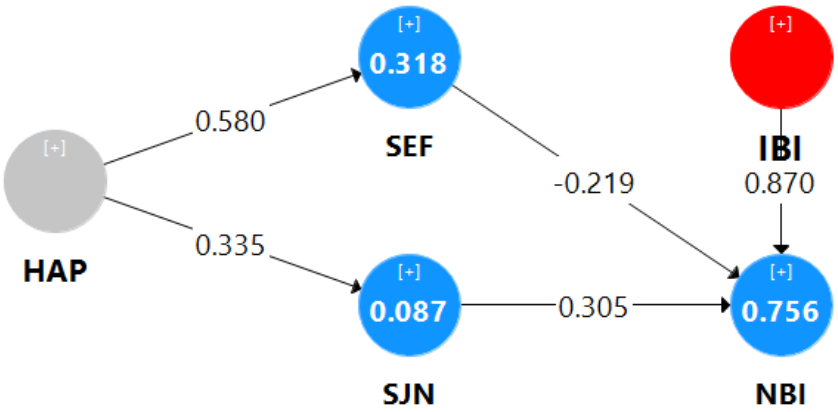
12) Cluster 2 – cognitive negative (Group 12)



13) Cluster 2 – cognitive positive (Group 13)



14) Cluster 3 – affective negative (Group 14)



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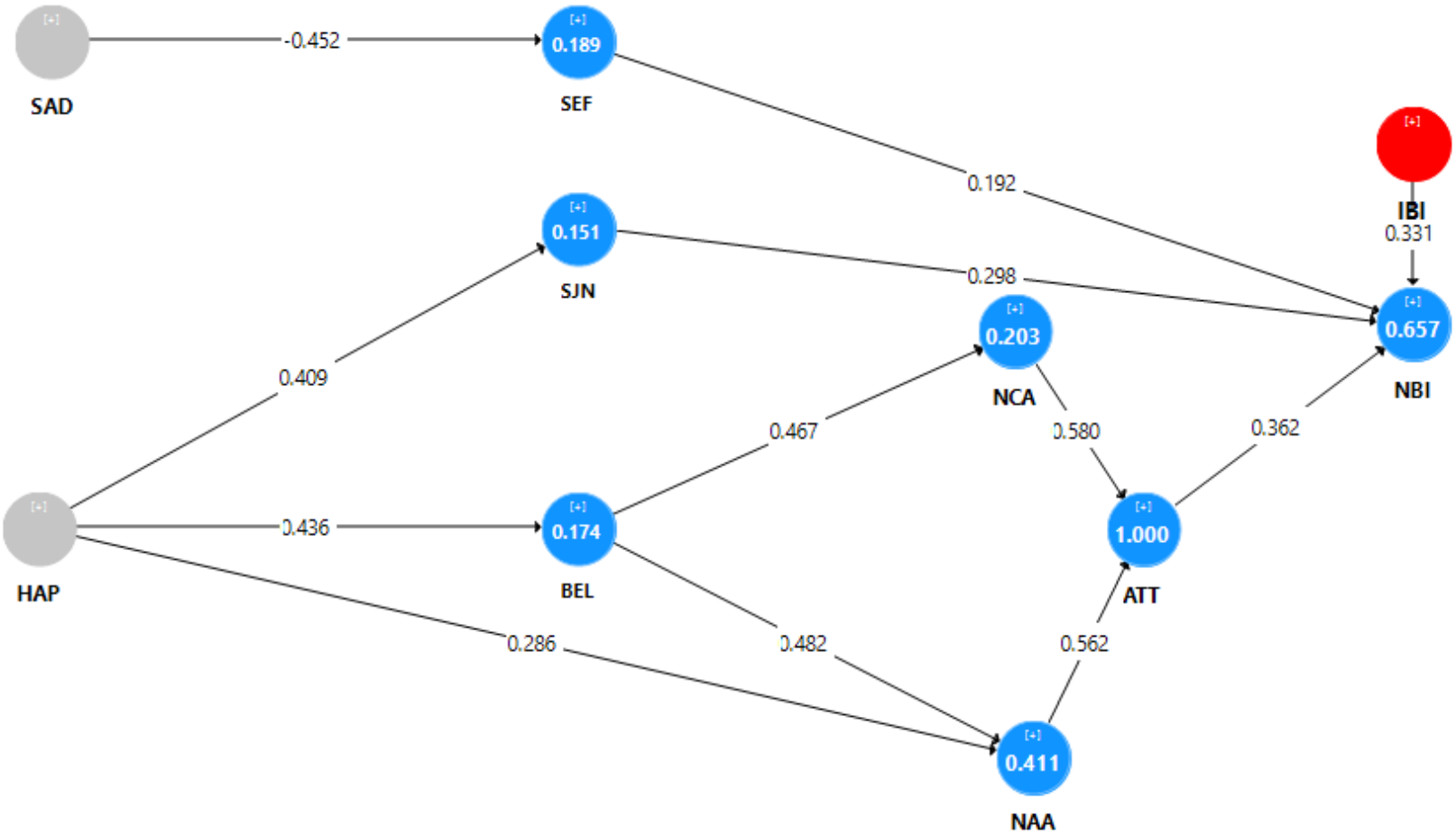
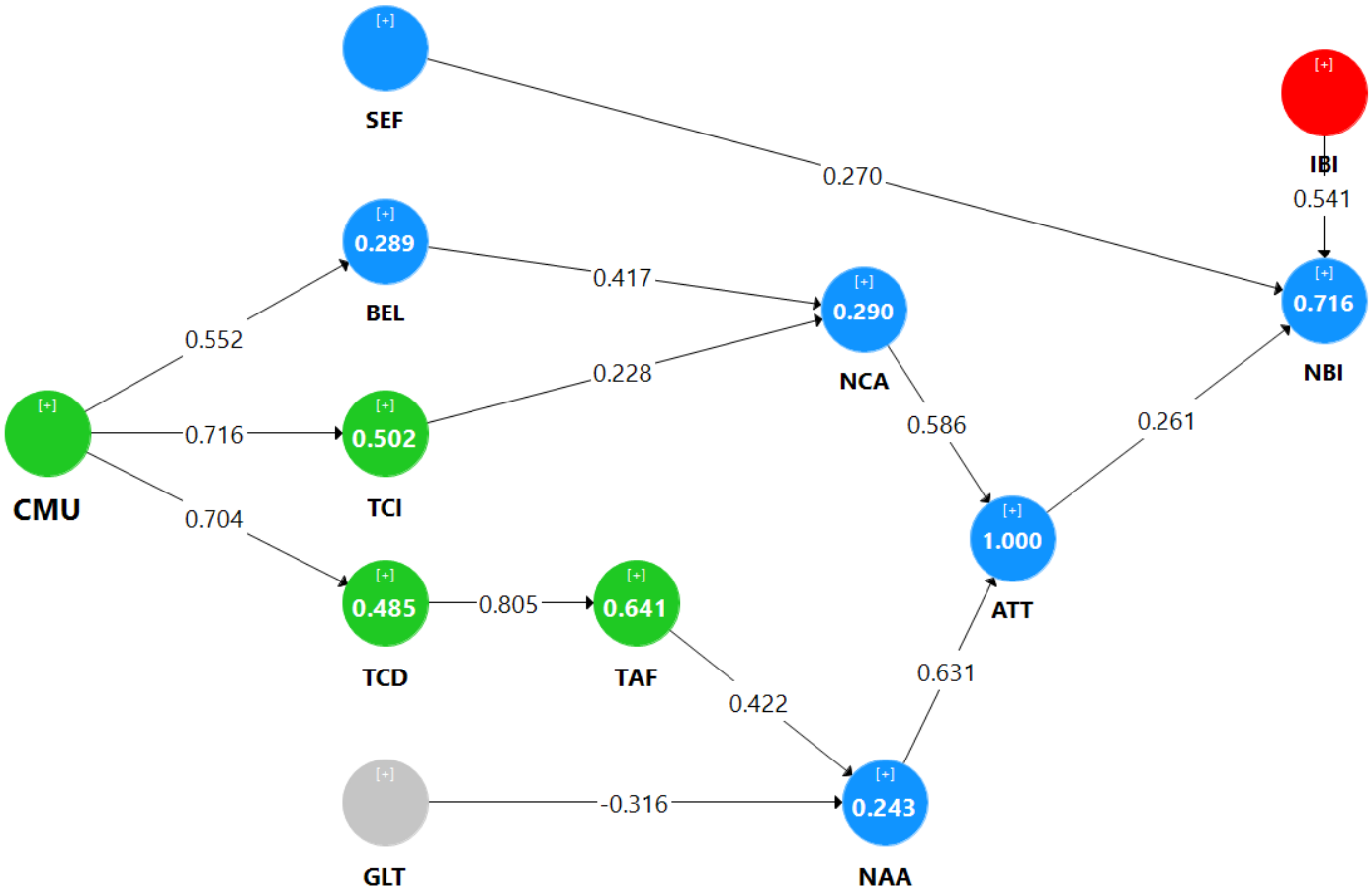
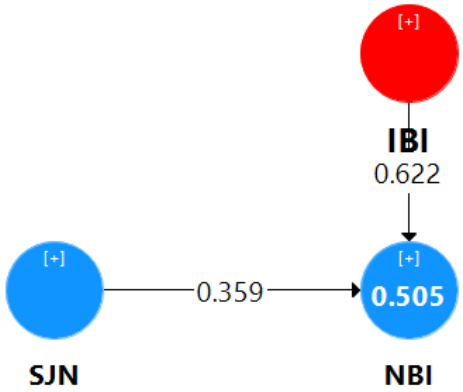


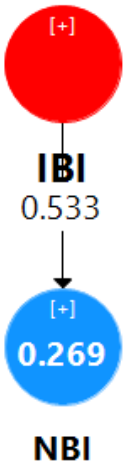
16) Cluster 3 – cognitive negative (Group 16)



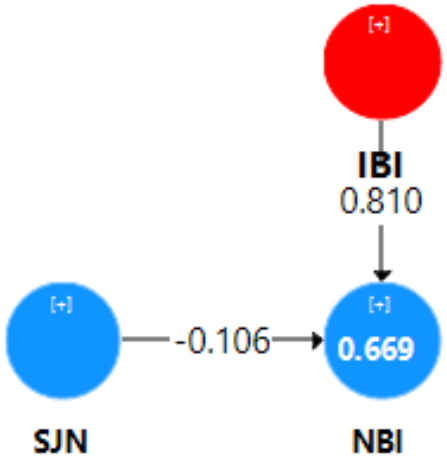
17) Cluster 3 – cognitive positive (Group 17)



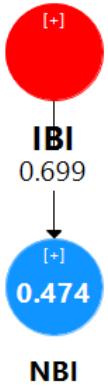
18) Cluster 4 – affective negative (Group 18)



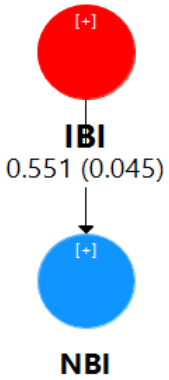
19) Cluster 4 – affective positive (Group 19)



20) Cluster 4 – cognitive negative (Group 20)



21) Cluster 4 – cognitive positive (Group 21)



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