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Intergenerational influence on sustainable consumer attitudes and behaviors: Roles of family communication and peer influence in environmental consumer socialization

Oguzhan Essiz¹  | Carter Mandrik² 

¹Department of Economics and Business, Central European University, Vienna, Austria

²Department of Business Administration, Middle East Technical University, Northern Cyprus Campus, Guzelyurt, TRNC, Mersin, Turkey

Correspondence

Oguzhan Essiz, Department of Economics and Business, Central European University, Vienna, Quellenstraße 51-55, 1100 Vienna, Austria.

Email: essiz_oguzhan@phd.ceu.edu

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Abstract

Intergenerational research on sustainable consumption remains scarce, particularly in relation to which factors may affect the level of intergenerational similarity and the direction of intergenerational transmission. The present study addresses these gaps and adds to the growing body of literature in environmental consumer socialization by examining intergenerational influence on sustainable consumer attitudes and behaviors in a sample of 146 dyads comprised of mothers and college-age daughters. In the domain of intergenerational influence, we study two potential moderating factors suggested in past consumer research: communication effectiveness and peer conformity. Using the co-orientational model and nominal dyad method, we reveal the existence of intergenerational similarity in dyads' sustainable consumer attitudes and behaviors—after accounting for nominal effects— and show that stronger parent–child communication between mother–daughter pairs leads to greater intergenerational similarity, whereas stronger peer influence on daughters reduces intergenerational agreement. Our analysis further suggests the presence of reverse environmental socialization, in which intergenerational influence predominantly occurs from daughter to mother. Dyads' subjective knowledge regarding sustainable consumption provides empirical insights for this co-orientational model finding on reverse intergenerational transfer. Overall, outcomes of this study encourage marketing managers to leverage young-adult offspring in the process of communicating sustainable marketing strategies.

KEYWORDS

consumer socialization, family communication, intergenerational influence, peer influence, subjective knowledge, sustainable consumer attitudes, sustainable consumer behaviors

1 | INTRODUCTION

During the last few decades, scholars have investigated the crucial topic of consumer socialization (e.g., John, 1999; Moschis & Churchill, 1978; Moschis, 1985; Ward, 1974). Within the context of

consumer socialization, the focus is on understanding how young consumers, from childhood, acquire resources, knowledge, skills, beliefs, and behaviors related to the marketplace while developing their unique consumer identity and turning themselves into “practicing consumers” (Ward, 1974). Socializing agents such as family or

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nonfamily institutions like mass media, marketing institutions, schools, peers, and culture have been identified to be influential in shaping the consumer socialization process (John, 1999; Moschis, 1985). Among these, the family, particularly parents, is recognized to be the pivotal socialization agent in the development of consumption preferences (e.g., John, 1999; Mandrik et al., 2005; Moore et al., 2002; Moschis, 1985), as individuals routinely engage in social interactions within family units during their developmental years.

Under the broader heading of consumer socialization, a phenomenon known as intergenerational influence (IGI) exists within the family and denotes the transfer of marketplace resources, preferences, values, attitudes, and behaviors from one generation to another both directly and indirectly, with an enduring effect that may span across many generations (e.g., Grønhøj & Thøgersen, 2009; Heckler et al., 1989; Mandrik et al., 2005; Moore et al., 2002; Shah & Mittal, 1997; Viswanathan et al., 2000). The scope of IGI is wide, with influence observed among family members across a variety of domains. Consumer behavior research has documented IGI in the adoption of marketplace beliefs and motivations (Carlson et al., 1994; Mandrik et al., 2005; Moore-Shay & Lutz, 1988), shopping and clothing preferences (Francis & Burns, 1992), purchase of auto insurance (Woodson et al., 1976), brand preferences (Mandrik et al., 2005, 2018; Moore-Shay & Lutz, 1988), brand equity (Moore et al., 2002), perceived risk (Arndt, 1972), innovativeness (Cotte & Wood, 2004), skepticism of advertising (Obermiller & Spangenberg, 2000), and the deal proneness of consumers (Schindler et al., 2014), among others.

Nonetheless, relatively little intergenerational (IG) research has been directed towards investigating sustainable (i.e., pro-environmental) consumer orientations. Previous research strengthens the notion that family is an essential locus for sustainable consumer socialization (Grønhøj & Thøgersen, 2009, 2012, 2017; Grønhøj, 2007; Matthies & Wallis, 2015; Matthies et al., 2012) and, in a broad sense, these studies have identified family influence as a critical driving factor of sustainable consumer attitudes (SCAs) and behaviors (SCBs) of individuals. Yet this existing research has left largely unmapped key questions regarding which factors may affect the level of IGI and the direction of IG transmission when it comes to sustainable consumption. Undeniably, this growing body of research in sustainable consumer socialization is still in the early stages and researchers have called for theoretical and methodological advancement. As Grønhøj and Thøgersen (2009, p.419) note, "Future sustainable IG consumer research should systematically focus on different cultural contexts to uncover the extent to which IG transfers of sustainable orientations are universal processes." Moreover, Leppänen et al. (2012, p.174) call for future investigations involving only same-sex and single dyad type—in line with Moschis (1988)—to enhance the stability of intergenerational effects on sustainable attitudes, as previous efforts included more than one dyad type in their samples (e.g., Grønhøj & Thøgersen, 2009, 2012; Matthies et al., 2012; Meeusen, 2014).

The current paper answers these calls for IG research aimed at understanding factors influencing the development of sustainable

consumption habits. We seek to provide empirical evidence for the existence of IGI on SCAs and behaviors among Turkish mother and college-age daughter dyads, incorporating the co-orientational model framework (Chaffee & McLeod, 1968) augmented by confirming self-report measures and examining parent-child communication (PCC) and peer influence (PI) as potential influential factors of IGI. The paper also aims to shed light on the direction of influence in the transmission of SCAs and behaviors, investigating the role of subjective knowledge to explicate the transmission process. This study has theoretical, methodological, and practical implications. Theory is developed by enhancing our understanding of the factors that affect IGI in the domain of sustainable consumption, and to understand more thoroughly conditions for reverse IGI. Methodologically, the co-orientational model's predictions are triangulated with a multi-trait, multi-method approach, and the nominal dyad method (Mandrik et al., 2005) is employed to provide a more rigorous testing method. Finally, we recognize the heightened role of developing countries in decreasing global environmental degradation (e.g., Singh et al., 2020), particularly consumption patterns of Turkish households which pose a major barrier to Turkey's 2030 sustainable development goals (e.g., Şener & Hazer, 2008), and we offer practical suggestions based on this study's outcomes. In the remaining sections, relevant literature is reviewed to provide a conceptual background for research hypotheses, the method for testing them is explained, and an empirical study and its results are discussed along with their implications.

2 | LITERATURE REVIEW

2.1 | Background of SCAs and behaviors

We live in a culture of consumption, and consumption is indistinguishably allied to sustainability: current unsustainable consumption modes and their negative consequences for the environment stand as daunting problems facing humanity. The global consumer culture has surpassed thresholds of overconsumption, as questions about which products to buy, how much to buy, and how to consume goods and services have critical implications for the well-being of future generations (Trudel, 2019). To that end, understanding consumer attitudes and behaviors related to sustainable consumption becomes a vital endeavor. Peattie (2010) highlights that attitudes, norms, and habits of individual consumers are the main determinant factors in the achievability of sustainable consumption. We define sustainable consumer attitudes and behaviors in line with the basic view of Fishbein and Ajzen (1977) as the set of beliefs, feelings, and intentions concerning sustainable consumption activities, as well as a consumer's predisposition to respond favorably or unfavorably with respect to such activities. Our approach is in parallel with this definition by Luchs and Mooradian (2012, p. 129): "Consumer attitudes and behaviors that are influenced by concern for environmental, social and economic considerations," defining the sustainability notion to embrace the "Three Pillars" (i.e., environmental, social, economic) view of the United Nations (2002) and in line with the 1987 Brundtland Report's sustainability definition (United Nations, 1987).

Admittedly, sustainable consumer behaviors consist of a wide range of activities, potentially involved in nearly all spheres of life. Consumer research exists on various behaviors and activities such as energy-saving and water-saving (Gadenne et al., 2011; Gilg & Barr, 2006), sustainable product choice (Liang & Guo, 2021; Tanner & Wölfling Kast, 2003), sustainable dieting (Werner et al., 2019), sustainable giving (Ha-Brookshire & Hodges, 2009), eco-clothing (Niinimäki, 2010), sustainable transportation (Hartl et al., 2018), and environmentally oriented anticonsumption of food (Dalmoro et al., 2020), among others. Nonetheless, research on sustainable consumer attitudes and behaviors is equivocal. On one side, there is evidence supporting the positive link between attitudes and behaviors (Arslan et al., 2012; Tanner & Wölfling Kast, 2003). On the other side, some empirical research reports contradictions (Vermeir & Verbeke, 2006; Young et al., 2010), revealing a gap in which the relationship between attitudes and behaviors is under stress when it comes to consuming sustainably. This “attitude-behavior gap” (Luchs et al., 2010; Peattie & Belz, 2010) exists when consumers embrace positive attitudes toward sustainable consumption, yet face hurdles in converting their attitudes into actual marketplace behaviors, such as green purchasing. Investigating social factors, especially family-related ones, may offer myriad insights to better understand the total sustainable consumption process (Matthies & Wallis, 2015) and, thus, shed light on this attitude-behavior gap.

Importantly, Peattie (2010, p. 203) explains that a vast amount of research in sustainable consumption commonly concentrates on three categories: “housing, transportation, and food choices.” Naturally, all these consumption categories include family members living in a household and involve choices made in their daily lives. Further underlining the importance for sustainability of studying the family, a comparative study with participants from 43 countries revealed how great of an impact household consumption has on sustainability: household consumption negatively contributes more than 60% to global greenhouse gas emissions, as well as from 50% to 80% of the material, water, and land usage (Ivanova et al., 2016). To mitigate the total negative environmental impacts of households, one needs to investigate how individuals within family units make decisions and influence each other in the process of sustainable consumption (Matthies & Wallis, 2015). In parallel with the view of Peattie (2010, p. 219), we realize that the development of sustainable consumption patterns may require more collective consumption behaviors, in which individual consumers may respond to such patterns as collective decision units (as families or households). Building our study on these grounds, we next review the literature on research related to intergenerational influence and sustainable consumption.

2.2 | Intergenerational influence and sustainable consumption

Empirical research, both quantitative and qualitative, exists on sustainable family socialization and intergenerational influence across a wide swath of environmental psychology and education literature

(e.g., Ando et al., 2015; Casaló & Escario, 2016; Gentina & Muratore, 2012; Gentina & Singh, 2015; Grønhøj & Thøgersen, 2009, 2012, 2017; Grønhøj, 2007; Katz-Gerro et al., 2020; Leppänen et al., 2012; Matthies & Wallis, 2015; Matthies et al., 2012; Meeusen, 2014; Nakamura, 2003; Singh et al., 2020). However, only a few researchers examined the topic by adapting the perspective of consumer socialization theory (e.g., Grønhøj & Thøgersen, 2009, 2012; Grønhøj, 2007; Katz-Gerro et al., 2020; Matthies & Wallis, 2015; Singh et al., 2020). Not surprisingly, early environmental studies largely focused on developed countries, as issues related to environmental protection and resource preservation have been on the political and social agenda for many years. To date, these studies are generally consistent in identifying the family (mostly parents and youngsters) as an agent of sustainable socialization, reporting significant intergenerational transmission of a variety of sustainable values, beliefs, and practices such as environmental consciousness (Nakamura, 2003), environmental concern (Casaló & Escario, 2016; Meeusen, 2014; Singh et al., 2020), recycling and reuse (Katz-Gerro et al., 2020; Matthies et al., 2012), waste disposal (Ando et al., 2015; Grønhøj & Thøgersen, 2009, 2012), energy consumption (Grønhøj & Thøgersen, 2009; Grønhøj, 2007), water-saving (Grønhøj, 2007; Katz-Gerro et al., 2020), and organic buying behaviors (Grønhøj & Thøgersen, 2009). This past research reported stronger correlations between girls and mothers, and girls were found to be more concerned about the environment compared to boys (e.g., Casaló & Escario, 2016; Leppänen et al., 2012). They also reported stronger effect sizes for visible behaviors (e.g., purchasing sustainable products) compared to invisible ones (e.g., electricity-saving), as parents and children may have more opportunities to learn from each other while engaging in visible behaviors (Grønhøj & Thøgersen, 2009; Meeusen, 2014). It would be reasonable to assume that the effect sizes of these studies may differ depending on the place (i.e., household, school, or work) in which consumption behaviors occur (Matthies & Wallis, 2015). Despite these previous efforts, intergenerational similarities in many other behaviors (e.g., fair trade, donation, traveling) linked to the sustainable consumption domain remain as yet uninvestigated.

Taken together, early research has sought to associate IG transmission of sustainable consumption attitudes and behaviors with several factors, such as personal values (Grønhøj & Thøgersen, 2009, 2012), family norms (Grønhøj & Thøgersen, 2012; Matthies et al., 2012), parenting style (Gentina & Muratore, 2012; Grønhøj & Thøgersen, 2017), socialization style (Katz-Gerro et al., 2020), family communication patterns (Meeusen, 2014), the influence of friends (Collado et al., 2017), cultural differences (Ando et al., 2015; Gentina & Singh, 2015), gender-specific variations (Leppänen et al., 2012; Meeusen, 2014), and the age group of a child (Grønhøj & Thøgersen, 2017; Matthies et al., 2012). Overall, this growing literature stresses the critical argument that the family socialization process of sustainable consumption should embrace transmission of intentions and impacts, which gives us the motivation to study sustainable consumer attitudes and behaviors. Table 1 provides detailed information about the general state of research in

TABLE 1 Sustainable family socialization and intergenerational research

Literature overview on sustainable family socialization and intergenerational influence			
Author(s) and year	Subjects and sample size	Age group of offsprings	Study domain(s)
Nakamura (2003)	273 Japanese families: Mothers and their offsprings	The majority of participants were high school age	IG1 on environmental consciousness
Grønhoj (2007)	175 Danish offsprings	16-22 years old	Exploration of the sustainable consumer socialization process
Grønhoj and Thøgersen (2009)	601 Danish families: Two available representatives from each family: A parent and an adolescent	16-18 years old	IG transfer of environmental values, attitudes, and behaviors, focusing on three specific household consumption practices
Grønhoj and Thøgersen (2012)	601 Danish families: Two available representatives from each family: A parent and an adolescent	16-18 years old	IG transfer of three pro-environmental consumption behaviors: Special attention on family norms and personal attitudes
Matthies et al. (2012)	206 German families: Parent-child dyads	8-10 years old	IG transfer of re-use and recycling behaviors: Roles of norms and behaviors of parents
Meeusen (2014)	2085 Belgian families: Parents and offsprings	15 years old	IG transfer of environmental concern: Roles of communication patterns and gender differences
Matthies and Wallis (2015)	Not applicable	Not applicable	A review study on family socialization and sustainable consumption
Ando et al. (2015)	221 German and 365 Japanese families: Parent-child pairs	Germany: 9,6 years Japan: 9,4 years	A cross-cultural study on IG transmission of pro-environmental behaviors: Investigating the role of cultural differences
Casaló and Escaró (2016)	95,008 families from sixteen different countries: Parents and offsprings	15 years old in all countries	IG transmission of environmental concern: The role of gender differences
Grønhoj and Thøgersen (2017)	448 Danish families: Two available representatives from each family: A parent and an adolescent	18-20 years old	The role of parenting style in the IG transmission of three pro-environmental consumption behaviors
Singh et al. (2020)	352 Indian parent-adolescent pairs	13-18 years old	Examination of pro-environmental attitudes and behaviors with a reverse socialization perspective: Effects of environmental concern, knowledge, and influence strategies
			Adapted the consumer socialization theory (e.g., John, 1999; Ward, 1974), a quantitative study followed the survey method
			Adapted a qualitative research approach: Essay writing method
			Adapted the Schwartz (1994) Theory of ten universal values, conducted an online survey by following a quantitative approach
			Adapted the consumer socialization theory (e.g., John, 1999; Ward, 1974), a quantitative study
			Adapted the norm activation model (Schwartz, 1977), conducted self-administrated surveys by utilizing a quantitative approach
			Used a representative data from parent-child socialization study (PCSS) and followed a quantitative approach
			Proposed a dual view model for studying the family transfer of sustainable consumption practices
			Adapted the theory of planned behavior (Ajzen, 1985, 1991), the social learning theory (Bandura & Walters, 1977), and used the survey method
			Adapted the gender schema theory (Bem, 1985), available data retrieved from PISA surveys
			Adapted the self-determination theory (Deci & Ryan, 1985), the social learning theory (Bandura & Walters, 1977), and carried out an online survey with a quantitative approach
			Followed the consumer socialization theory (e.g., John, 1999; Ward, 1974), adapted the survey method to validate the proposed conceptual model

the field. Note that among the many factors investigated as affecting IGI on sustainable consumption, communication effectiveness and peer conformity have received almost no direct attention. However, past research points to them being important moderators of IGI (Mandrik et al., 2005, 2018; Moore et al., 2002); therefore, we include them for examination here, yet extend past research by exploring not only outcome (observed) measures of communication but self-reported communication as well. A final gap to note is the paucity of research investigating possible reverse intergenerational influence on sustainable consumption—that is, transmission of values and attitudes from child to parent (see Singh et al., 2020 for an exception). As reverse IGI may occur in various consumption situations such as the acquisition of new technologies, visible brands, and concrete products (e.g., Mandrik et al., 2018; Moore et al., 2002; Moore-Shay & Lutz, 1988; Obermiller & Spangenberg, 2000), it is reasonable that reverse IGI may exist for the relatively new and esoteric topic of sustainable consumption, where college-age children may have more perceived expertise (e.g., Shah & Mittal, 1997). As aforementioned, in the current study we investigate the role of subjective knowledge as a potential factor in determining direction of influence.

3 | CONCEPTUAL DEVELOPMENT AND HYPOTHESES

3.1 | The co-orientational model

Unlike existing sustainable IG research, we apply a different conceptual model to study IG transmission. As a main method of inquiry, the framework of this study is based on the co-orientational model (Chaffee & McLeod, 1968). This model (see Figure 1) is appropriate for exploring IGI, primarily fits to dyadic interactions, and it has been employed in other IG consumer research apart from the sustainable consumption domain (e.g., Mandrik et al., 2005, 2018; Moore et al., 2002; Moore-Shay & Lutz, 1988). The model includes two key constructs: (1) *agreement* is conceptualized as the degree of consistency among cognitions of two people and (2) *accuracy*, which is each dyad members' prediction ability to accurately state the cognitions of their partners (Chaffee & McLeod, 1968). In brief, agreement describes whether two people's cognitions (such as their beliefs or preferences) match with each other, while accuracy shows how well each dyad partner knows the other person's attitudes and behaviors akin to sustainable consumption for our case.

Using the accuracy construct, past research makes inferences about the communication effectiveness between two people, where higher prediction accuracy is seen to indicate more effective communication among dyads (e.g., Chaffee & McLeod, 1968; Mandrik et al., 2005, 2018; Moore-Shay & Lutz, 1988). Moreover, prediction accuracy has been adapted by researchers as a reliable indicator to predict the direction of intergenerational influence (e.g., Mandrik et al., 2005, 2018; Moore-Shay & Lutz, 1988; Schindler et al., 2014). We will revisit the constructs of the co-orientational model later in the paper.

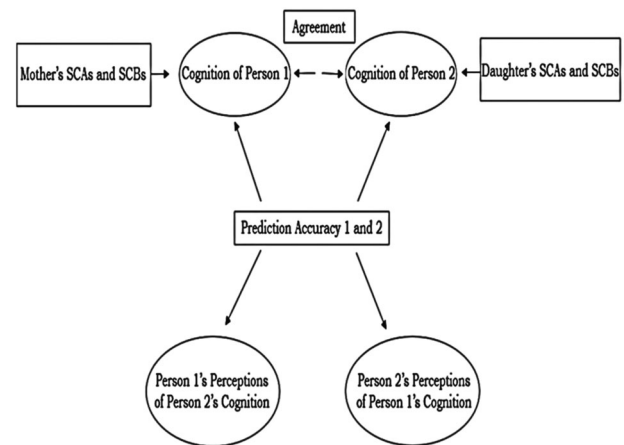


FIGURE 1 The co-orientational model (modified from Chaffee & McLeod, 1968)

3.2 | Intergenerational influence on SCAs and behaviors

Earlier research provides evidence regarding the presence of family influence in the transmission of sustainable consumption (Ando et al., 2015; Casaló & Escario, 2016; Grønhøj & Thøgersen, 2009, 2012, 2017; Katz-Gerro et al., 2020; Leppänen et al., 2012; Meeusen, 2014). However, this literature used simple raw agreement or similarity scores between parent and child as the direct indicator of intergenerational transmission. Undeniably, using simple agreement scores may overstate the actual effect and even may show an effect when one does not in fact exist, owing to background factors that increase the likelihood that both dyad members hold the same cognitions (Mandrik et al., 2005). Thus, prior research results may have over-stated the actual intergenerational similarity by ignoring the incipient level of similarity occurring between dyads (for further consideration of this issue, see Mandrik et al., 2005; Viswanathan et al., 2000). To control for spurious effects, Mandrik et al. (2005) introduced the “nominal dyad” method, which in essence creates randomly paired dyads (i.e., nominal dyads) and a so-called “nominal effect” similarity score against which to test the observed similarity score. Given that there has been no direct test of intergenerational influence on SCAs and behaviors among mother–daughter dyads accounting for the nominal effect, our first hypothesis is a fundamental one associated with the presence of “true” intergenerational influence.

H1: *Intergenerational influence on sustainable consumer attitudes and behaviors exists between daughters and mothers.*

3.3 | Family communication

Family communication has been recognized as a pivotal mechanism in IG transfer of consumption-related attitudes and behaviors (Moschis & Churchill, 1978; Moschis et al., 1984; Moschis, 1985;

Viswanathan et al., 2000) as it adds explicitly to consumer learning. Moschis and Churchill (1978, p. 607) describe the intra-family communication as “overt interactions between children and parents about goods and services.” The effectiveness of interactions—parent-child communication—is established by three elements: “frequency, pattern, and intent” (Moschis et al., 1984). These elements influence a child’s learning process while interacting with other information sources as consumers. Hence, it is plausible to presume that parents and children who participate in more frequent and active communication about each other’s consumption habits are likely to exhibit greater intergenerational similarity (e.g., Moschis, 1985).

Regarding sustainable consumption, many topics including energy-water consumption, household waste, organic buying, recycling, and environmental concern may be pertinent features of family life, prompting family members to discuss these issues. Communicating more about the environment tends to make sustainable consumer behaviors more explicit (Grønhoj & Thøgersen, 2012), and as families talk more about the source of environmental problems, children may be more likely to build personal norms and consciousness to augment their sustainable behaviors, such as paper re-use (Matthies et al., 2012). Building on this issue, Mead et al. (2012) document the positive relationship between family communication and information-seeking behaviors of adolescents on global climate change, while Meeusen (2014) shows the strong positive influence of family communication patterns on intergenerational transmission of environmental concern.

Apart from this environmental research, other IG studies in the general consumption domain support the positive influence of family communication on the IG similarity of brand preferences, product and store choices, and numerous consumption values of offspring (Heckler et al., 1989; Mandrik et al., 2005, 2018). For example, using Chaffee and McLeod’s (1968) co-orientational model as a basis, Mandrik et al. (2005) showed communication effectiveness was positively related to mother–daughter similarity of brand preferences and five consumption orientations, such as value consciousness (Lichtenstein et al., 1990), prestige sensitivity (Lichtenstein et al., 1993), and convenience orientation (Mandrik, 1996). Based on this past research, we expect a greater intergenerational similarity between daughters and mothers with an increase in communication effectiveness and state the following hypothesis:

H2: *Communication effectiveness between mothers and daughters is positively related to intergenerational influence on sustainable consumer attitudes and behaviors.*

3.4 | Peer influence

Peers are considered one of the key socialization agents in the consumer socialization process (John, 1999; Moschis & Churchill, 1978). Research documents that peers play prominent roles in the development of sustainable consumer identity, affecting their friends’ recycling activities (Chawla, 2009), purchase intention of organic products (Gotschi et al., 2009; Salazar et al., 2013),

sustainable attitudes (Collado et al., 2017; Duarte et al., 2017), and behaviors (Collado et al., 2019). Collado et al. (2017) showed the role of peers as positive agents of environmental socialization, revealing that peers significantly explained their counterparts’ environmental attitudes, with larger effects for older children than younger ones. In a follow-up study, Collado et al. (2019) demonstrated that peers may in fact exert normative influences, shaping adolescents’ self-reported sustainable behaviors and assisting them to develop moral responsibility towards the environment through direct influences. In sum, the literature generally supports the influence of peer-based reference groups on offspring’s sustainable consumption habits.

Past consumer socialization studies indicate that children spend more time with their friends and devote less time to their parents as they grow up (Bearden & Rose, 1990; Meyer & Anderson, 2000; Ward, 1974). Moreover, children willfully engage in more regular communication patterns with their peers, who may help them to establish social motives for consumption (Moschis & Churchill, 1978). In this respect, it follows that individuals who are more prone to social influence should follow their peers’ lead and show less parental similarity in their consumption preferences. This moderating effect of peer influence on IG similarity has been found for the consumption orientation prestige sensitivity (Mandrik et al., 2005), as well as for brand preferences (Mandrik et al., 2018). The latter research also supported the proposition that the attenuating influence of peers on IGI varies between cultures.

From the perspective of culture, the Turkish sample studied here is considered highly collectivistic, based on the cultural dimensions of Hofstede (Hofstede Insights, 2021; Hofstede, 1984): “We” is important for our subjects as individuals in collectivistic cultures commonly exhibit more attachment to in-group members’ goals. To that end, younger children firmly depend on parental influence, while older children rely more on their peers to attain socially important consumption cues (Moore et al., 2002; Moschis & Moore, 1979). Earlier, Lee (2010, 2014) documented the role of PI as a factor predicting green purchase behaviors of consumers in a collectivistic society (Hong Kong), where young adult consumers more often sought advice from peers when engaging in sustainable consumption practices. In light of the preceding review, we recognize that daughter participants in this study live apart from their families and are surrounded by their peers in the college environment. Immersed among their peers and subject to their influence, daughters may acquire different sustainable consumption knowledge, preferences, attitudes, and behaviors from mothers, which may weaken the true intergenerational similarity. It thus may be expected that stronger PI would attenuate the mother–daughter similarity for SCAs and behaviors, which leads to the following hypothesis:

H3: *Peer influence on daughters is negatively related to intergenerational influence on sustainable consumer attitudes and behaviors.*

3.5 | The direction of intergenerational influence

Vital elements of intergenerational influence emanate from socialization theory. John (1999) indicated that social interactions may lead

to the synchronization of consumption-related beliefs to some degree within family members, occurring by happenstance from parents to children. However, it is also understood that children may attempt to influence their parents, showing them the way in the adoption of new consumer skills, knowledge, and attitudes, a process recognized as reverse or reciprocal consumer socialization (e.g., Ekstrom et al., 1987; Ekstrom, 1995, 2007; Singh et al., 2020). Correspondingly, reverse IGI denotes the influence of children on parents.

As aforementioned, in the college environment, students may be exposed to information on new high-tech products associated with some forms of information technologies (e.g., smartphone apps, social media, computer software). For these product types, it would be logical to imagine that children may influence their parents' choices to a greater extent than their parents do, so perceived expertise on the consumption topic (Shah & Mittal, 1997) may be seen as a predictor of the direction of influence. But would such expectations hold in the transmission of sustainable consumption-related attitudes and behaviors? Unfortunately, very little research attention has been paid to enhancing our understanding of the reverse socialization process of consumers (Easterling et al., 1995; Ekstrom et al., 1987; Ekstrom, 1995, 2007; Mandrik et al., 2018; Moore et al., 2002; Moschis, 1988; Singh et al., 2020). In fact, most sustainable IG research has assumed that influence flows from parents to children (e.g., Grønhøj & Thøgersen, 2009; Leppänen et al., 2012; Meeusen, 2014) due to its compatibility with social learning theory (Bandura & Walters, 1977) and characteristics of Western culture; however, this research does not totally reject the possibility of reverse transmission. Upon closer examination, their forward IGI findings were attributed to the lower importance given to environmental commitment by the younger generation of their studied sample. Also, only basic correlations were reported to show the direction of influence intuitively; no specific methodological approaches were undertaken to demonstrate the direction of influence empirically.

Taken together, forward IGI expectations of earlier research may not always hold true. For example, Schlossberg (1992) demonstrated that young children provide environmental cues to their parents and lead the way in shifting their shopping behaviors. To present a conceptual model, Easterling et al. (1995) examined the topic of "ecological consumer resocialization," signaling that young adult children may potentially influence their parents' environmental learning process—and specific sustainable behaviors (e.g., recycling actions)—based on the availability of appropriate resources, such as favorable family communication patterns and environmental knowledge. Later, a qualitative study provided support for the existence of reverse socialization among young adult children in the context of everyday household activities, involving recycling, water, and electricity consumption in Denmark (Grønhøj, 2007). Most recently, Singh et al. (2020) provided empirical evidence for reverse sustainable socialization among 352 parent-adolescent dyads in a non-Western culture (India), revealing how adolescents' environmental concerns may influence parents' intentions to behave in a

pro-environmental way. In sum, these efforts provide testimony regarding the presence of reverse transmission in the domain of sustainability.

In the existing literature, the age group of a child (e.g., teen, young adult, mature) is seen as a factor related to reverse intergenerational influence, with older children expected to exert greater influence than younger ones (e.g., Grønhøj & Thøgersen, 2017; Mandrik et al., 2018; Matthies et al., 2012; Moore et al., 2002). Additionally, cultural differences and development levels of countries may also affect the direction of influence for sustainable consumption preferences (Ando et al., 2015; Casaló & Escario, 2016; Gentina & Singh, 2015; Katz-Gerro et al., 2020; Singh et al., 2020). Arguably, compared to developed countries and individualistic cultures, it may be more likely to see the reverse transfer in developing countries and collectivistic cultures (e.g., Singh et al., 2020). Using the co-orientational model, Mandrik et al. (2018) provided empirical evidence for this stance, showing that daughters in PRC (a highly collectivistic developing country) transfer more to their mothers compared to their US counterparts (a highly individualistic developed country). Based on the preceding discussion, we expect that reverse intergenerational transfer is more likely for the sample studied here: university-age women in a collectivistic culture in a developing country like Turkey, and propose the following hypothesis:

H4: *Intergenerational influence on sustainable consumer attitudes and behaviors is greater from daughters to mothers than from mothers to daughters.*

3.6 | Role of subjective knowledge: A research question

There may be other reasons behind reverse IG transfer in this domain, yet it remains unexplored in prior research. One factor, in particular, can be the role of subjective knowledge in IGI. Subjective knowledge may be seen as self-rated or perceived knowledge, which refers to what consumers think they know on a particular topic, as opposed to objective knowledge, which is what a person actually knows (Brucks, 1985; Park et al., 1994). Subjective environmental knowledge is positively associated with environmental motivations (e.g., Egea & de Frutos, 2013; Pagiaslis & Krontalis, 2014), and its greater impact, compared to objective knowledge, has been distinguished on environmental beliefs (Pagiaslis & Krontalis, 2014), behaviors (Ellen, 1994), and on specific practices such as organic food consumption (Pieniak et al., 2010). Considering the wide availability of information sources in the college environment (e.g., the internet, seminars, courses, voluntary initiatives, student clubs) about sustainable consumption, it can be expected for daughters to report higher subjective knowledge concerning sustainability than mothers. Indeed, it is likely that daughters may be more informed on the concept, hence they may both directly or indirectly influence their mothers' attitudes and behaviors by initiating discussions about it. Additionally, because mothers may be somewhat out of touch with

new social movements, they may see their daughters as possessing higher expertise in the sphere of sustainability and be open to influence from their daughters (e.g., Bearden & Etzel, 1982; Park & Lessig, 1977). Based on this reasoning, subjective knowledge may provide a clue as to the direction of IGI on SCAs and behaviors, in that IGI should flow from the dyad member with higher subjective knowledge. Although not an explicit hypothesis, we raise the following research question:

RQ: *Does subjective knowledge of sustainable consumption play a part in determining the direction of intergenerational influence?*

4 | METHODOLOGY

4.1 | Survey designs

Similar to prior IG consumer research conducted through the lens of consumer socialization theory (e.g., Francis & Burns, 1992; Mandrik et al., 2018; Moore et al., 2002; Moore-Shay & Lutz, 1988), we used the parallel survey methodology. In line with the parallel survey method, we prepared two different but nearly identical questionnaires for each dyad: one for daughter and one for mother. The daughters' survey was administrated via the traditional paper and pen method, as they were living on or near campus, while an online survey tool was used to administer the mothers' questionnaire, as mothers lived in their hometowns. The rationale for this approach was twofold: to reduce the use of resources (e.g., paper, printing, shipping) and to secure effective response rates, reducing non-response bias; similar (but offline) approaches were used in earlier efforts (Mandrik et al., 2005, 2018; Moore et al., 2002), where researchers obtained home addresses from on-campus daughters and sent printed questionnaires with prepared return envelopes to mothers, securing high response rates. Question items appearing in both questionnaires were simply rephrased to match the participant. As an example, an item to measure self-reported communication between daughters and mothers can be read as "There has been open communication between my mother and me over time" in the daughter's questionnaire, while the parallel item was phrased as "There has been open communication between my daughter and me over time" in the mother's questionnaire. Additionally, participants were asked to predict the other dyad partner's attitudes and behaviors related to sustainable consumption. The following is an example of a prediction question from the daughter's questionnaire: "My mother would limit her use of energy such as electricity, natural gas, or fossil fuel consumption to reduce her harm on the environment."

Questionnaires were first designed in English to maintain the originality and consistency of measurement scales, then Turkish versions of questionnaires were created. Following the parallel back-translation method (e.g., Buil et al., 2012; Malhotra et al., 1996), both instruments were translated and back-translated separately by two Turkish-English bilinguals, then the back-translated versions

compared. Any differences were resolved through discussions among the translators and principal investigators to maintain uniformity between the two language versions and to ensure the translated versions would be correctly understood by the Turkish sample.

4.2 | Sample selection, survey procedure, and sample composition

Although intergenerational influence may be observed among all family members in dyadic relations, such as mothers-daughters, fathers-daughters, mothers-sons, and fathers-sons, focusing on specific dyads may improve the reliability of research, as it limits background diversity among respondents (Moore-Shay & Lutz, 1988; Moschis, 1985, 1988). Moschis (1988) highlights the need to study specific dyad types, to understand various consumer behaviors and how they are acquired through interpersonal interactions. Same-gender dyads tend to share a higher degree of interest and similarity in the development of consumption-relevant preferences (e.g., Carlson et al., 1994; Francis & Burns, 1992; Mandrik et al., 2005, 2018; Moore et al., 2002; Moore-Shay & Lutz, 1988). And, although their influence is likely to depend on factors such as household environment (Moore et al., 2002), communication patterns (Meeusen, 2014), environmental knowledge (Singh et al., 2020), culture (Mandrik et al., 2018), and consumption domain, among others, mothers are broadly considered to be the most influential parent in socializing their children (e.g., Bakir et al., 2006; Carlson et al., 1994; Francis & Burns, 1992; Mandrik et al., 2005, 2018; Moore-Shay & Lutz, 1988; Moschis, 1985; Xu et al., 2004). Based on these grounds, we chose to survey the sampling unit of a mother-daughter dyad.

After obtaining ethics board approval, a convenience sample of 152 Turkish university-age women studying at a large state university in North Cyprus was recruited (using announcements in online student communities and in classrooms, and via a stand in the student common area) to participate in the research in exchange for a small gift (a cafeteria meal ticket). As one of the selection criteria for the sample, each daughter participant was requested to provide her mother's email address, and an email invitation with a link to the online version of the questionnaire was emailed to the mother. To secure high response rates from mothers, reminder emails were sent once a week if they had not yet completed the questionnaire. Out of 152 invitations, 146 completed questionnaires were returned from mothers, resulting in a response rate of 96.05% and 146 mother-daughter dyads (a total of 292 individual responses).

While filling out the questionnaires, first participants indicated their level of agreement on 5-point Likert scales (1 = "Strongly disagree" to 5 = "Strongly agree") to questions regarding SCAs and behaviors, as well as subjective knowledge. Next, they were asked to predict their partners' level of agreement for the same questions. Finally, they filled out questions related to PI (only completed by daughters), self-reported communication (completed by daughters

and mothers), control variables, demographics, and they were thanked for participation.

For daughters, 71.2% were 18–23 years old, with the remaining 28.8% ranging between 24 and 30 years old; 88.4% of daughters were studying for a bachelor's degree, and 11.6% were graduate students. Among mothers, 49.3% were in the range of 40–49 years old, and 44.5% were high school graduates. Additionally, 68.5% of mothers had at least two or more children. Both for daughters and mothers, the modal annual family income (45.2%) ranged from 50,000 to 100,000 TL (approximately 5800–11,600 USD).

4.3 | Measures

4.3.1 | Dependent variables

The agreement between daughters and mothers on the topic of SCAs and behaviors is the main dependent variable and is treated as the degree of intergenerational similarity (i.e., proximity) across daughters' and mothers' responses. We calculated the raw agreement level as the absolute value of differences between the daughter's response and the mother's response. Subsequently, we generated agreement scores for every dyad by summing the absolute value of differences acquired from each scale item. Next, we summed agreement scores of each dyad and divided it into the sample size to estimate a final raw mean agreement score for both constructs: SCAs and SCBs. Logically, lower raw means signify higher IG similarity, working with absolute differences in line with Chaffee and McLeod (1968).

We infer the direction of IGI as follows. For a given item in constructs of attitudes and behaviors, we calculate the item prediction accuracy score for each dyad member by taking absolute differences between the participant's prediction (i.e., predicted response) and partner's answer (i.e., real response). We then sum item prediction accuracy scores to have the total prediction accuracy score (TPAS) and divide it into the sample size to get the mean TPAS for attitudes and behaviors. By switching prediction positions of dyads and applying the same process, we obtain two different mean TPAS: one for the daughter's prediction accuracy, and one for the mother's, with lower mean scores indicating higher accuracy (as scores are based on absolute value differences). For each dyad, we then examine the ratio of daughter's TPAS to mother's TPAS. If the ratio is greater than one, we infer that IGI occurs from daughters to mothers, as recommended by the co-orientational model. If the ratio is less than one, the model suggests that influence occurs from mothers to daughters. In other words, the person who can more accurately state her dyad partner's cognitions is presumed to have been the recipient of the stronger influence. As a validity check on the co-orientational model's inference regarding the direction of influence, we asked participants whether they wish to follow their dyad partner's lead while engaging in sustainable consumption.

Our two constructs on SCAs and SCBs include items related to themes of sustainable transportation, sustainable giving, fair trade, sustainable product labels, green purchasing, water-air pollution,

energy conservation (e.g., electricity, natural gas, fossil fuel), waste reduction, recycling, reuse, and environmental concern. To cover this broad domain, fifteen items were adapted and modified. Items were adapted from various scales developed in prior research: socially responsible consumption behaviors scale (Antil, 1984), ecologically conscious consumer behavior scale (Roberts, 1996), fair trade subscale (Tanner & Wölfling Kast, 2003), socially responsible purchases and disposal scale (Webb et al., 2008), the GREEN scale (Haws et al., 2014), perceived consumer effectiveness on climate-friendly purchasing subscale (Feucht & Zander, 2017), and sustainable fashion consumption behaviors subscale (Song & Ko, 2017).

4.3.2 | Independent variables

Parent-child communication is the first independent variable. We assess the communication between daughters and mothers both objectively (observed communication) and subjectively (self-reported communication). Observed communication effectiveness relies on outcome measures of the communication between dyad members, using evaluation metrics such as the accuracy construct of the co-orientational model, to indicate the effectiveness of communication. Self-reported communication effectiveness relies on participant self-assessment, using scale items, to rate their perceived interpersonal communication in a dyadic relationship. Recognizing that learning may occur through indirect (e.g., observation, modeling) and direct processes during the course of interaction, and that communication may be both intentional and unintentional, we chose to employ both measurement approaches, in line with Moschis (1988) and Mandrik et al. (2018). Moreover, by measuring self-reported communication, we attempt to validate the co-orientational model's prediction accuracy-based construct.

For observed communication, prediction accuracy scores of daughters and mothers were summed to create an overall observed communication measure. According to the co-orientational model, higher prediction accuracy indicates that dyad partners know more about what the other thinks, suggesting that some form of effective communication must have taken place between partners. To measure subjective communication, a self-report scale comprised of four items was used, based on the parent-adolescent communication scale (Barnes & Olson, 1985) and the subjective communication scale (Mandrik et al., 2018). An overall subjective communication score for the dyad was processed by adding the daughter's and mother's subjective communication scores.

Peer influence is the second independent variable. We study the PI construct by examining a personality trait of daughters linked to peer conformity, as in previous empirical research (Mandrik et al., 2005; Meyer & Anderson, 2000). Accordingly, we used six appropriate questions from the attention to social comparison information (ATSCI) scale (Lennox & Wolfe, 1984). ATSCI reflects the extent to which people look to others for cues on how to behave. In the context of this study, we note that peers are the relevant others for college-age daughters living away from their families.

Lastly, subjective sustainable consumption knowledge (SSCK) was assessed by modifying four items from Flynn and Goldsmith (1999). The original subjective knowledge scale created by Flynn and Goldsmith (1999) includes adaptable measures for assessing knowledge of different types of consumer behaviors. In our modified version, both daughters and mothers were asked to indicate their agreement level to items such as “I think I know enough about green products to feel confident when I make a purchase.” A summary of measures used in this study appears in Appendix A.

5 | RESULTS

5.1 | Validity and reliability

IBM SPSS Statistics and AMOS V25.0 were used to code and analyze the current data. To test the validity of constructs, confirmatory factor analysis (CFA) was performed originally. We conducted CFA to see the overall fit between our data and measurement model as well as to lay the foundation for testing discriminant and convergent validity. Every construct was treated as a separate measure in the CFA and each observed variable was connected to its respective latent variable. We formed two hypothetical measurement models simultaneously: one for daughters and one for mothers. Overall fit indices of daughters' model were as follows: GFI = 0.97, CFI = 0.93, RMSEA = 0.016, $\chi^2/df = 2.93$, $p > .05$. For mothers, these same were: GFI = 0.96, CFI = 0.94, RMSEA = 0.019, $\chi^2/df = 2.90$, $p > .05$. Results indicate a good fit between data and two measurement models. Furthermore, all standardized factor loadings were found to be higher than the threshold limit of 0.60 (Hair et al., 2010) and were significant at $p < .001$ for both models. This denotes that observed variables located in daughters' and mothers' models significantly explained the variance of their respective latent constructs.

Following the recommendations of Awang (2014), discriminant validity was tested, where covariance paths were drawn between latent variables to show correlations between two exogenous constructs. For both models, correlations between any two constructs did not surpass the cutoff limit of 0.85 and ranged between (–.21, .64), indicating that our constructs did not suffer from serious redundancy and multicollinearity problems. Next, standardized factor loadings obtained in CFA models were used to assess the convergent validity and composite reliability (CR). As a rigorous measure of the convergent validity, the average variance extracted (AVE) scores were computed in parallel with Fornell and Larcker (1981). For all constructs, the AVE scores of daughter participants ($N = 146$) ranged between 0.51 and 0.74, and CR scores varied from 0.80 to 0.92. Similarly, mothers' ($N = 146$) AVE scores fluctuated between 0.53 and 0.82 and CR scores were in the range of 0.82 and 0.94. These results show the convergent validity and CR of all constructs at an adequate level, exceeding the minimum limits of $AVE \geq 0.50$ and $CR \geq 0.70$, suggested by Hair et al. (2010).

Further, we performed an attention check using a control question that measures the importance of sustainability for

participants. We examined if it positively correlates with our attitude and behavior constructs. Our analysis showed that this measure was positively associated with participants' self-reported SCAs and SCBs. Strong effect sizes observed both for daughters ($r = .470$, $p < .01$) and mothers ($r = .383$, $p < .01$). Taken together, these findings help us to establish an appropriate nomological network, giving us confidence that our constructs are represented with reasonable validity by our measures.

In total, five multi-items scales were used in this study. To assess internal consistency, Cronbach's α was reported for each scale. For daughters, α values were as follows: SCAs(α_D): 0.84, SCBs(α_D): 0.85, SSCK(α_D): 0.79, PCC(α_D): 0.90, PI(α_D): 0.90. For mothers, α values of SCAs(α_M): 0.85, SCBs(α_M): 0.86, SSCK(α_M): 0.81, PCC(α_M): 0.93 were observed, respectively. All α coefficients were found to be higher than the cutoff value of 0.70 for each construct, showing an acceptable level (Nunnally, 1978).

5.2 | Common method and nonresponse bias

Common method bias can lead to Type I and II measurement errors by inflating the relationship among constructs in survey research (e.g., Podsakoff et al., 2012). Since variables were measured from parent–child dyads (i.e., different type of respondents), the possibility of a common method bias was significantly reduced in this study as in Singh et al. (2020, p. 114). Nonetheless, we accounted both for the common latent factor technique and Harman's one-factor test (Harman, 1976) by following the recommendations of MacKenzie and Podsakoff (2012) to assess if common method bias exists. Employing the common latent factor approach, all measures were combined into a single factor to run CFAs for both daughters data (CFI = 0.64, GFI = 0.71, RMSEA = 0.22) and mothers data (CFI = 0.54, GFI = 0.62, RMSEA = 0.17). These poor fit index results indicate no threat for common method variance, as hypothesized models do not fit the data. For both datasets, we also ran CFAs with and without the presence of common latent factors by comparing differences in standardized regression weights. The differences were too small, not exceeding the 0.20 threshold (Cohen, 1988), which indicates no evidence of common method bias with this approach. In addition, Harmon's one-factor test was checked by running two exploratory factor analyses with unrotated factor solutions. All variables were loaded into a single factor to identify the common method variance. This single factor explained total variance of 0.25 for daughters data set and 0.34 for mothers, showing no risk of common method bias, as the total variance did not exceed the cutoff limit of 0.50 (Hair et al., 2010).

For nonresponse bias, only mothers posed a risk, as data was gathered from them in multiple waves during one month (daughters data were collected all at once). Potential nonresponse bias was checked using Levene's homogeneity of variance test. We classified 96 mothers as “early participants” who responded within one week, and 50 as “late participants” who responded from one to four weeks later. Levene's test for all constructs was not significant ($p > .05$),

indicating homogeneity of variance in measures, and no significant differences were observed between means of early and late participants. This outcome shows no existence of nonresponse bias for mothers.

5.3 | Hypothesis testing

5.3.1 | Normality tests and testing Hypothesis 1

Hypothesis 1 deals with the existence of intergenerational similarity on SCAs and behaviors. To examine this hypothesis, we tested the raw level of IG similarity between daughters and mothers against the nominal effect via the nominal dyad method (Mandrik et al., 2005). This method is an advancement in IG analysis of consumer attitudes and behaviors, specifically suitable for dyadic analysis. Used in previous IG research (Mandrik et al., 2005, 2018; Schindler et al., 2014), it creates a mean agreement score (i.e., nominal effect) of randomly paired daughters–mothers, which essentially represents the background similarity that may arise from reasons unrelated to IGI. This study is the first to use the nominal effect as a benchmark for testing the scope of IGI on sustainable consumer attitudes and behaviors.

As a first step, following the approach of Mandrik et al. (2005), nominal dyads were constructed via a macro tool in Excel, and 250 iterations of random pairings were performed to create grand means of nominal effect values of the SCAs and SCBs. Afterward, two normality tests were conducted for each construct to analyze if nominal effects are normally distributed (detailed results appear in Appendix B). Kolmogorov Smirnov normality tests were not significant ($p > .05$) for both constructs and kurtosis/skewness values fell within acceptable limits of normality: $(-2,2)$ (George, 2011) and remained relatively small. This indicates that distributions of nominal effects should be regarded as normal, verifying our randomization results to be applied in further hypothesis analysis.

To test Hypothesis 1, an analysis of variance was carried out in an attempt to compare differences among nominal effects and raw similarity mean scores (see Table 2). Significant differences between nominal effects and raw means were observed, for SCAs, $t(145) = 2.95$, $p < .01$, as well as for SCBs, $t(145) = 3.14$, $p < .01$. Therefore, as the raw intergenerational agreement between daughters and mothers was significantly greater than the nominal effects for both constructs, Hypothesis 1 is supported. To compare levels of mother–daughter similarity for individual sustainable consumption attitudes and behaviors used in our summary SCA and SCB measures, we also report descriptive statistics and correlations on an item-by-item basis (see Table 2). Significant effect sizes were observed for each item after accounting for nominal effects, providing convincing evidence for the presence of intergenerational similarity. Notably, correlations were stronger for behaviors such as caring for air pollution by utilizing sustainable transportation modes, recycling actions, energy conservation, and paying attention to fair trade labels.

As in previous research (Mandrik et al., 2005), we additionally tested nominal effects against zero to demonstrate the value of using the nominal dyad method. It was revealed that nominal effects were significantly greater than zero for both constructs ($t(145)_{SCAs} = 451.09$, $p < .00$; $t(145)_{SCBs} = 675.43$, $p < .00$). In light of previous research that used zero as a reference point while testing IG similarity (Heckler et al., 1989; Woodson et al., 1976), these results clearly demonstrate that the nominal effect is a more robust baseline for measuring IGI.

5.3.2 | Testing Hypothesis 2 and Hypothesis 3

Hypothesis 2 predicts that intergenerational agreement between daughters and mothers is positively related to communication effectiveness, and Hypothesis 3 expects that this intergenerational agreement is negatively related to PI on daughters. To test these hypotheses, we ran two multiple regressions with the enter method using raw similarity and prediction scores in both regression models for the sake of simplicity (as in Mandrik et al., 2005). In the first model ($F(3,145) = 18.46$, $p < .00$), mother–daughter similarity of SCAs was the dependent variable and PI, self-reported communication, and observed communication were explanatory variables, with 26% (R^2) of the variance in SCAs captured by the three explanatory variables. In the second model ($F(3,145) = 42.98$, $p < .00$), the mother–daughter similarity of SCBs was the dependent variable, with the same explanatory variables as in the first model. Compared to the first model, three explanatory factors were far better at predicting the dependent variable, SCBs, with an R^2 of 46%. Multicollinearity was not an issue in either model, as collinearity tolerances were greater than .80 and VIFs varied between 1.02 and 1.26, within acceptable limits (Hair et al., 2010).

For the effect of daughter–mother communication, both self-reported and observed communication was positively related to IG similarity of SCAs ($\beta = .20$, $t\text{-value} = 2.55$, $p < .01_{\text{self-reported communication}}$; $\beta = .33$, $t\text{-value} = 4.55$, $p < .00_{\text{observed communication}}$) and SCBs ($\beta = .20$, $t\text{-value} = 3.06$, $p < .00_{\text{self-reported communication}}$; $\beta = .59$, $t\text{-value} = 9.62$, $p < .00_{\text{observed communication}}$). These findings demonstrate that greater communication effectiveness leads to a higher level of IG similarity between daughters and mothers and, hence, Hypothesis 2 is supported. Further, PI was negatively related to mother–daughter similarity for SCAs ($\beta = -.23$, $t\text{-value} = -2.99$, $p < .00$) and SCBs ($\beta = -.18$, $t\text{-value} = -1.99$, $p < .05$), indicating an adverse effect of peers on IGI, and providing support for Hypothesis 3. Details of regressions are presented in Table 3.

5.3.3 | Testing Hypothesis 4 and supporting the research question

Hypothesis 4 concerns the existence of reverse IGI, occurring from daughter to mother. Initially, pairwise differences of the mother–daughter dyad were checked after accounting for normality

TABLE 2 The intergenerational similarity between mothers and daughters

Constructs (# of items)	Mean (SD)		Raw M-D similarity		Nominal M-D similarity		Nominal versus raw Similarity		Nominal versus zero similarity		Raw versus nominal correlations		
	M	D	Mean (SE)	Mean (SE)	Mean (SE)	Dif.	F value	t value	t value	t value	$r_{\text{raw(M-D)}}$	$r_{\text{nominal (M-D)}}$	Z value
Sustainable consumer attitudes (7)	4.03 (.63)	4.18 (.52)	3.71 (.24)	4.42 (.01)	4.42 (.01)	.71	8.73**	2.95**	451.09**	451.09**	.374**	.055	2.85**
Sustainable consumer behaviors (8)	3.66 (.67)	3.84 (.59)	5.53 (.28)	6.41 (.01)	6.41 (.01)	.88	9.87**	3.14**	675.43**	675.43**	.307**	.091	1.91*
Items (scale)													
Importance of decreasing consumption to minimize environmental impacts (SCA1)	4.15 (1.01)	4.22 (.77)	2.89 (.18)	4.61 (.01)	4.61 (.01)	1.72	91.30**	9.55**	471.24**	471.24**	.378**	.057	2.88**
Importance of using eco-friendly products (SCA2)	4.10 (1.04)	4.32 (.65)	3.76 (.23)	4.69 (.01)	4.69 (.01)	.93	16.34**	4.04**	492.76**	492.76**	.333**	.130	1.82*
Concern about wasting planet's resources (SCA3)	4.14 (1.07)	4.40 (.69)	3.99 (.21)	4.65 (.01)	4.65 (.01)	.66	9.85**	3.13**	483.31**	483.31**	.197*	.003	1.66*
Efforts to consume less and care for future generations (SCA4)	4.03 (.96)	3.95 (.92)	4.03 (.07)	4.71 (.01)	4.71 (.01)	.68	92.48**	9.61**	497.10**	497.10**	.267**	.078	1.65*
Describing herself as environmentally responsible (SCA5)	4.01 (1.07)	4.18 (.62)	4.11 (.14)	4.88 (.02)	4.88 (.02)	.77	30.09**	5.48**	246.68**	246.68**	.435**	.071	3.30**
Feeling responsibility for small growers and workers in lower-income countries (SCA6)	3.73 (1.10)	3.92 (.90)	2.99 (.28)	4.96 (.01)	4.96 (.01)	.97	49.43**	7.03**	496.12**	496.12**	.382**	.082	2.70**
Believing in sustainable product labels (SCA7)	4.07 (.98)	4.34 (.74)	4.76 (.10)	5.63 (.02)	5.63 (.02)	.87	72.77**	8.53**	283.95**	283.95**	.345**	.024	2.83**
Energy conservation (SCB1)	3.90 (1.10)	4.02 (.90)	4.32 (.21)	4.95 (.02)	4.95 (.02)	.93	8.91**	2.98**	248.12**	248.12**	.318**	.132	1.66*
Selecting less water-polluting products (SCB2)	3.83 (.97)	4.01 (.80)	5.91 (.10)	6.75 (.03)	6.75 (.03)	.84	70.56**	8.40**	227.24**	227.24**	.267**	.059	1.81*
Recycling behaviors (SCB3)	3.83 (1.04)	4.07 (.88)	3.77 (.29)	4.91 (.01)	4.91 (.01)	2.14	15.45**	3.93**	503.82**	503.82**	.390**	.088	2.73**
Buying products made by recycled materials (SCB4)	3.42 (1.04)	3.62 (1.01)	4.15 (.17)	4.90 (.01)	4.90 (.01)	.76	19.39**	4.40**	501.03**	501.03**	.273**	.015	2.24*
Caring for air pollution by choosing sustainable transportation options (SCB5)	3.54 (1.17)	3.91 (.98)	3.97 (.13)	4.57 (.01)	4.57 (.01)	.60	21.30**	4.60**	457.53**	457.53**	.391**	.027	3.26**
Clothing donation (SCB6)	4.01 (1.02)	4.17 (.95)	3.91 (.19)	4.63 (.02)	4.63 (.02)	.72	14.36**	3.78**	231.96**	231.96**	.287**	.080	1.81*

TABLE 2 (Continued)

Constructs (# of items)	Mean (SD)		Raw M-D similarity		Nominal M-D similarity		Nominal versus raw Similarity		Nominal versus zero similarity		Raw versus nominal correlations	
	M	D	Mean (SE)	Mean (SE)	Mean (SE)	Dif.	F value	t value	t value	t value	$r_{nominal}$ (M-D)	Z value
Willingness to pay higher prices for sustainable products (SCB7)	3.41 (1.03)	3.55 (1.01)	5.32 (.21)	6.57 (.04)	1.25	1.25	35.35**	5.94**	165.17**	.249**	.048	1.74*
Paying attention to fair trade labels (SCB8)	3.38 (1.05)	3.44 (1.12)	5.78 (.32)	6.81 (.03)	1.03	1.03	10.35**	3.21**	229.35**	.332**	.033	2.63**

Note: Scale: 5-point scale where a higher number means a more favorable attitude or behavior (for first two column); Raw and nominal M-D similarity mean scores are based on the absolute value of differences where a lower number means a higher agreement/similarity (for third and fourth column).

Abbreviations: D, daughters; Dif., mean differences between nominal and raw M-D similarity; M, mothers; SD, standard deviation; SE, standard errors.

*Significant at $p < .05$.

**Significant at $p < .01$; $N = 146$ (unit of analysis: dyads).

TABLE 3 Effects of peer influence, self-reported communication, and observed communication

Explanatory variables	First model (N=146 _{dyads})						Second model (N=146 _{dyads})									
	Dependent variable			Sustainable consumer attitudes (raw M-D similarity)			Dependent variable			Sustainable consumer behaviors (raw M-D similarity)						
	β	SE	t-value	Sig. (p)	F-value sig. (p)	VIF	Collinearity tolerance	R^2	β	SE	t value	Sig. (p)	F-value sig. (p)	VIF	Collinearity tolerance	R^2
Peer Influence	-.23	.04	-2.99	.00	.82	1.20	.82	.26	-.18	.04	-1.99	.05	.83	1.20	.83	.46
Self-reported Communication	.20	.04	2.55	.01	.80	1.26	.80	.20	.20	.04	3.06	.00	.82	1.22	.82	.46
Observed Communication	.33	.04	4.55	.00	.95	1.05	.95	.59	.59	.04	9.62	.00	.98	1.02	.98	.46

assumptions. Paired sample *t*-tests for the SCA and SCB scales showed that daughters had more favorable attitudes ($M_D = 4.18$, $SD = .52$ vs. $M_M = 4.03$, $SD = .63$) ($t(145) = 2.21$, $p < .02$) and behaviors ($M_D = 3.84$, $SD = .59$ vs. $M_M = 3.66$, $SD = .67$) ($t(145) = 2.43$, $p < .01$) than mothers, displaying an initial signal of reverse flow. To test Hypothesis 4, we conducted *t*-tests, comparing TPASs of daughters and mothers for SCAs and SCBs independently. The *t*-test results for both SCAs, $t(145) = 7.02$, $p < .001$ and SCBs, $t(145) = 6.14$, $p < .001$ were significant. Noticeably, mothers have higher prediction accuracy (lower mean) scores than daughters for both constructs. According to the co-orientational model framework, this indicates that IGI is mainly happening from daughter to mother. Results are shown in Table 4.

To further investigate this result, we performed an alternative analysis in a post-hoc fashion, depicted in Figure 2, in which we compared differences between three group means, each indicating the percentage of cases where prediction accuracy scores of daughters are larger than, equal to, or lower than mothers ($D < M$, $D = M$, $D > M$). This group comparison reaffirms that daughters are less able to predict the mother's cognitions regarding SCAs and SCBs, with the difference in proportions (72.6% vs. 22.6%) is significant ($Z = 8.55$, $p < .001$), providing support for Hypothesis 4.

Next, we analyzed two control questions of the study to hypothetically justify the co-orientational model's inferences regarding the direction of influence. Mothers indicated a greater wish to follow their daughters' lead in the sustainable consumption context ($M_M = 4.13$, $SD = .84$) than daughters' wishing to follow their mother's lead ($M_D = 2.72$, $SD = 1.24$), with the difference in means significant, $t(145) = 11.37$, $p < .00$. This result shores up the previous findings and provides a validity check on the co-orientational model approach.

A final insight into Hypothesis 4 is derived from the research question posed earlier: Does subjective knowledge of sustainable consumption play a part in determining the direction of intergenerational influence? To investigate this question, we developed a novel match/mismatch approach (see Table 5), demonstrating the role of subjective knowledge. Our analysis was stimulated by the idea of data triangulation (Carter et al., 2014) most often used in social science research. Triangulating across different quantitative approaches helped us to complete the nomological network supporting the co-orientational model constructs.

As in Table 5, we calculated total subjective knowledge scores of the mother and daughter for each dyadic relationship and obtained three different outcomes in which daughters have higher knowledge scores, mothers have higher scores, and both have equal scores ($D > M$, $D = M$, $D < M$) and listed these outcomes under Case 1. While in Case 2, we used the TPAS of the mother and daughter and generated three different outcomes (i.e., cases in which daughters have larger, equal, or lower prediction scores than mothers). Afterward, we checked whether Cases 1 and 2 report the same outcomes: (" $D > M$) = ($D > M$)", " $(D = M) = (D = M)$ ", " $(D < M) = (D < M)$ ". If both cases report the same result, we verified it as a match (1); if not, we labeled it as a mismatch (0). Ultimately, 86 matches (58.9%) and 60 mismatches (41.4%) were uncovered in the current dyadic data. The difference between proportions of matches and

TABLE 4 The direction of intergenerational influence

Constructs (# of Items)	TPAS _(D) Mean (SE)	TPAS _(M) Mean (SE)	Difference	TPAS _(D) versus TPAS _(M)	
				t-value	Sig. (p)
SCAs (7)	5.85 (.30)	3.17 (.22)	2.68	7.02	.00
SCBs (8)	7.54 (.34)	4.82 (.27)	2.72	6.14	.00

Note: TPAS indicates total prediction accuracy scores; Lower mean scores imply higher prediction accuracy for a given construct as mean scores are based on the absolute value of differences; $N = 146$ (unit of analysis: dyads).

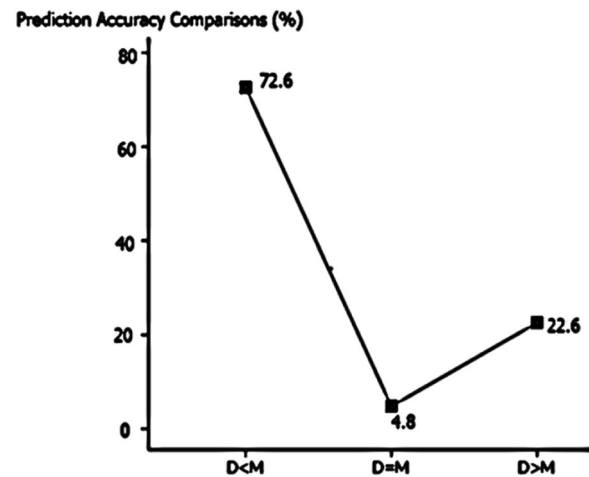


FIGURE 2 Prediction accuracy comparisons for attitudes and behaviors

mismatches (58.9% vs. 41.4%) is significant, $Z = 3.04$, $p < .01$, indicating that the direction of IGI is predominantly from the dyad member with higher subjective knowledge. Findings are congruent with a *t*-test, where daughters ($M_D = 3.78$, $SD = .72$) reported greater subjective knowledge scores than mothers ($M_M = 3.35$, $SD = .77$), $t(145) = 4.92$, $p < .00$. All in all, we conclude that subjective knowledge plays a role in determining the direction of IGI.

6 | GENERAL DISCUSSION

6.1 | Intergenerational similarity on sustainable consumption

This study adds to the growing body of research in sustainable consumer socialization. It is the first to demonstrate the existence of IGI on sustainable consumption among Turkish consumers (i.e., mothers and young-adult daughters). Additionally, it goes beyond early literature efforts (e.g., Ando et al., 2015; Casaló & Escario, 2016; Grønhoj & Thøgersen, 2009; Matthies et al., 2012; Meeusen, 2014) by documenting intergenerational effects on a wider set of SCAs and behaviors. In the ambit of sustainable consumption, the present study also

TABLE 5 Comparison of subjective knowledge and total prediction accuracy scores

ID of dyads	M _{SSCKscore}	D _{SSCKscore}	Case 1	M _{TPAS_{SCAs}-SCBs}	D _{TPAS_{SCAs}-SCBs}	Case 2	Matches (Case 1 = Case 2)	Mismatches (Case 1 ≠ Case 2)
Dyad 1	11	16	D > M	17	9	M > D		0
Dyad 2	12	17	D > M	10	11	D > M	1	
Dyad 3	14	19	D > M	12	14	D > M	1	
Dyad 4	12	19	D > M	12	10	M > D		0
Dyad 5	15	20	D > M	10	4	M > D		0
... (cont.)
Dyad 146	13	15	D > M	5	17	D > M	1	
Percentage of matches and mismatches							58.9%	41.1%

advances past efforts by employing a more valid quantitative measure of actual intergenerational similarity which controls against stereotype accuracy (Cronbach, 1955) and other extraneous effects on measured similarity, rather than simply reporting observed raw effects which tended to overstate IGI (Mandrik et al., 2005; Moore et al., 2002; Viswanathan et al., 2000). However, it must be noted that both the nominal and simple agreement methods are subject to measurement error and psychological biases which may affect responses of both generations, potentially causing an underestimation of IGI.

Comparable to past studies (Grønhøj & Thøgersen, 2009, 2012; Katz-Gerro et al., 2020; Leppänen et al., 2012; Meeusen, 2014) which generally reported small to moderate effects, we found relatively larger IG effect sizes both for attitudes and behaviors. Strictly speaking, intergenerational agreement between dyad partners was significantly higher for attitudes. Additionally, overall mean attitudes of mothers and daughters were significantly higher than mean behaviors. From these findings, it appears that dyads are less likely to influence each other's actual behaviors in the attitude-behavior translation process. This might signify a generational gap as in Grønhøj and Thøgersen (2009) and the existence of other influential factors. Nonetheless, PCC and PI constructs were successful in explaining a significant amount of variance in attitudes and behaviors.

6.2 | PCC and intergenerational influence

In this study, both self-reported and observed PCC strengthened the IG transfer and had positive explanatory power, yet effect sizes of observed communication were much stronger than self-reported communication. As opposed to attitudes, it appears that PCC about actual behaviors has greater positive effects on IG similarity. This finding is in line with Meeusen's (2014) study in which stronger communication patterns increased the effectiveness of IG transmission in Belgian families, nearly doubling the explained variance in the test model. However, Meeusen (2014) measured intra-family communication about the environment using a single item, so low content validity may limit its ability to capture the entire communication construct. We overcome this limitation by benefiting from the added validity of a multi-trait, multi-method

approach. Among other things, this is the first demonstration of a triangulated result that supports the communication effectiveness construct of the co-orientational model in this domain.

Innately, the curiosity of family members related to sustainable consumption may not be equally distributed. At first glance, one may be more concerned or involved in the topic than the other. In our case, it seems daughters, possessing greater knowledge of sustainability, are perhaps more likely to communicate their positions with mothers, either directly or indirectly. Of course, this may differ depending on the cohesion and connectedness between them. A comprehensive examination is still necessary to determine which factors may play a role in the initiation of PCC about sustainable consumption. In future investigations, specifying measures of self-reported communication by including additional assessment items such as "amount of time daughters and mothers spent together" may provide superior insights into how communication frequency affects IG similarity.

6.3 | PI and intergenerational influence

Past studies (Grønhøj & Thøgersen, 2009, 2012; Meeusen, 2014) initiated this line of inquiry, inviting researchers to investigate other possible socialization agents in the transmission process of sustainable consumption. We answered this call by examining PI, demonstrating that peer conformity on daughters is negatively associated with mother-daughter IG similarity. This is in parallel with Meyer and Anderson (2000) and Mandrik et al., (2005, 2018) who observed that parental influence decreases with the increasingly prominent role of peers in young adult daughters' lives. Even though not directly reported at this juncture, our data was also signaling a positive association between peers' and daughters' sustainable behaviors. Therefore, it is plausible to assume that they may share some common interests (Collado et al., 2017) in the development of pro-environmental consumer identity. In that sense, peers may directly encourage—or even discourage—them to engage in specific sustainable consumption behaviors (e.g., Moore et al., 2002). As Thøgersen (2006) highlights, peers may even try to put social pressure on their counterparts. Indeed, this commonality may derive from the existence of sustainability-related

facilities in the college environment which contribute to the learning process of sustainable consumption acts between peers and their counterparts, such as participation in sustainability clubs, a relatively common fixture on campuses around the world. From this angle, daughters may choose to imitate their peers more than their mothers, a speculation congruent with White et al. (2019), which confirmed the positive effect of pro-environmental ingroups on sustainable actions of individuals.

6.4 | Reverse intergenerational influence

This study makes unique contributions to our understanding of environmental reverse socialization. As aforementioned, early literature suffered from using raw correlation measures alone to ascertain the direction and called for methodological enhancements (Grønhoj & Thøgersen, 2009, p. 419). The traditional co-orientational model framework helped us to quantify IG effects and provided a clear demonstration that IGI in the sustainable consumption domain is not necessarily always from parents to children. In the present study, daughters were shown to exert a greater influence on mothers. Keeping methodological and theoretical differences aside, these findings are consistent with Ekstrom's (2007), Grønhoj's (2007), Gentina and Muratore's (2012), and Singh's et al. (2020) empirical efforts on reverse socialization. Notably, reverse influence in the sustainability domain has been illustrated mostly by qualitative approaches; however, the current study helped to substantiate their findings in a quantitative setting. To our knowledge, the triangulation of quantitative results is a first effort to validate the co-orientational model's predictions in IG research.

From our findings, it would be logical to presume that daughters had greater exposure to sustainable consumption topics in their campus living environment. In parallel with Gentina and Singh (2015), this may be understood as resulting from the availability and frequent use of the internet, new media tools, peers, student clubs, course curricula, voluntary initiatives, and other situational affordances contributing to the adoption of sustainability knowledge present in their surroundings. During the course of interaction, mothers should see their daughters as an essential information source in sustainable consumption. This is reasonable to suggest, as the family is a dynamic social entity in which parents and children may mutually learn from each other (e.g., Easterling et al., 1995). In line with Şener and Hazer (2008), lack of environmental consciousness, inadequate sustainability education, and missing structural facilities among older generations in Turkey may explain why mothers are deficient in sustainability-relevant knowledge and choose to follow their daughters' vision. At this stage, these are just speculations, demanding attention in future investigations.

6.5 | Managerial implications

Intergenerational influence is a real marketplace phenomenon that warrants closer interest by practitioners, to take advantage of transmission effects (Moore et al., 2002). Documenting IG

mother–daughter similarity and reverse influence, marketers wishing to promote sustainable behaviors or sustainable brands may be well advised to consider a pull strategy approach via children to attract attention of parents. Indeed, daughters should be prioritized in the process of targeting and communicating sustainable marketing strategies as this may help not only to develop habits at early life stages, but to open a gateway to other household members. Localized exploratory surveys or zip clustering efforts may be used to identify environmentally responsible IG-prone dyads and most relevant trade regions or outlets to use green promotional strategies and develop sustainable product offerings, per the suggestion of Moore et al. (2002). To encourage sustainable consumption, retailers might consider offering special discounts on items (e.g., green cosmetics, ethical clothing) of interest to daughter–mother pairs to stimulate intra-family communication about intergenerational shopping. And while producers, such as organic farmers, help to promote environmentally oriented anticonsumption practices and alternative consumption systems (Dalmoro et al., 2020), they should keep in mind the important role played by younger generations in changing the consumption patterns of older ones.

It is recognized that millennial consumers (our sample group) progressively engage with social media (e.g., Facebook, Twitter, Instagram) as a primary tool to gather information about sustainability initiatives and environmentally friendly products (e.g., Bonera et al., 2020). Most recently, Güney and Sangün (2021) have shown the positive influence of the pandemic on sustainable consumption habits (e.g., organic food consumption, green buying, waste reduction) and environmental awareness of individuals in Turkey. Thus, the current swing towards online presents an opening for local marketing strategists to capitalize on intergenerational effects. It may therefore make sense to consider buzz marketing and umbrella branding strategies via digital channels to increase word of mouth and communication among youth, their friends, and their parents. And in the COVID-19 era of lockdowns around the globe, where the rising trend of environmentalism finds its place in digital settings (e.g., Chiu et al., 2020), marketers should mainly target young adult daughters through online channels, as social media marketing strategies gain prominence.

Young Turkish female consumers are more competent (as opposed to males) while engaging in sustainable consumption (Bulut et al., 2017), which further underscores the importance of targeting daughters for online pro-environmental campaign strategies. Ultimately, marketers should make efforts to explore the contexts in which certain products or brands are more prone to influence from either daughters to mothers or mothers to daughters, and which are more susceptible to PI. Such efforts may assist them to determine how much weight should be placed on peer versus parental influence (or reverse IGI) in developing marketing strategies.

6.6 | Limitations and future research

As in all survey research, the present study is not without limitations which provide abundant avenues for future research. One shortcoming

of our study lies in the specific age group of our daughter samples. IG effects and direction of influence may vary according to different age groups of daughters or mothers. As John (1999, p. 186) suggests, children go through different life stages (perceptual (3–7 years), analytical (7–11 years), and reflective (11–16 years)) in terms of cognitive development and information processing while growing to be a mature consumer. It is likely that both level and pattern of influence diverge along with these life phases. Furthermore, our data were cross-sectional and daughter subjects were selected from a specific university, which may lead to a self-selection bias. It should be noted that attitudes, behaviors, or even PI may vary among college students from different locales and with different backgrounds.

Still, the relatively substantial means of nominal effects: 4.42 (SCAs), 6.41 (SCBs) leave the door open for other constructs that may contribute to the sustainable consumer socialization process. From this perspective, future research may incorporate other socialization agents (e.g., mass media, school, religious groups, cultural groups, information technologies) and replicate this study to see whether IGI exists or differs according to regional variations, background differences (e.g., gender, education level, socioeconomic strata), or different dyad types in families. Certainly, longitudinal IG studies with larger sample sizes are needed to examine transmission effects on other sustainable orientations over extended periods. Even if there are several salient examples of cross-national sustainable IG research (e.g., Ando et al., 2015; Casalo & Escario, 2016; Katz-Gerro et al., 2020), more empirical dyadic studies in similar developmental settings, incorporating the nominal dyad method and the co-orientational model as a basis of comparison are called for. More critically, future research should focus on the IG transmission of specific behaviors which have been until now somewhat neglected (e.g., sustainable giving, fair trade, sustainable transportation choices). This may add to the robustness and generalizability of our empirical results.

Although we documented the role of subjective knowledge here, more detailed qualitative (e.g., in-depth interviews, focus groups) (Moore et al., 2002) and quantitative efforts are needed to shed light on other factors behind the process of reverse transfer. As one potential avenue, it would be fruitful to conduct a detailed systematic review of research with meta-analytic methods to pinpoint possible reasons behind the variation of IG effect sizes. As a departure point, a meta-analysis study may offer windows of opportunity to draw theoretical boundary conditions that delineate reverse influence in consumer behavior.

Collectively, the findings here are encouraging in that they point out the role of intergenerational cooperation in a developing country in which youth are playing a lead in helping to achieve a more sustainable society. Although we identify young adult Turkish daughters as potential change agents in the sustainable consumption domain, we should not leave all responsibility to them. Rather, negotiations between generations and the directive vision of private and governmental entities are necessary and must play central roles in the development and implementation of sustainable consumption initiatives.

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CONFLICT OF INTERESTS

The authors declare that there are no conflict of interests.

ETHICAL STATEMENT

This study has been approved by METU Northern Cyprus Campus Scientific Research and Publication Ethics Committee with the ethics approval number: BAYEK_01_10.

DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

ORCID

Oguzhan Essiz  <http://orcid.org/0000-0002-8976-7800>

Carter Mandrik  <http://orcid.org/0000-0003-3599-6664>

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APPENDIX A

Factor loadings are located in parentheses.

*Items reverse coded.

Sustainable Consumer Attitudes (SCAs) (7 items) (1 = strongly disagree; 5 = strongly agree)

1. It is important for me to decrease my consumption (use less or avoid buying products) to minimize impacts on the environment (.79_D, .64_M).
2. It is important for me that products I use do not harm the environment (.73_D, .78_M).
3. I am concerned about wasting the resources of our planet (.81_D, .79_M).
4. I show a serious effort to consume less to preserve our resources for future generations (.65_D, .68_M).
5. I would describe myself as an environmentally responsible person (.72_D, .71_M).
6. I feel a sense of responsibility for small growers and workers in lower-income countries that produce the things I buy (.64_D, .74_M).
7. I believe it is a good idea to introduce labels indicating the climate-friendliness of products (.82_D, .82_M).

Sustainable Consumer Behaviors (SCBs) (8 items) (1 = strongly disagree; 5 = strongly agree)

1. I limit my use of energy such as electricity, natural gas, fossil fuel consumption to reduce my harm on the environment (.80_D, .76_M).
2. I avoid buying products that pollute the water (.74_D, .75_M).
3. I recycle the materials I use (metals, papers, and plastics) (.63_D, .86_M).
4. I normally make a conscious effort to buy products from recycled materials (.78_D, .66_M).
5. I ride a bicycle or use public transportation to reduce the impact of air pollution (.82_D, .70_M).
6. I donate to charities clothes that I no longer wear (.73_D, .62_M).
7. I am willing to pay a higher price to buy environmentally friendly or sustainably sourced products (.64_D, .77_M).
8. When buying foods, I pay attention to “fair trade labels” indicating that people growing and working in food production are treated fairly (.71_D, .72_M).

Subjective Sustainable Consumption Knowledge (SSCK) (4 items) (1 = strongly disagree; 5 = strongly agree)

1. I am familiar with the concept of “sustainability” (.64_D, .69_M).
2. I think I know enough about green products to feel confident when I make a purchase (.71_D, .78_M).
3. I do not feel knowledgeable about sustainable consumption practices and sustainability overall* (.77_D, .72_M).
4. Compared to most other people, I think I know less about sustainable consumption practices and sustainability overall* (.74_D, .73_M).

Parent-Child Communication (PCC) (4 items) (1 = strongly disagree; 5 = strongly agree)

1. I can discuss my consumption-related beliefs with my mother without feeling restrained or embarrassed (.86_D, .88_M).
2. My mother and I really understand each other well (.87_D, .93_M).
3. Over the years, my mother and I have established good communication (.90_D, .96_M).
4. There has been open communication between my mother and me over time (.81_D, .85_M).

Peer Influence (PI) (6 items) (1 = strongly disagree; 5 = strongly agree)

1. My behavior often depends on how I feel others wish me to behave (.72_D).
2. It is my feeling that if everyone else in a group is behaving in a certain manner, this must be the proper way to behave (.81_D).
3. When I am uncertain how to act in a social situation, I look to the behavior of others for cues (.90_D).
4. If I am the least bit uncertain as to how to act in a social situation, I look to the behavior of others for cues (.93_D).
5. It is important to me to fit into the group I am with (.67_D).
6. I try to pay attention to the reactions of others to my behavior to avoid being out of place (.70_D).

Control Questions

1. Overall, I believe sustainability is extremely important.
2. I like to follow my mother's lead in the way she practices sustainable consumption.

3. I like to follow my daughter's lead in the way she practices sustainable consumption.

APPENDIX B

See Figure B1 for Histograms of nominal effects.

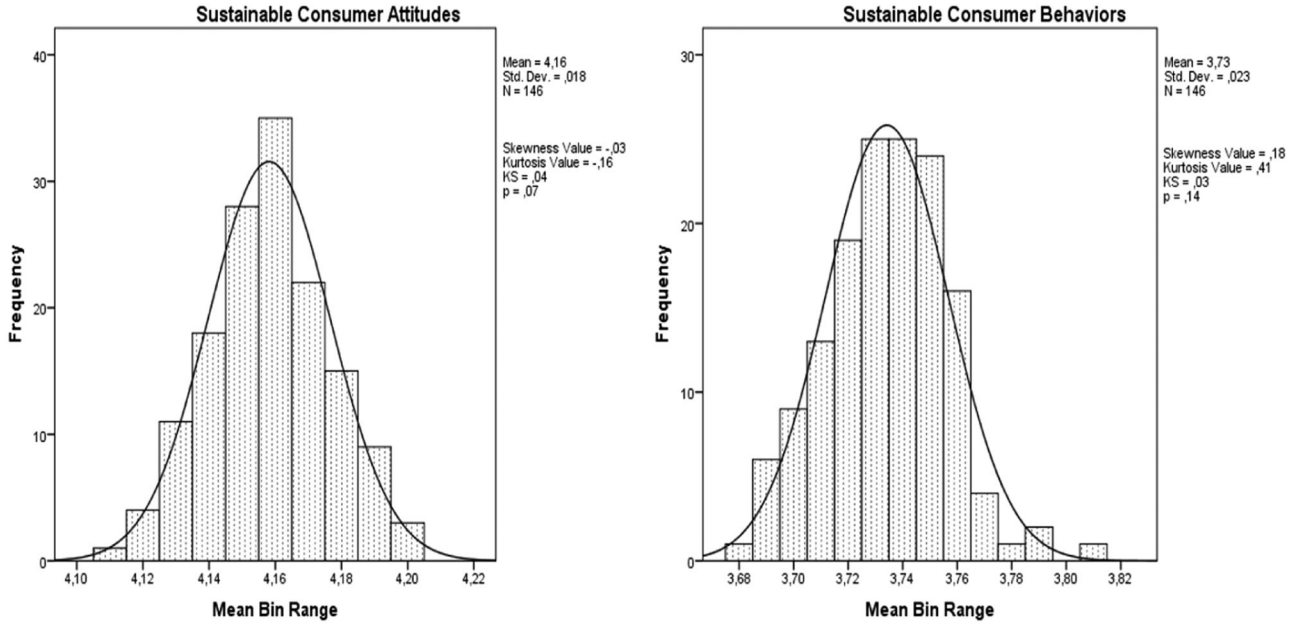


FIGURE B1 Histograms of nominal effects: Normality tests for SCAs and SCBs