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Intergenerational Transmission of Sustainable Consumption Practices: Dyadic Dynamics of Green Receptivity, Subjective Knowledge, Peer Conformity, and Intra-family Communication

Abstract

The urgent need to tackle climate change and encourage responsible consumption patterns within the framework of environmental management and sustainable development has amplified the significance of understanding how sustainable consumption practices are passed down through generations. The purpose of this research is to expand the understanding of the intergenerational transmission of sustainable consumption. Drawing upon consumer socialization theory, our study explores how sustainable consumer attitudes and behaviors are transmitted across generations, particularly within mother-daughter dyads in a collectivistic culture: China. Four factors—communication effectiveness, receptivity to green communication, green subjective knowledge, and peer conformity—are examined as potential influencers of the intergenerational transmission process, using the co-orientational model and the nominal dyad method. After quantifying dyadic raw agreement scores and accounting for nominal effects, the current findings reveal the presence of intergenerational similarity in sustainable consumer attitudes and behaviors and demonstrate that higher green receptivity, subjective knowledge, and intra-family communication between mothers and daughters enhances intergenerational agreement, while stronger peer conformity on daughters diminishes intergenerational transmission. Further, a significant reverse transmission effect from daughters to mothers was documented, underscoring the role of younger generations in promoting sustainable practices within families. Overall, this research sheds light on the intricate dynamics of sustainability practices in families. It also highlights the importance of intergenerational impacts in promoting sustainable consumption within dyadic relationships, providing valuable guidance for marketing managers seeking to leverage these dynamics.

Keywords: Sustainable consumer attitudes, Sustainable consumer behaviors, Green subjective knowledge, Peer conformity, Communication effectiveness. Receptivity to green communication, Intergenerational transmission.

Research Highlights

- The co-orientational model and nominal dyad method are used to quantify how sustainable consumer attitudes and behaviors are transmitted within mother-daughter dyads in China.
- The receptivity of dyads to green marketing efforts, their green subjective knowledge, and the effectiveness of their communication amplify intergenerational transmission.
- Peer conformity in dyads diminishes intergenerational transmission.
- Significant reverse transmission effects from daughters to mothers have been observed.

1. Introduction

As Peattie (2010) insightfully highlighted, our current consumption culture presents significant challenges due to its unsustainable impact on the global economy, cleaner production, and the environment. Thus, promoting green consumption emerges as a vital strategy not only to mitigate the environmental crisis but also to foster sustainable resource use (Trudel, 2019). The industry has caught onto this trend, increasingly adopting green consumption as a cornerstone of its strategic positioning and marketing efforts (Naciti, 2019). This widespread interest is mirrored in academic studies that seek to better understand the factors shaping sustainable consumer attitudes (SCAs) and behaviors (SCBs) across various demographics and contexts (Al Mamun et al., 2018; Ajibade & Boateng, 2021).

However, despite burgeoning interest and efforts, the bridge between sustainable attitudes and actual consumer behavior, the so-called attitude-behavior gap (ElHaffar et al., 2020; Peattie, 2010), remains narrow across different contexts—from organic food consumption and resource efficiency in Europe Aprile & Fiorillo, 2023; Schäufele & Janssen, 2021) to sustainable practices in Asian markets (Nguyen et al., 2019; Tseng et al., 2013). This observable inconsistency between proclaimed environmental values and practical purchasing behaviors (i.e., the value-action gap) presents a significant hurdle in achieving the United Nations' 2030 sustainable development goals (SDGs), particularly SDG 12, which advocates for cleaner production and consumption (Barta et al., 2023).

Understanding what drives this inconsistency is pivotal and prior studies have often focused on situational or contextual factors such as the availability and perceived effectiveness of products (Frank & Brock, 2018), or psychographic variables such as general risk aversion and subjective knowledge (Essiz et al., 2023). By exploring the critical role of family relationships and intergenerational transmission processes, we can uncover additional factors that influence sustainable consumption practices, thereby contributing to bridging the attitude-behavior gap in this domain (Park & Lin, 2020). Yet, several gaps in the past research on intergenerational transmission of sustainable consumption have been identified.

Firstly, research is scarce on dyadic intergenerational transmission, particularly in understanding the factors that influence the similarity or dissimilarity in sustainable attitudes, values, and behaviors passed between generations (Schimmack et al., 2002). Although there is a stream of research that studies the differences between generations (e.g., Cheben et al., 2022), there is limited research on the dyadic intergenerational transmission of sustainable consumption habits (Essiz & Mandrik, 2022). Our understanding is predominantly incomplete regarding the factors that either enhance or diminish intergenerational similarity in these areas. By identifying boundary factors, we can better understand how sustainability-oriented values and practices are passed between generations. Secondly, the process of reverse intergenerational transmission, where younger generations influence older ones, remains a critically understudied theme (Essiz & Mandrik, 2022), highlighting the need to comprehend the dynamic nature of reciprocal influence within families, especially concerning sustainability (Kwak, 2003). This aspect is crucial for understanding the disposition of attitude and behavior transmission in families, notably concerning sustainable consumption. Moreover, the impact of intergenerational influences (IGIs) in collectivistic cultures, including China, is an area that requires in-depth exploration to elucidate how societal values intersect with IGIs, particularly in the context of sustainability (Cui et al., 2022; Yang et al., 2024).

Methodologically, there is a need for enhancement in intergenerational research to move beyond reporting raw correlations and incorporate more robust testing methods. Here, the co-orientational model and the nominal dyad method are proposed as measurement advances to control for spurious effects (i.e., similarities that may arise from reasons unrelated to IGIs) and provide rigorous testing, ensuring the reliability and validity of research findings. By adopting a multi-trait, multi-method approach, researchers can strengthen the empirical testing of intergenerational transmission on sustainable consumption (Rabbanee et al., 2023). Much of the existing intergenerational research relies on simple correlation sizes to infer intergenerational similarity, which might lead to underestimations or overestimations of the actual effects. To address this methodological gap, our research incorporates the co-orientational model (Chaffee & McLeod, 1968) and the nominal dyad method (Mandrik et al., 2005). These approaches help control for spurious effects and provide a more rigorous testing method (Mandrik et al., 2018; Moore et al., 2002).

In addressing these gaps, the present study aims to build upon the consumer socialization theory (John, 1999) and contribute to the understanding of how a wide range of sustainable consumer attitudes and behaviors are transmitted across generations, particularly among mother-daughter dyads in a collectivistic culture: China. By integrating innovative methods and exploring additional dimensions of intergenerational transmission, our research seeks to provide valuable insights into the complex dynamics of sustainability practices within families and societies. It further explores the under-researched area of reverse intergenerational transmission, offering new insights into how younger generations can influence their parents' sustainability practices. In this regard, parent-child communication effectiveness, receptivity to green communication, green subjective knowledge, and peer conformity are investigated as potential influential factors of IGIs, and the direction of intergenerational transmission is quantified based on the predictions of co-orientational approach. Practically, outcomes of this research urge marketing managers by demonstrating how to capitalize on intergenerational effects to promote visible sustainable consumer practices within dyadic relationships.

The novel aspects of this study lie in its focused examination of dyadic dynamics (i.e., mother-daughter pairs) within a collectivistic culture, its exploration of reverse intergenerational transmission process, the incorporation of green receptivity, subjective knowledge, peer conformity, intra-family communication as multiple boundary factors, and the application of advanced methodological approaches like the co-orientational model and nominal dyad method. Combined, these elements distinguish this research from existing literature, providing new insights into the complex dynamics of sustainable consumer behavior transmission across generations.

From this outlook, this study adds to the consumer socialization theory (John, 1999) by exploring the under-researched area of sustainable consumption within intergenerational dynamics and enhances the understanding of the boundary factors that explicate the IG transmission process. By highlighting the reverse transmission effect from daughters to mothers, the research offers new insights into how sustainability practices can be influenced within families. Practically, the findings provide valuable guidance for marketing managers and policymakers aiming to leverage familial relationships to promote sustainable consumption behaviors, particularly in collectivist societies like China.

Overall, this paper is articulated as follows. First, we provide an overview of the extant literature and introduce our theoretical framework based on the consumer socialization theory prior to glancing at intergenerational influence on sustainable consumption. Then, we justify all the hypotheses that constitute our proposed research model. Subsequently, we detail the research methodology and display the results of the data analysis which are later discussed in light of the extant literature. We conclude with theoretical implications, managerial contributions, limitations, and suggestions for future research.

2. Literature review

2.1. Sustainable consumption: prior research on consumer attitudes and behaviors

In this research, we define sustainable consumer attitudes and behaviors in line with the fundamental view of Ajzen and Fishbein (2000) as a set of beliefs, feelings, intentions, and predispositions related to sustainable consumption. Consumers' consideration for the environment and commitment to environmentally friendly behavior is instrumental in generating a visible change towards sustainable consumption (Liu et al., 2012). Since environmental awareness (Han, 2020) seems to be a focal behavioral factor, the extant literature on sustainable consumption has generated insights into central issues such as social influence (Shen et al., 2020), individual motivations (Lin & Hsu, 2015), psychological influences

(Sidique et al., 2010), personality traits (Yazdanparast & Alhenawi, 2022), and ethical concerns related to sustainable self-identity and moral obligation (Chen, 2020).

Sustainable consumption behavior can be captured by largely looking at three dimensions such as the willingness to pay a premium price, the green purchase frequency, and the green purchase satisfaction (Dangelico et al., 2021). Prior studies have investigated the determinants of sustainable consumption behavior in various industries such as the luxury fashion industry (Essiz & Senyuz, 2024), hospitality (Han, 2020; Yarimoglu & Gunay, 2020), and the wood industry (Higgins et al., 2020), among others. This research stream revealed the importance of specific practices for consumers to be willing to pay more, including local manufacturing (Şener et al., 2019), recycling initiatives (Yarimoglu & Gunay, 2020), the use of eco-labels (Higgins et al., 2020), providing consumers with objective knowledge about products (Shao & Ünal, 2019), and focusing on businesses adopting large-scale green transition (Jørgensen et al., 2022; Le, 2022).

In a context that generates economic pressures on consumers such as the Covid-19 aftermath (Waliszewski & Warchlewska, 2021), the study of those determinants of sustainable consumption behavior is important to facilitate a green shift. Interestingly, the pandemic occasionally enhanced consumers' attention toward consumption practices that do not affect future generations negatively (Hüttel & Balderjahn, 2022) even though the higher prices of green products generated a difference between the attitude and the concrete behaviors (Qi et al., 2020). Indeed, prior studies confirmed the consistent link between attitudes and behaviors (Arslan, 2012), but other studies glanced at the empirical evidence of irregularities in this link (Young et al., 2010), often referred to as the "attitude-behavior gap" (Luchs et al., 2015) and the "value-action gap" (Essiz et al., 2023). For instance, Baby Boomers express positive attitudes concerning fair trade, but this does not convert into fair trade purchasing behavior (Benson & Connell, 2014). Hence, more research appears necessary to better understand the social factors, notably family-related accounts, that may influence the sustainable consumption process (Matthies & Wallis, 2015), to bridge the salient attitude-behavior gap (Peattie, 2010). In this vein, we contend that investigating intergenerational similarities in the consumption patterns of households is indeed worth exploring and requires looking at the family dynamics, notably how family members behave and influence each other.

2.2. Sustainable consumption across generations: from difference to influence

Prior research has explicitly indicated that consumers' age in terms of generation can explain sustainable consumption behaviors (Dabija et al., 2019). Based on the typology proposed by (Chaney et al., 2017), prior studies have confirmed that the adoption of sustainable behavior is more common for consumers from Generation Z than Baby Boomers, Generation X, and Generation Alpha (Dabija et al., 2019). The COVID-19 pandemic has had a more significant impact on Generation Y's shift toward sustainable consumption compared to the other generations (Severo et al., 2021). The motivation to engage in sustainable consumption behavior varies from generation to generation, with regard to energy efficiency (Wang et al., 2022), personal status (Johnson et al., 2018), and ecological consciousness (Sudbury Riley et al., 2012). Depending on the context, millennials sometimes show the highest levels of environmental concern (Heo & Muralidharan, 2019). These divergences in result can be explained by a difference in focus. For instance, Baby Boomers value more the environmentally friendly aspects, while the younger generations value more the ethical aspects (Barr et al., 2011). The generation to which the consumer belongs also has an impact on the preferred type of sustainable consumption such as smart retailing (Priporas et al., 2017), online shopping (Johnstone & Lindh, 2018), secondhand (O'Rourke & Lollo, 2015), and product sharing (Hwang & Griffiths, 2017), among others.

Although this stream of marketing literature on sustainable consumption documents generational differences, it does not show the influence of one generation on another by taking a dyadic analysis approach. The present research attempts to fill this void. In line with this, a stream of research drawing from the environmental psychology and education literature looked at sustainable family socialization and intergenerational transmission (Casaló & Escario, 2016; Gentina & Muratore, 2012; Katz-Gerro et al., 2020; Singh et al., 2020). Nonetheless, it is noteworthy that only a few studies adopted the perspective of consumer socialization theory (Katz-Gerro et al., 2020; Singh et al., 2020). As such, the family unit is often considered a central locus of sustainable socialization in which environmental consciousness (Essiz & Mandrik, 2022) and concern (Meeusen, 2014) is transmitted among family members. In addition to these values, specific sustainable behaviors are also conveyed within the family unit, notably recycling and re-use (Katz-Gerro et al., 2020), waste disposal (Ando et al., 2015), energy usage (Grønhøj & Thøgersen, 2009), and water saving (Essiz & Mandrik, 2022). Intriguingly, visible behaviors such as waste disposal are easier to transmit than less visible behaviors (Meeusen, 2014).

Akin to the literature on consumer socialization, the existing studies on intergenerational influence typically seek to understand the few determinants of the transmission of sustainable consumption among family members. For instance, prior studies highlighted the roles of family norms (Grønhøj & Thøgersen, 2012), parenting style (Grønhøj & Thøgersen, 2017), socialization style (Katz-Gerro et al., 2020), and gender specific patterns (Meeusen, 2014) as being crucial moderators of intergenerational transmission process. Except for these factors, receptivity to green communication, subjective knowledge, peer conformity, and parent-child communication received almost no attention, a gap we aim to bridge. Another factor is the age group of the children (Ando et al., 2015) which looks at how the parents influence their offspring in a top-to-bottom way. Yet, recent research also reported a reverse bottom-up influence, which requires further inquiry for our case to grasp how family members synchronize their consumption-related beliefs (Singh et al., 2020).

3. Theoretical background and hypotheses development

3.1. Consumer socialization theory

Consumer socialization perspective refers to the process through which young individuals (e.g., children) acquire skills, knowledge, and attitudes to navigate the marketplace effectively (John, 1999). It largely encompasses the transmission of value priorities, behaviors, and consumption-related attitudes from parents to children, facilitated by various socialization agents such as peers, mass media, and cultural influences (Moschis & Churchill Jr, 1978), among others. At its core, consumer socialization occurs through observational learning, modeling, and interaction with these agents, where family members, particularly parents, take pivotal roles as influential socialization agents (Gong et al., 2022). This theory underscores not only the acquisition of knowledge and skills but also the internalization of motives and values pertinent to consumption activities (John, 1999). As individuals progress through various stages of cognitive and social development, they transition from children to adult consumers, guided by the values and behaviors instilled during their upbringing.

Earlier employed in research on sustainable consumption, consumer socialization theory sheds light on adaptation of environmental attitudes and behaviors (Sotelo-Duarte & Gónzalez-Cavazos, 2023; Viswanathan et al., 2000). Research offers an inclusive examination of environmentally conscious behavior, considering motivation, abilities, and opportunities for action within the family context, highlighting the significant role of parents as primary socialization agents, mostly demonstrating positive correlations between parents' and young people's attitudes towards pro-environmental behavior (Gong et al., 2022; Katz-Gerro et al.,

2020; Lissillour et al., 2022). Furthermore, it reveals a generational gap in environmentally conscious behavior, suggesting an evolving landscape of sustainable consumption across generations (Grønhøj & Thøgersen, 2009). In this setting, consumer socialization theory provides a robust framework for our research in comprehending and predicting sustainable consumption patterns of parent-child dyads, ingrained in the intergenerational transmission of environmental values, attitudes, and behaviors.

3.2. Intergenerational influence on sustainable consumption

Intergenerational influence, namely, IGI, refers to the transmission of marketplace resources, beliefs, ideas, and preferences from one generation to the next both directly and indirectly (He et al., 2023; Moore et al., 2002). It has been studied and observed in a variety of contexts, including transmissions of social skills (Easterling et al., 1995; Essiz & Mandrik, 2022; Mandrik et al., 2005), political beliefs (Filimonau et al., 2023; Karanika & Hogg, 2016), family decision-making patterns (Cotte & Wood, 2004; Ekström, 2007), and daily consumer practices (Bailey et al., 2016; Shim, 1996; Viswanathan et al., 2000). IGI can be observed in various areas, such as brand preferences, consumer orientations, and values (Essiz & Mandrik, 2022; Mandrik et al., 2018). The concept suggests that parents exert a strong influence on their children's brand or product preferences and that family members share basic consumer perspectives, indicating intergenerational similarities in different areas of life (Perez et al., 2011). The effects of IGI may vary depending on factors such as conformity with peers and effectiveness of communication (Mandrik et al., 2005). Overall, IGI highlights the role of family dynamics and socialization in shaping individuals' attitudes and behaviors.

IGI significantly shapes sustainable consumer attitudes. Research has shown positive correlations between parents and children on pro-environmental attitudes and concerns (Hansen & Jacobsen, 2020). These intergenerational similarities in sustainable consumption attitudes are perpetuated through family relationships and embodied practices (Filimonau et al., 2023). The transmission of sustainable consumer attitudes is influenced by factors such as personal values, family norms, parenting style, socialization style, family communication patterns, and cultural differences (Essiz & Mandrik, 2022). The family socialization process is crucial for the transmission of intentions and impacts related to sustainable consumption. Overall, this highlights the importance of intergenerational transmission in promoting sustainable consumer attitudes. Our opening hypothesis is a fundamental one related to the existence of IGI:

H₁ₐ: Intergenerational influence on sustainable consumer attitudes exists between dyad members.

Furthermore, IGI plays a significant role in promoting sustainable consumer behavior. Existing research demonstrates that parents and children can influence each other's pro-environmental practices (e.g., recycling, donation, energy, and water saving) (Ando et al., 2015; Kong & Jia, 2023). Studies suggest that intergenerational transmission of environmental behavior occurs, with parental behaviors significantly associated with children's behaviors (Grønhøj & Thøgersen, 2009). This highlights the importance of parental influence and socialization practices in fostering environmentally responsible actions across dyadic relationships, emphasizing the need for effective intergenerational communication and engagement to promote actionable sustainable behaviors. Thus, we naturally posit:

H₁ᵦ: Intergenerational influence on sustainable consumer behaviors exists between dyad members.

3.3. Parent-child communication effectiveness

Communication within the family environment is recognized as a fundamental mechanism in the process of consumer socialization (Essiz & Mandrik, 2022; Mandrik et al., 2005; Meeusen, 2014; Moschis, 1985; Viswanathan et al., 2000). Interactions between children and parents about goods and services influence children's acquisition of consumption-related information, beliefs, and values from family members (Moschis, 1985). Extensive research has explored how family communication patterns, including frequency, content, and style, impact various socialization outcomes, regarding preferences and consumption orientations. The effectiveness of communication relates to intergenerational similarity and influence intake of sustainable consumption habits (Essiz & Mandrik, 2022; Mandrik et al., 2005; Meeusen, 2014). This highlights the importance of understanding and aligning with each other's thoughts and perspectives for successful communication. Therefore, by focusing on the ability of each member of the dyad to correctly predict the other's communication, individuals can enhance their ability to convey messages effectively and ensure better mutual understanding in interpersonal interactions (Chaffee & McLeod, 1968).

Conceptually speaking, effective communication implies a higher level of communication between the parents and children, consequently increasing the likelihood of the children being influenced to adopt their parents' consumption orientation and brand preferences (Meeusen, 2014). Higher levels of communication have been reported for mothers than fathers, and daughters than son (Viswanathan et al., 2000). The frequency and quality of communication within the family, particularly between parents and children, can promote the transmission of values and concerns related to sustainability. When parents and children discuss environmental issues, children are more likely to internalize these values and adopt concrete behaviors (Essiz & Mandrik, 2022). Furthermore, communication about the environment within the family can promote the importance of environmental issues and contribute to the development of environmental awareness in children (Meeusen, 2014). Hence, it is plausible to presume that mother and daughter as a dyadic unit who participate in more frequent and active communication about each other's everyday consumption practices are likely to exhibit greater IGI on sustainable attitudes and behaviors. Correspondingly:

H2(a-b): Communication effectiveness between dyads amplifies the level of intergenerational similarity on (a) sustainable consumer attitudes and (b) behaviors.

3.4. Receptivity to green marketing communication

Receptivity to green marketing communication can play an important role in reinforcing the IGI of sustainable and environmentally friendly behaviors (Bailey et al., 2016; Hansen & Jacobsen, 2020). Conceptually, receptivity to green marketing communication refers to the extent to which consumers are open and attentive to messages promoting environmentally friendly practices (Bailey et al., 2016). It encompasses consumers' willingness to engage with and positively perceive company communications that emphasize environmental sustainability. This receptivity is influenced by factors such as ecologically conscious behavior and environmental concern (Hansen & Jacobsen, 2020). To that end, green receptivity is considered as an individual difference factor affecting consumer behavior, distinct from environmental skepticism, concern, or attitudes toward the environment, highlighting its unique role in shaping consumer responses to green marketing initiatives (Bailey et al., 2016).

Consumers with higher levels of receptivity to green communication are more likely to respond favorably to green marketing efforts compared to those with lower receptivity levels (Bailey et al., 2016; Do Paco et al., 2019; Essiz & Senyuz, 2024). Receptivity to green communication thus appears to play an important role in reinforcing the IGI of sustainable and environmentally

friendly behaviors. Research suggests that there is a positive correlation between pro-environmental behavior and attitudes between parents and children, highlighting the importance of family influence in passing on sustainable consumption practices (Singh et al., 2020). Additionally, the reverse transmission of values and attitudes from child to parent can also impact parents' intentions to behave in a pro-environmental manner (Essiz et al., 2023). Understanding receptivity to green communication involves considering individual differences, environmental concerns, and the intergenerational dynamics that shape attitudes and behaviors toward sustainability.

Exploring the consequences of green receptivity, such as advocacy communications and behaviors between parents and children, can further elucidate its visible impact on IGI. High green-receptive individuals may engage in brand loyalty and demonstrate higher pro-environmental behaviors, promoting the transmission of attitudes and behaviors related to sustainability (Kong & Jia, 2023). Therefore, exploring its role in IGI can shed light on how attitudes and behaviors related to sustainable consumption are transmitted across generations within family dynamics. By promoting receptivity to communication, parents and children can engage in meaningful discussions, share knowledge, and contribute to sustainable development practices together.

H3(a-b): Dyads' receptivity to green communication amplifies the level of intergenerational similarity on (a) sustainable consumer attitudes and (b) behaviors.

3.5. Green subjective knowledge

Green subjective knowledge can play a crucial role in IGI dynamics, particularly concerning sustainable consumer attitudes and behaviors between parents and children (Essiz & Mandrik, 2022; Guillemot, 2018; Kong & Jia, 2023). From an epistemological perspective, green subjective knowledge represents consumers' perceptions of their knowledge about environmental and sustainable issues (Kong & Jia, 2023). The transmission of sustainable knowledge within families aligns with sociological theories of intergenerational transmission, where norms, practices, and attitudes are passed down through established social groups like the family. Subjective knowledge and practices have been found to be transmitted between generations, with parents and children playing an important role in environmental socialization (Essiz & Mandrik, 2022). Studies have identified continuities in consumption-related knowledge and attitudes across generations, suggesting that children gradually acquire knowledge and attitudes through observation and imitation mechanisms (Kong & Jia, 2023; Moschis & Churchill Jr, 1978).

Importantly, green subjective knowledge has the potential to regulate the impact of intergenerational transmission, where daughters may hold higher subjective knowledge concerning sustainability than mothers, potentially influencing their attitudes and behaviors (Essiz & Mandrik, 2022). In the context of social networks where sustainable consumption information is widely available through various sources such as the Internet, seminars, courses, and clubs, daughters are likely to report higher subjective knowledge concerning sustainability compared to their mothers (Kong & Jia, 2023). This higher subjective knowledge empowers daughters to initiate discussions and influence their mothers' attitudes and behaviors regarding sustainability. Additionally, mothers may perceive their daughters as possessing higher expertise in sustainability due to their exposure to new social movements and information sources.

Children's active role in influencing their parents' environmental behavior, known as the environmental reverse socialization effect, highlights the bidirectional nature of IGI (Gentina & Muratore, 2012; Singh et al., 2020). It was found that children's environmental knowledge

has a greater tendency to influence parents' pro-environmental behaviors than the reverse pattern (Kong & Jia, 2023). For instance, children expressing concerns about environmental issues might influence their parents' behaviors, thereby reinforcing sustainable practices within the family unit. Therefore, green subjective knowledge is expected to serve as a key determinant in amplifying the level of IGI on sustainable consumption attitudes and behaviors. Children who have higher subjective knowledge about sustainability can influence the attitudes and behaviors of their parents who grew up without this environmental awareness by initiating formal and informal discussions about sustainable consumption (Wang et al., 2022). Thus, green subjective knowledge can contribute to IGI by promoting sustainable actions within the family. We hence formulate:

H4(a-b): Dyads' green subjective knowledge amplifies the level of intergenerational similarity on (a) sustainable consumer attitudes and (b) behaviors.

3.6. Peer influence

Peer influence is recognized as a significant factor in the consumer socialization process (Essiz & Mandrik, 2022; Mandrik et al., 2005; Moschis & Churchill Jr, 1978). Peers as relevant social others play a crucial role in shaping children's preferences and behaviors, influencing product choices and brand loyalties from an early age (Easterling et al., 1995). As children mature, peer influence even tends to overshadow parental influence on purchasing decisions (Mandrik et al., 2005). Indeed, research suggests that as children get older, they spend more time with peers and communicate with them regularly, resulting in a stronger influence from peers compared to parents (Guillemot, 2018). Peers can directly encourage or discourage certain sustainable consumption behaviors and even exert social pressure on their counterparts (Essiz & Mandrik, 2022). Increased communication with peers about consumption matters leads adolescents to develop stronger social motivations for consumption and more materialistic attitudes (Moschis & Churchill Jr, 1978). When children grow up, the family influence remains preponderant for products and consumption within the private context of the home, such as private necessities, but is outranked by peer influence when it comes to products and consumption of a social or public nature, such as public luxuries (Guillemot, 2018).

One rigorous approach to examining peer influence is through the study of personality traits associated with social conformity, such as Attention to Social Comparison Information (ATSCI) (Lennox & Wolfe, 1984). ATSCI reflects an individual's propensity to conform to others' preferences for the products and brands they purchase, with high-ATSCI individuals being more influenced by peers in their consumption decisions. Conversely, low-ATSCI individuals are more sensitive to inner feelings, attitudes, beliefs, and values, indicating a lower tendency to conform to peer preferences. Overall, conformity to peers is a dynamic process influenced by various factors and plays a crucial role in consumer behavior and socialization.

In the context of this study, it can be reasoned that stronger peer influence, particularly among high-ATSCI dyads, may attenuate intergenerational transmission on sustainable and pro-environmental behavior if peer groups hold dissimilar preferences or opinions from parents (Essiz & Mandrik, 2022; Mandrik et al., 2005). This is consistent with the observation that parental influence decreases as children grow up and plays a less important role in the lives of young adults (Perez et al., 2011). Therefore, it is plausible that peer conformity may weaken IGI in environmentally friendly attitudes and behaviors.

H5(a-b): Dyads' peer conformity attenuates the level of intergenerational similarity on (a) sustainable consumer attitudes and (b) behaviors.

3.7. Direction of intergenerational transmission

As aforementioned, IGI within family dynamics encompasses the transmission of consumer skills, knowledge, and attitudes between parents and children. Traditionally, IGI has been conceptualized as flowing from parents to children, aligning with social learning theory and cultural norms (Essiz & Mandrik, 2022). However, the phenomenon of reverse consumer socialization challenges this assumption, highlighting the certain potential for children to influence their parents' consumer attitudes and behaviors, a theme that has gained increasing attention in the realm of sustainable consumption (Ekström, 2007; Essiz & Mandrik, 2022; John, 1999).

In our conceptual view, reverse socialization refers to the process where children or adolescents influence their parents' knowledge, skills, and attitudes related to consumption. This phenomenon highlights a shift from the traditional view of forward socialization, emphasizing that influence can flow from younger family members to older ones. Studies have shown that children were found to have a significant impact on their parents' sustainable consumption choices (Essiz & Mandrik, 2022; Singh et al., 2020). The age group of the child (older vs. younger), and cultural contexts (individualistic vs. collectivist) are focal factors that may influence the direction of IGI for sustainable consumption preferences, especially when environmental consciousness is heightened (Mandrik et al., 2018). For example, research conducted in collectivist cultures like India has demonstrated how adolescents' environmental concerns can influence parents' pro-environmental behaviors (Singh et al., 2020).

To reiterate, the concept of reverse socialization challenges the conventional idea of one-way influence within families and underscores the dynamic nature of learning and adaptation within familial relationships (Singh et al., 2020). This showcases how the complexity of socialization impact intergenerational dynamics, where influence flows from younger to older generations (Ekström, 2007; Essiz & Mandrik, 2022). This equally highlights the potential of children to actively educate their parents to make environmentally friendly choices and the importance of encouraging parent-child communication about environmental issues. It particularly underscores the importance of the parent-child dyad in intergenerational transmission to promote sustainable consumer attitudes and practices. Quantifying the direction of IGI is therefore essential for comprehensively studying sustainable consumption within family dynamics. Given that our sample originates from China and considering our sample characteristics (i.e., university-age women in a collectivist culture), we expect a reverse environmental socialization effect—analogous to findings of Mandrik et al. (2018). We consequently specify:

H$_6$: Intergenerational transmission on sustainable consumer attitudes and behaviors is greater from daughters to mothers than from mothers to daughters.

Summing up our conceptual rationale in this section, Figure 1 visualizes the theoretical framework of this study. In what follows, we first justify our methodological approach and then put Figure 1 into empirical testing.

Insert Figure 1 here

4. Methodology

4.1. The co-orientational model approach

Our study adopts a distinct methodological approach to explore intergenerational transmission, utilizing the robust co-orientational model (Chaffee & McLeod, 1968). In our context, this model (see Figure 2 for the visualization) is particularly suited for examining intergenerational influence within dyadic interactions and has been previously validated in intergenerational

consumer research (Mandrik et al., 2018; Moore et al., 2002). The model primarily focuses on two focal constructs: (1) agreement and (2) accuracy. Agreement is conceptualized as the level of consistency between the cognitions of two individuals, while accuracy refers to the ability of each member of the dyad to correctly predict the other's cognitions (Chaffee & McLeod, 1968).

In essence, agreement assesses if two individuals share similar beliefs or preferences, and accuracy evaluates how effectively each person understands the other's attitudes and behaviors, specifically relating to sustainable consumer attitudes and behaviors in our study. Previous research has used the accuracy metric to gauge the efficacy of communication between dyad members, suggesting that higher prediction accuracy signifies better communication (Mandrik et al., 2005). Additionally, a recent research has recognized prediction accuracy as a reliable measure for determining the direction of IGI (Essiz & Mandrik, 2022). We echo these perspectives and plan to revisit the constructs of the co-orientational model in Section 5.

Together, the co-orientational model was employed in this study to assess the agreement as a proxy of intergenerational similarity (Essiz and Mandrik, 2022) and quantify prediction accuracy between mother-daughter dyads, particularly in predicting each other's sustainable consumption orientations. This model allows for a detailed examination of how accurately one party (e.g., the daughter) can predict the views of the other (e.g., the mother) concerning specific consumption-related topics. By quantifying this predictive accuracy, the model provides an indirect measure of the effectiveness of their communication. Along with the nominal dyad approach, this model was instrumental in controlling for spurious effects by isolating the influence of direct mother-daughter communication from other external factors that might contribute to observed similarities, such as shared cultural local norms or market-driven behaviors.

This co-orientational estimation forms the basis for a dyad-specific analytical method, centered on an exact match or agreement between a mother and daughter's responses. In the absence of agreement, it implies that any intergenerational effect that may have existed has not carried over into the daughter's early adulthood in terms of attitude and behavior orientation. Conversely, if a match between the mother and daughter is found, this family dyad may be considered indicative of an intergenerational effect. However, it is essential to account for matches that might occur by chance and to statistically eliminate these before drawing any firm conclusions. This concern was addressed by utilizing the nominal dyad approach (Mandrik et al., 2005).

Insert Figure 2 here

4.2. The nominal dyad method approach

As prior noted, past studies on intergenerational transmission often relied on basic raw agreement or similarity scores between parents and children to quantify intergenerational effects. However, this approach might exaggerate the actual influence and sometimes indicate an influence where none exists due to underlying factors that predispose both members of the dyad to hold similar cognitions (Mandrik et al., 2005). Consequently, earlier research might have overstated the true extent of intergenerational similarity by not accounting for the randomized similarity that exists between dyads (for a recent critique on this topic, see Essiz and Mandrik (2022)).

To address these potential distortions and control for randomized effects, Mandrik et al. (2005) proposed the "nominal dyad" method, which introduces a macro tool for forming randomly paired dyads—termed nominal dyads—aiding researchers to calculate a so-called "nominal effect" similarity score. This score serves as a baseline to compare against the observed (raw) similarity scores, reflecting background similarities unrelated to actual intergenerational

transmission. Despite its evident utility, domain-specific applications of this method are still scarce in intergenerational research. In our study, we apply this method to calculate a mean agreement score for randomly paired parent-child dyads, serving as a benchmark to assess the impact of intergenerational transmission on sustainable attitudes and behaviors. Building on the recommendation of Essiz and Mandrik (2022), our approach marks one of the first instances of using the nominal effect to evaluate the factual scope of IGI.

The nominal dyad method helped us further control extraneous variables that could influence intergenerational similarities, such as market share or regional consumption patterns. This method involves creating random pairings of mothers and daughters (nominal dyads) to generate a baseline measure of agreement that would be expected purely by chance or due to these external influences. The actual mother-daughter dyads were then compared against these nominal dyads to determine the extent to which observed similarities could be attributed to intergenerational influence rather than random alignment or external factors. This procedure is illustrated in Figure 3. By employing these two methods together, the present study not only enhanced the robustness of its findings regarding intergenerational influence but also ensured that the results were not confounded by spurious effects. The co-orientational model provided a nuanced measure of agreement and prediction accuracy, while the nominal dyad method served as a rigorous control for non-intergenerational factors, allowing for a more precise estimation of intergenerational influence.

Insert Figure 3 here

4.3. Parallel survey designs

Akin to earlier intergenerational studies evaluating dyadic relationships (e.g., Moore-Shay & Lutz, 1988; Moore et al., 2002), our research employed the parallel survey method. This involved developing two parallel but distinct questionnaires for each dyad, one for the daughter and one for the mother, both administered using an online survey tool (https://questionstar.com/). To ensure independence of the responses, dyad members were explicitly instructed to complete their questionnaire without communicating their answers. The parallel survey method was specifically chosen to quantify the constructs of the co-orientational model. The rationale behind online data collection was twofold: (i) to minimize resource use (e.g., printing, shipping) and (ii) to enhance response rates from dyads, thereby attempting to reduce the likelihood of nonresponse bias. Questions common to both surveys were tailored to match the respondent; for example, daughters saw the statement "Over the years, my mother and I have established good communication," while mothers received a corresponding statement about their daughters.

In collectivist cultures, individuals often tend to align their responses with socially desirable norms, especially within close family relationships where preserving harmony is important (Hofstede, 2001). To address this, we thoughtfully structured the survey to maintain anonymity and reduce the impact of social desirability bias. This was accomplished by conducting separate, parallel surveys for mothers and daughters, where each participant predicted the other's responses without any discussion. This strategy aimed to lessen the influence of conformity and encouraged more authentic responses.

Via parallel surveys, participants were asked to predict their dyad partner's attitudes and behaviors concerning sustainable consumption. For instance, a question in the daughter's questionnaire asked, "My mother would avoid buying products that pollute the water." To ensure consistency in terms of response accuracy between daughters and mothers and preserve the integrity of measurement scales, the questionnaires were initially developed in English.

They were then translated into Chinese, applying the parallel back-translation method (Buil et al., 2012). This involved separate translations and back-translations by two bilingual Chinese-English speakers, followed by a comparison of the back-translated versions. This process ensured linguistic and cultural appropriateness. It was critical in maintaining the integrity of the survey items and ensuring that both mothers and daughters could understand and respond to the questions accurately, reducing the risk of misinterpretation that could lead to biased results. Potential discrepancies were discussed and resolved among the translators and principal investigators to ensure both versions were equivalent and understandable to the Chinese dyads.

4.4. Sample selection, study procedures, and demographic composition

While intergenerational effects with different sizes were earlier noted across various family dyads such as mother-daughter, father-daughter, mother-son, and father-son, narrowing the focus to specific dyads can enhance the accuracy of research by reducing variability among participants. To that end, Essiz and Mandrik (2022) emphasized the importance of studying same-gender dyadic combinations to better understand sustainable consumer behavior patterns that emerge through interpersonal interactions. This is because dyads of the same gender generally display more commonalities and shared interests, particularly in forming consumption-related preferences (Carlson et al., 1994; Moore-Shay & Lutz, 1988). Despite the potential variability driven by factors like household dynamics (Thøgersen & Grønhøj, 2010), communication styles (Meeusen, 2014; Moschis, 1985), environmental awareness (Singh et al., 2020), cultural background (Mandrik et al., 2018), product category (Moore et al., 2002), and the domain of consumption (Essiz & Mandrik, 2022), mothers as opposed to fathers are often perceived as the primary influencers in the consumer socialization of their children. This understanding led us to opt for mother-daughter dyads as our study's focal sampling unit.

To establish a baseline for our required sample size, we conducted a preliminary power analysis using G*Power 3.1 software (Faul et al., 2009), which indicated we needed at least 260 participants (130 mother-daughter dyads) based on an effect size of .45 (Cohen, 2013), an alpha level of .05, and 95% statistical power in the presence of 6 latent variables. The online survey questionnaire was designed and disseminated via Survey Star (https://www.wjx.cn/). To target daughters, we posted the survey link on three different platforms: the Akcome Cloud platform, the Mom Community, and the Questionnaire Star research platform. It allowed us to recruit 181 university-age women from China, who were asked to invite their mothers to participate via WeChat (https://www.wechat.com/). The response rate of mothers was 94.2%. Of which, 276 (138 mother-daughter pairs) met the screening criteria and were deemed fully valid after excluding incomplete submissions, patterned responses, and those who failed the attention check (e.g., "Please select 'strongly disagree' to indicate you are paying attention to this statement.") (Essiz and Senyuz, 2024). This resulted in a success rate of 76.2% for the questionnaires. The sample includes respondents from Zhejiang, Jiangsu, Shandong, Sichuan, Guangdong, and Hebei provinces. The data collection period began on October 23, 2023, and concluded on January 4, 2024.

While completing the study, participants indicated their agreement on statements using a 5-point Likert scale, from "Strongly disagree (1)" to "Strongly agree (5)," concerning SCAs, SCBs, and green subjective knowledge. Each dyad member also assessed how their partner would likely respond to the same statements on SCAs and SCBs. Additional sections of the study covered questions related to peer conformity, self-reported communication, receptivity to green communication, and demographic information. To ensure face validity of measures, participants were explicitly instructed not to communicate with each other about their item predictions and overall responses.

Regarding the demographic breakdown of the sample, 60.4% of the daughters were aged 18–23, while the remaining 39.6% were between 24 and 30 years old. Of these daughters, 66.4% were pursuing a bachelor's degree, and 30.3% were graduate students. For the mothers, 48.4% were aged 40–49, and 30.3% had completed high school. Additionally, 35.4% of the mothers had more than one child. Monthly, the household disposable income bracket for both daughters and mothers (75.4%) were between 10,000 and 50,000 CNY.

5. Measures

5.1. Dependent variables

The main dependent variable in our study is the raw agreement between mothers and daughters regarding SCAs and SCBs, which we treat as a measure of intergenerational similarity—that is, how closely the responses of each mother-daughter dyad align. This similarity is quantified by calculating the absolute value differences between each daughter's and mother's responses to items of SCAs and SCBs. We then summed these absolute differences for each dyad to create individual dyad agreement scores. To derive an overall mean agreement value for both SCAs and SCBs, we aggregated these scores and divided them by the total number of dyads. Lower mean scores indicate greater intergenerational agreement, following the typology of Chaffee and McLeod (1968) in working with absolute differences.

All in all, our study investigates a comprehensive range of items related to SCAs and SCBs, spanning both overt and subtle aspects of sustainable consumption, such as sustainable transportation, charitable donations, fair trade practices, eco-friendly product labeling, green purchasing behaviors, and environmental impacts, such as air and water pollution, energy savings (including electricity, natural gas, and fossil fuels), waste minimization, recycling, reusing, and general environmental concerns. To capture potential intergenerational similarities in this wide domain, we derived fifteen items by adapting and modifying validated measures from Essiz and Mandrik (2022) (see Appendix A for measures).

5.2. Moderator variables

The first moderator variable examined in this study is parent-child communication between daughters and mothers. This communication is assessed subjectively through self-reports, where participants rate their perceived effectiveness of interpersonal communication within the dyadic relationship using a mother-daughter communication scale. The scale consists of four items adapted from Essiz and Mandrik (2022). The total subjective communication score is calculated by summing the scores from both the daughter and the mother. Such a summation process was done for all moderator variables. The second moderator variable is receptivity to green communication, measured using the green advertising receptivity scale of Bailey et al. (2016) with nine items. This scale helped us to identify dyads that are more likely to respond positively to green marketing efforts.

Moreover, the third moderator variable, green subjective knowledge, is evaluated by modifying seven items from Essiz et al. (2023). This scale assesses subjective knowledge in green consumption, including topics such as recycling, sustainable giving, and organic waste composting, among others, asking respondents to rate their familiarity with these processes. The fourth and final moderator variable is peer influence, specifically examining a trait associated with peer conformity. This was analyzed using six questions from the Attention to Social Comparison Information (ATSCI) scale by Lennox and Wolfe (1984), which gauges the extent to which individuals consider peer behaviors as a guide to their actions. It is noteworthy that our study focuses on college-aged daughters, typically living away from home, where peer influence is an applicable theme. Details of the measurement scales used are documented in Appendix A.

5.3. Inferring the direction of intergenerational transmission

A final methodological point to note is that we infer the direction of IGI in accordance with the co-orientational model (Chaffee & McLeod, 1968)—that is, by analyzing how accurately each member of a mother-daughter dyad predicts the other's responses to survey items concerning SCAs and SCBs. Specifically, we calculate the item prediction accuracy score for each participant by measuring the absolute differences between their predicted response and their partner's actual response. Following the procedure of Essiz and Mandrik (2022), these individual scores are then aggregated to compute the total prediction accuracy score (TPAS) for each dyad member, which is further averaged across the sample to obtain the mean TPAS for both SCAs and SCBs.

To differentiate between the prediction accuracy of daughters and mothers, we switch the roles of predictor and respondent within each dyad and repeat the calculation process, resulting in two distinct mean TPAS values—one representing the daughter's prediction accuracy and the other the mother's. Lower mean scores indicate greater accuracy, reflecting smaller discrepancies between predicted and actual responses. Finally, by comparing the TPAS ratios between daughters and mothers, we assess the direction of transmission. A ratio exceeding one suggests that intergenerational transfer flows from daughters to mothers, aligning with the co-orientational model's predictions. Conversely, a ratio below one indicates that the influence moves from mothers to daughters, positing that the person who predicts their partner's responses more accurately is likely the recipient of stronger influence.

6. Results

6.1. Validity and reliability

IBM SPSS Statistics V$_{28.0}$ was employed to code and analyze the present data in this study. Confirmatory factor analysis (CFA) was initially conducted to assess the validity of the constructs, testing the fit between the data and the measurement model, and to establish a basis for evaluating discriminant and convergent validity. Each construct was analyzed independently in the CFA, linking each observed variable directly to its corresponding latent variable. A unified measurement model was developed for the dyadic data, yielding fit indices of GFI = .96, CFI = .93, RMSEA = .014, χ^2/df = 2.79. Following the guideline of Hair et al. (2010), discriminant validity was examined by drawing covariance paths among latent variables to explore correlations between two exogenous constructs. Correlations did not exceed the threshold of .85 and ranged from (−.16, .57), indicating no significant issues with redundancy and multicollinearity (see Table 1a for variance inflation factors (VIFs)). For robustness, two separate hypothetical measurement models were tested: one for daughters and another for mothers, showing fit indices for the daughters' model at GFI = .95, CFI = .91, RMSEA = .012, χ^2/df = 2.66, and for the mothers' model at GFI = .98, CFI = .92, RMSEA = .015, χ^2/df = 2.84, indicating adequate model fits.

Additionally, all standardized factor loadings for the dyadic data were above .70, significant at $p < .01$, confirming that observed variables adequately represented their latent constructs (see Table 1b). Convergent validity was further supported by computing average variance extracted (AVE) values alongside Fornell and Larcker (1981), with all constructs showing AVE scores between .71 and .79, surpassing the minimum threshold of AVE ≥ .50 (Hair et al., 2010). Overall, this study utilized six multi-item scales. Internal consistency was verified through Cronbach's α and composite reliability (CR), with all α and CR coefficients exceeding the .70 threshold for each construct, indicating acceptable reliability (Nunnally, 1978). Comprehensive validity and reliability results are denoted in Table 1a.

Insert Table 1a and Table 1b here

6.2. Common method bias

Common method bias (CMB) might cause Type I and II errors by exaggerating the correlations between constructs (Podsakoff et al., 2012). It was minimized in this study since data were collected from different types of respondents in parent-child pairs. Nevertheless, to statistically control the presence of potential CMB, we employed Harman's one-factor test (Harman, 1976) following the primer of MacKenzie and Podsakoff (2012). This involved conducting exploratory factor analyses with unrotated factor solutions, where all variables were loaded onto a single factor to determine the common method variance. The results showed that the single factor accounted for 32.5% of the variance in the daughters' data and 29.7% in the mothers' data, both below the 50% threshold suggested by MacKenzie and Podsakoff (2012), indicating no significant risk of CMB.

6.3. Testing the presence of intergenerational transmission

We next tested the presence of intergenerational similarities in SCAs and SCBs by evaluating H_{1a} and H_{1b}. We specifically assessed the raw level of similarity between mothers and daughters against a nominal effect using the nominal dyad method. Originally, following the procedure described by Mandrik et al. (2005), nominal dyads were formed using a macro in Excel, and 250 random pairings were generated to calculate the average nominal effect values for SCAs and SCBs. Precisely, nominal mother/daughter pairs were created by randomizing daughters from actual pairs and then reassigning them to mothers randomly. This allowed us to attain nominal randomization value for each dyad in the sample and rule out spurious effects. Subsequently, we conducted two tests for normality on each construct (i.e., SCAs and SCBs) to determine whether the nominal effects followed a normal distribution (the results are presented in Figures 4 and 5). The Kolmogorov-Smirnov tests for normality were not significant ($ps > .05$) for both constructs, and the kurtosis and skewness values were within the normal range of $(-2,2)$ (George, 2011), remaining relatively low. This suggests that the distribution of nominal effects can be considered normal, supporting the validity of our randomization procedure for further analysis of the hypotheses.

Insert Figures 4 and 5 here

To evaluate H_{1a} and H_{1b}, a series of analyses of variances were conducted to examine the differences between nominal effects and raw mean similarities (see Table 2 for full results). Significant differences were found between the nominal effects and the actual means for both SCAs and SCBs on a construct basis. Given that the actual intergenerational agreements between daughters and mothers were significantly higher than the nominal effects for both constructs ($Fs > 6.81$, $ps < .01$), this supports H_{1a} and H_{1b}. Additionally, to further analyze mother-daughter similarities in individual sustainable attitudes and behaviors, we provided detailed descriptive statistics and raw vs. nominal correlations on an item-by-item basis (revisit Table 2). Significant effect sizes ($ps < .05$) were noted for each item after nominal effects were ruled out, supporting the existence of intergenerational similarity.

Insert Table 2 here

6.4. Testing factors affecting intergenerational similarity

We next conducted two multiple regression analyses to explore the factors influencing intergenerational similarity, as specified in Table 3. The first regression model ($F(4,137) = 26.41$, $p < .01$) used raw mother-daughter similarity in SCAs as the dependent variable for the sake of brevity, with receptivity to green, self-reported communication, subjective knowledge, and peer conformity as moderator variables, explaining 41% (R^2) of the variance in SCAs. The second model ($F(4,137) = 36.21$, $p < .01$) judged raw mother-daughter similarity, but focused on SCBs as the dependent variable, utilizing the same moderator variables and achieving a

higher explanatory power of 55% (R^2) in SCBs. There was no multicollinearity concern in either regression model, as indicated by collinearity tolerances above .80 and VIFs ranging from 1.02 to 1.18, which are within acceptable limits and below 3 (Hair et al., 2010).

Insert Table 3 here

Collectively, for both SCAs and SCBs, main moderator variables such as dyads' receptivity to green (SCAs: β = .38, SCBs: β = .28), self-reported communication (SCAs: β = .33, SCBs: β = .30), and green subjective knowledge (SCAs: β = .25, SCBs: β = .37) amplified intergenerational similarity. Contrarywise, peer conformity (SCAs: β = -.26, SCBs: β = -.32) had a negative impact, attenuating raw intergenerational similarity levels. Together, these findings support H_{2a}, H_{2b}, H_{3a}, H_{3b}, H_{4a}, H_{4b}, H_{5a}, and H_{5b} ($ps \leq$ .03). Amid controlling for demographic factors such as age, education, individual income, and household size, only the educational background of mothers and daughters significantly affected raw intergenerational similarity for SCAs ($\beta_{Model\ 1}$ = .13) and SCBs ($\beta_{Model\ 2}$ = .11), while the effects of age, individual income, and household size were not significant ($ps_{Model\ 1,2} > $ .24).

6.5. Evidence of the reverse intergenerational transmission

Our final hypothesis, H_6, investigates the reverse influence from daughters to mothers. We essentially conducted t-tests to compare the TPAS between daughters and mothers for SCAs and SCBs. The results were significant for SCAs, $t(137)$ = 4.09, $p < $ .001, and for SCBs, $t(137)$ = 2.60, $p < $ .001, showing that mothers had more accurate predictions (lower mean scores) than daughters for both groups. According to the accuracy construct of the co-orientational model, this suggests that the primary direction of transmission is from daughters to mothers, as detailly envisaged in Table 4.

Insert Table 4 here

To delve deeper into these findings, we carried out an additional post-hoc analysis, illustrated in Figure 6. In line with the approach of Essiz & Mandrik (2022), this analysis compared three groups based on whether daughters' prediction accuracy scores were higher, the same, or lower than those of mothers: (1) D < M, (2) D = M, and (3) D > M. This group comparison supports our H_6 on reverse transmission, revealing a significant difference in prediction accuracy (68.2%$_{D<M}$ vs. 24.3%$_{D>M}$) (Z = 6.11, $p < $ .01). Summing up this section, Table 5 summarizes the results supporting our hypotheses.

Insert Figure 6 here

Insert Table 5 here

7. General discussion of main findings and theoretical contributions

7.1. Intergenerational transmission and reverse transmission
Contributing to the conceptual advancement of the environmental consumer socialization literature, our study provides significant insights into IGI on SCAs and SCBs within mother-daughter dyads. SCAs reflect consumers' values towards environmental consciousness and social sustainability, measuring the extent to which dyads prioritize and integrate environmental and social considerations into their consumption behaviors and self-identity. Our findings highlight the importance of IGI in reducing consumption, selecting environmentally friendly products, conserving resources, and supporting ethical production practices between dyad members (H_{1a}). SCBs consist of various actions and practices adopted by dyads to minimize their environmental impact and support sustainable practices. It includes concrete eco-friendly purchasing and consumption behaviors, such as energy conservation, recycling, ethical purchasing, and transportation choices. Our findings demonstrate the critical role of IGI between dyad members in promoting these sustainable behaviors through their daily actions

and consumer decisions (H_{1b}). These results align with previous research by Grønhøj & Thøgersen (2009) and Essiz and Mandrik (2022), extending the scope of IGI effect and highlighting the importance of intergenerational transmission to reduce environmental footprint and support sustainable development.

A particular noteworthy contribution of our study is the exploration of reverse intergenerational transmission, where younger generations influence older ones. Our findings reveal that the primary direction of intergenerational transmission goes from daughters to mothers (H_6), illustrating the reciprocal nature of transmission within families, especially concerning sustainability. This finding aligns with Singh et al. (2020), arguing that offspring significantly influence their parents to adopt sustainable practices. Moreover, it supports the argument presented by Essiz and Mandrik (2022), that reverse transmission from daughter to mother can also impact the mother's pro-environmental intentions and behaviors.

Overall, our study enhances the conceptual understanding of how sustainable attitudes and behaviors are transmitted across generations, emphasizing the dual pathways of influence and the critical role of the younger generation in shaping the sustainable practices of their parents. This highlights the bidirectional nature of intergenerational transmission within the context of sustainability. Given the collectivistic disposition of Chinese households, these findings are reasonable, as the dynamic social environment of the family allows for mutual learning between parents and children.

7.2. Factors influencing intergenerational transmission process

Our research corroborates two major factors—communication effectiveness and peer conformity—that have been suggested to affect IGI in past consumer research (e.g., Mandrik et al., 2005). Communication effectiveness assesses the quality and openness of communication within a dyadic unit, specifically between daughters and their mothers. It reflects the ease, mutual understanding, and overtness in their interactions (Essiz & Mandrik, 2022). Originally studying this factor in sustainable consumption domain, our findings demonstrate that high communication effectiveness between mother-daughter dyads significantly amplifies IGI (H_2). This supports and extends the findings of Meeusen (2014) and Mandrik et al. (2005), indicating that the depth and quality of the relationship and communication dynamics within the dyad positively influence IGI. Moreover, peer conformity assesses the degree to which an individual is influenced by their peers, emphasizing reliance on social cues, the desire to fit in, and the sensitivity to others' reactions (Lennox & Wolfe, 1984). Our findings show that peer conformity is negatively related to mother-daughter similarity, diminishing the IGI (H_5). These results are consistent with He et al. (2023), indicating that individuals within dyads tend to conform to peer behavior, highlighting the importance of social cues and the need to fit in beyond the family circle.

In addition to these factors, we introduce two additional boundary variables of IGI—green subjective knowledge and receptivity to green marketing communications—which are principally understudied in the extant literature. Green subjective knowledge assesses the extent of dyads' self-perceived knowledge regarding green consumption practices and sustainability, reflecting both a general understanding and specific expertise in green practices (Essiz et al., 2023). Our findings reveal that a higher level of green subjective knowledge within mother-daughter dyads amplifies IGI (H_4). This finding is in line with recent research by Kong and Jia (2023), which demonstrates a positive influence of self-knowledge related to green products on IGI. The final factor, receptivity to green marketing communications, assesses a dyad's responsiveness towards green marketing efforts, reflecting support for environmentally friendly brands and attentiveness to green advertising (Bailey et al., 2016). Our findings indicate that higher receptivity to green marketing communications enhances IGI (H_3). In line with

Filimonau et al. (2023), this finding could be explained by the fact that intergenerational support for green brands, and attention to environmental messages play a significant role in shaping attitudes and behaviors towards sustainability.

All in all, our research on dyadic intergenerational transmission examines four factors that either intensify (communication effectiveness, green subjective knowledge, and receptivity to green communication) or diminish (peer conformity) IGI on sustainable consumer attitudes and behaviors. By identifying these factors, our research enhances the conceptual understanding of how sustainability-oriented practices are regulated across generations. Theoretically, these findings urge consumer theorists to leverage intergenerational effects to map out sustainable consumption within dyadic relationships, emphasizing the importance of effective communication, knowledge sharing, and positive receptivity to green marketing communications.

7.3. Collectivist context
In collectivist cultures, where group cohesion and parental authority are highly valued under the effect of Confucianism, the transmission of sustainability-oriented attitudes and practices is deeply embedded in family interactions. Given the scarcity of intergenerational research in collectivistic Chinese context, this research highlights the pivotal role of mother-daughter dyads in facilitating the transmission of sustainable consumption patterns. This cultural context enhances the likelihood that sustainable consumer attitudes and behaviors are adopted and maintained across generations, reinforcing intergenerational dynamics in promoting sustainable consumption. In Chinese families, where Confucianism may lead to suppressed emotions that conflict with authoritarian norms (Mandrik et al., 2018), it is conceivable that college-aged daughters in our sample could turn to different sustainable options as a means of expressing their own identity, or potentially as a way to challenge anti-environmental practices within households. This may provide a plausible account for our reverse IGI effect and extend the findings of previous studies conducted in similar collectivist settings (Cui et al., 2022; Varshneya et al., 2017).

This phenomenon can be understood by exploring the sociocultural or psychological factors that characterize collectivist cultures. First, collectivist family dynamics often emphasize interdependence and mutual influence among family members (Hofstede, 2001). Daughters, especially those exposed to new ideas through education or peer interactions, may introduce modern consumption patterns, values, or brand preferences that resonate with their mothers. If this contrasts with traditional patterns (Kongsompong et al., 2009), families in rapidly changing societies face challenges in balancing traditional collectivistic values with emerging values promoting autonomy (Akyıl et al., 2016). The process can be facilitated by the strong familial bonds and respect for the younger generation's knowledge, which is increasingly valued as society modernizes.

Psychologically, mothers in collectivist cultures might be more open to adopting their daughters' preferences as a way to maintain closeness and harmony within the family unit. In collectivist cultures, mothers and daughters exhibit greater intimacy, connectedness, and relational harmony, while showing less individuality compared to their counterparts in individualist cultures (Gilani, 1999). In Mexico for instance, family life-cycle stage significantly impacts IGI strength in brand preferences (Perez et al., 2011). This willingness to accommodate can stem from a desire to support the daughter's individuality while still upholding the collective family identity. Additionally, the younger generation's exposure to contemporary media and global trends may position them as key influencers within the family, leading to reverse transmission.

8. Methodological, practical, and environmental management implications

8.1. Methodological implications

Since using simple correlation analysis to deduce intergenerational similarities may lead to biased results, this bias can be reduced by employing a multi-method approach to evaluate the factors influencing sustainable consumer attitudes and behaviors (Moore et al., 2002). In this sense, this study contributes to previous research (e.g., Filimonau et al., 2023) by proposing a methodological arsenal to better control for confounding effects and provide more rigorous tools to measure intergenerational transmission within dyadic relationships.

This study further validates the agreement construct of the co-orientational model (Chaffee & McLeod, 1968) used in previous studies (Mandrik et al., 2018; Moore et al., 2002) to examine IGI within dyadic interactions. In doing so, this study confirms the validity of Essiz and Mandrik (2022) procedure for inferring the direction of IGI, and thus the reliability of predictive accuracy construct as a measure for assessing the direction of transmission.

What is more, this study applies the "nominal dyad" method of Mandrik et al. (2005) to minimize measurement biases found in previous research and to control for random effects (Essiz & Mandrik, 2022). Thus, the methodological approach used in this study contributes by providing one of the first analyses using the nominal effect to assess the wide scope of IGI. Thus, based on data from the parallel survey approach (e.g., Moore-Shay & Lutz, 1988; Moore et al., 2002), future research can rely on calculating a mean agreement score for randomly paired dyads to assess the influence of IGI more accurately on sustainable attitudes and behaviors.

8.2. Practical and environmental management implications

Nowadays, practitioners prioritize promoting cleaner production and consumption, yet face challenges in differentiating their sustainable products. Capitalizing on intergenerational transmission effects helps to build green brand equity (Moore et al., 2002) and therefore deserves more focus in configuring sustainable marketing strategies. Based on our findings about mother-daughter similarities and reverse transmission on sustainable attitudes and behaviors, managers are advised to use a pull marketing approach through children to attract the attention of parents. For instance, targeting daughters in the green communication process could not only foster environmentally friendly habits from a young age but also sway the broader household. In agreement with Peattie (2010), we contend it is crucial for marketers to provide clear information about labor practices, the use of recycled materials, and the environmental impact, such as carbon footprints, of sustainable products to safeguard transparent brand positioning. Understanding these factors can help mother-daughter pairs to make well-informed choices and fortify their receptivity to sustainable products.

Considering the multi-sensory nature of consumer experiences today, we recommend using sensory cues and virtual reality to enhance the appeal of sustainable products to mother-daughter dyads. This may include both physical and digital store actions such as using immersive experiences (e.g., metaverse) to showcase the environmental impact of sustainable products. For instance, managers could look at how to develop immersive virtual reality experiences that allow mother-daughter pairs to virtually explore the production process of sustainable products, emphasizing eco-friendly practices and the impact of their choices on the environment. Another action is to employ sensory cues, such as scent, texture, and ambient sound, in enhancing the appeal of sustainable products to consumers, particularly for mother-daughter pairs. This would involve implementing sensory cues in a controlled retail store environment and measuring changes in product engagement and sales. Indeed, the collectivist culture of China (Mandrik et al., 2018) and the rise of online social media platforms present opportunities for using a buzz marketing approach to augment word of mouth among young

people and their social circles. For example, in digital campaigns, sustainable brands may reduce cognitive dissonance and lead to positive spillover effects on sustainable behaviors by highlighting the prominence of parent-child communication in preserving environmental resources. Following the recent advice of Essiz et al. (2023), we posit that sustainable products should be marketed not only as ethical alternatives but also as practical solutions that offer personal benefits to bridge the gap between values and actions among mother-daughter dyads.

Thereafter, these strategies could enhance sustainable consumption in physical stores by helping families better absorb product information and encourage intergenerational communication. In-store environments, machine learning algorithms could be used to identify family groups that are more likely to respond to intergenerational marketing strategies based on their browsing behavior. Green retailers could use historical purchasing data to tailor their sustainable product offerings automatically for such groups. As such, they may also consider co-branding with well-known brands to lower risk perceptions towards sustainable products in family consumption settings. This can be done by offering special discounts on co-branded products appealing to mother-daughter pairs to encourage discussions about responsible consumption and intergenerational shopping.

Last but not least, our research underscores the importance of establishing public policy and environmental management guidelines that educate families about sustainable consumption practices. Policymakers ought to emphasize the importance of environmental knowledge and highlight the urgency of ecological risks in line with SDGs when developing public campaigns (i. e. Yang et al., 2023) and environmental management guidelines. Taken together, it is fundamental to recognize the significant influence of younger generations in altering the consumption patterns of their older relatives. Particularly, the present study found that effective communication within families enhances the transmission of sustainable attitudes and behaviors. Environmental managers might consider developing initiatives that foster open and effective communication about sustainability at home, possibly through community workshops that provide individuals with the knowledge and tools needed to discuss environmental issues with their family members. Further, we also revealed that receptivity to green marketing communications strengthens intergenerational alignment in sustainable behaviors. Therefore, environmental managers should design marketing campaigns that are not only informative but also appeal to both younger and older generations, emphasizing the collective benefits of sustainable consumption. Considering the present study's emphasis on collectivistic cultures, especially within Chinese families, environmental management practices should be culturally sensitive and tailored to reinforce collective values. In collectivist societies, strategies that highlight community and familial well-being may be more effective in encouraging sustainable behaviors across generations.

9. Limitations, future research avenues, and concluding remarks

Like any empirical research, ours has limitations that offer opportunities for future research. First, our study depends on self-reported measures, and in an era where there is a growing emphasis on cleaner production and consumption, mother-daughter pairs might tend to overstate the actual sustainable attitudes and practices they have adopted. To minimize this risk and counteract social desirability bias (Podsakoff et al., 2012), we rest on the integrity of the participants and employ anonymous online parallel surveys. However, it seems inevitable that potential psychological biases could lead to either overestimating or underestimating IGI. In this regard, the cross-sectional nature of our data provides only a static snapshot, overseeing the dynamic interactions and transmission changes over time between mothers and daughters regarding sustainable attitudes, behaviors, green receptivity, subjective knowledge, peer conformity, and communication effectiveness. Therefore, we recommend replicating this study

using qualitative methods such as focus groups and ethnography, as well as longitudinal controlled experiments, to capture changing behaviors and establish causality in the intergenerational transmission of sustainable consumption.

Second, since our sample comes solely from China, our results are inherently linked to its market maturity and specific economic and cultural traits. Therefore, oversimplifying these findings to other consumer markets without accounting for their distinctive characteristics could lead to misinterpretations. To avoid such risk of ethnocentrism, conducting cross-national comparisons incorporating individualistic cultures would enhance the external validity of our proposed model. To extend the reach of our findings, a valuable avenue could involve exploring the nuanced differences in intergenerational similarity across various sustainable brand or product categories (Filimonau et al., 2023) and service-oriented sustainable consumption sectors such as tourism, hospitality, and luxury (Essiz & Senyuz, 2024), particularly focusing on factors like similarities in willingness to pay a price-premium and intentions to provide word of mouth recommendations.

Additionally, we do not neglect the possibility that our findings might vary in individualistic societies (e.g., United States) and less protective familial contexts, where college-aged daughters may choose different brands to assert their own identity or to rebel against family authority (Mandrik et al., 2018), or where the stronger informational influence of peers plays a significant role in formation of sustainable consumption receptivity and patterns (He et al., 2023). To that end, it is cardinal to conduct empirical studies that explore intergenerational boundaries by considering other dyad types (e.g., father/son, father/daughter, mother/son), family styles (e.g., protective, consensual), other socializing agents (e.g., spouse, disruptive media tools), and observable differences in social background (e.g., childhood socioeconomic status). Thus, future studies may compare how collective societal values intersect with IGIs (Yang et al., 2024) by comparing different types of Asian and non-Asian consumer dyads. Indeed, if Yang et al. (2024) found that a collectivist culture has a positive effect on pro-environmental behavior, future studies could systematically compare consumer dyads from countries that are positioned differently on the collectivism scale (Hofstede, 2001).

Next, akin to the conclusions of Essiz and Mandrik (2022), our results, which show comparable average values for nominal effects—4.17_{SCAs} and 3.75_{SCBs}—, suggest that other boundary factors could also play a role in the process of sustainable consumer socialization. While we examined four boundary factors, future research could delve deeper into value dimensions such as biospheric (Ajibade & Boateng, 2021), altruistic (Andrade et al., 2022), and materialistic values (Liobikienė et al., 2020), as well as the role of risk aversion in the intergenerational transmission of sustainable attitudes and behaviors. This could help uncover the intricate psychographic mechanisms guiding IGI. Additionally, our understanding of the motives behind reverse environmental socialization remains limited and requires further investigations (e.g., Singh et al., 2020). It is equally vital to explore whether parents and children mutually acquire and transmit anti-environmental skills and practices.

Lastly, the dyadic analysis method was preferred because it enabled us to delve deeper than simply reporting the observed raw effects using Pearson correlations and simple regressions, which often tended to overstate intergenerational transmission process (Essiz and Mandrik, 2022; Meeusen, 2014). Moreover, while our dyadic approach shares some similarities with the method proposed by Moore et al. (2002), it represents an advancement, as it can be applied to testing continuous independent and dependent measures like sustainable consumer attitudes and behaviors. However, our dyadic approach does have its limitations. First, it is not applicable outside of dyadic relationships and requires normality assumptions about data distribution before proceeding with hypothesis testing. Second, while the nominal dyad method enabled us

to control stereotype accuracy effects, it does not facilitate the differentiation of factors that might covary with intergenerational effects (Mandrik et al., 2005). For this reason, it does not permit the separation of one stereotype effect from another.

It is thus important to diagnose that both the nominal and co-orientational approaches are vulnerable to psychological biases (e.g., social desirability and response bias), which may influence the responses of both generations and potentially lead to an over or underestimation of IGI. Hence, advancements in research methods are a pressing necessity for a deeper exploration of the dyadic IGI phenomenon. We suggest that future IGI studies combine both linear approaches, such as partial least squares, and nonlinear techniques like artificial neural networks (e.g., Warren-Vega et al., 2024), to refine the predictive power of their proposed conceptual frameworks.

In sum, our research findings are promising as they highlight the role of reverse intergenerational cooperation in China, where the youth are taking the lead in influencing family consumption patterns toward achieving a more sustainable community. As we conclude at this juncture, it is plain that the topic of IGI covers a wide array of phenomena under the realm of consumer socialization and merits substantial attention by responsible stakeholders focused on cleaner production and responsible consumption to uphold the 2030 agenda for SDG 12 (Barta et al., 2023).

Conflict of interest

The authors declare that there is no conflict of interest.

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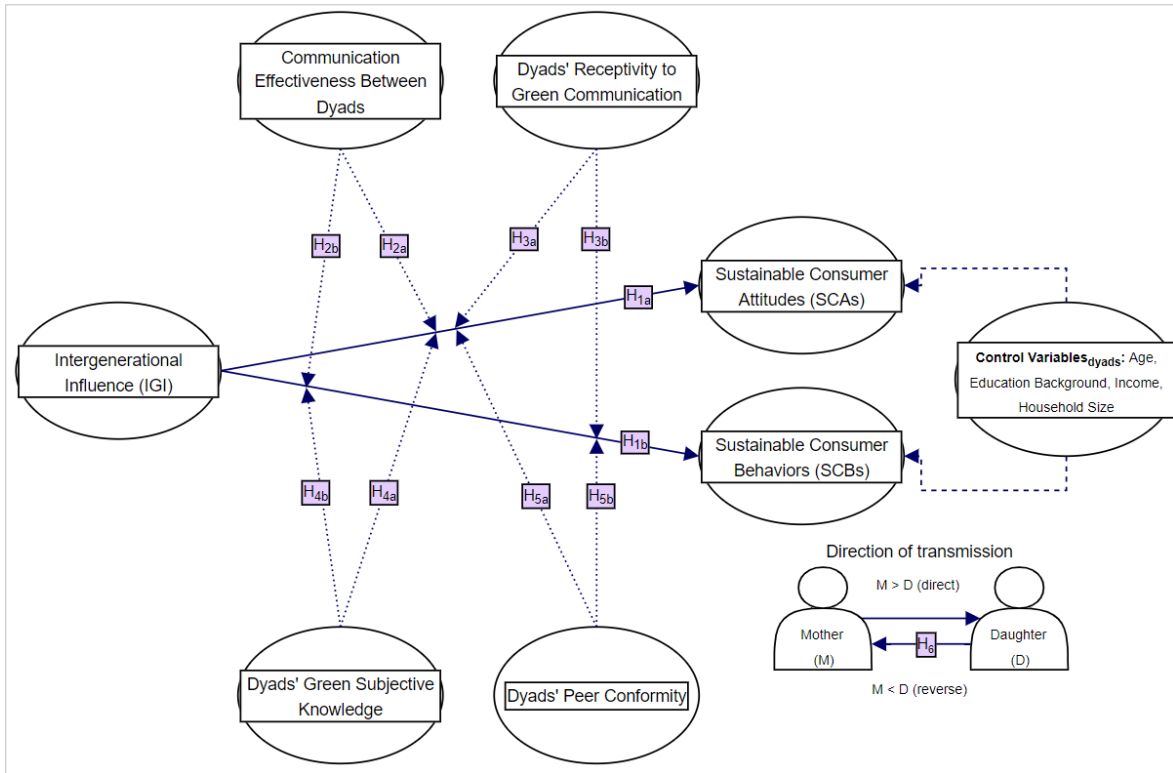
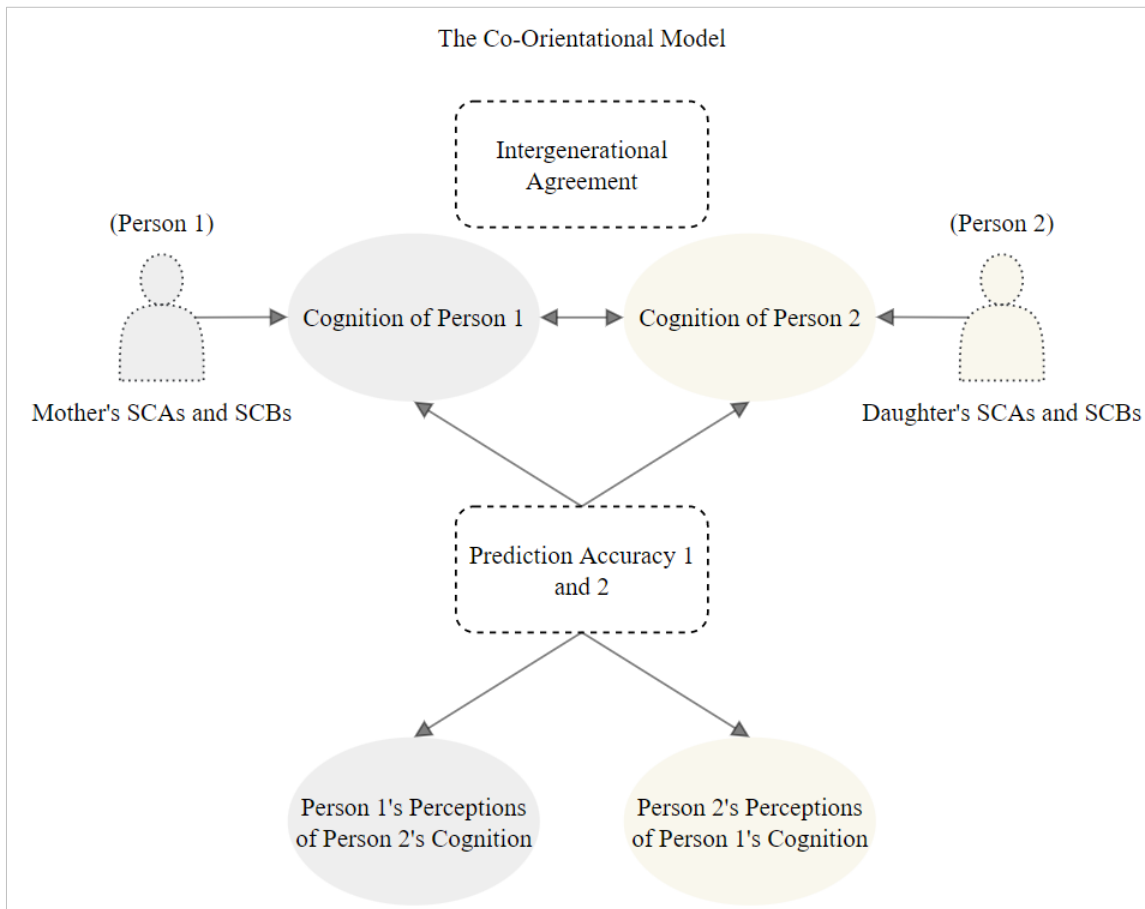**Figure 1.** The proposed conceptual framework.

Figure 2. The proposed co-orientational model approach.
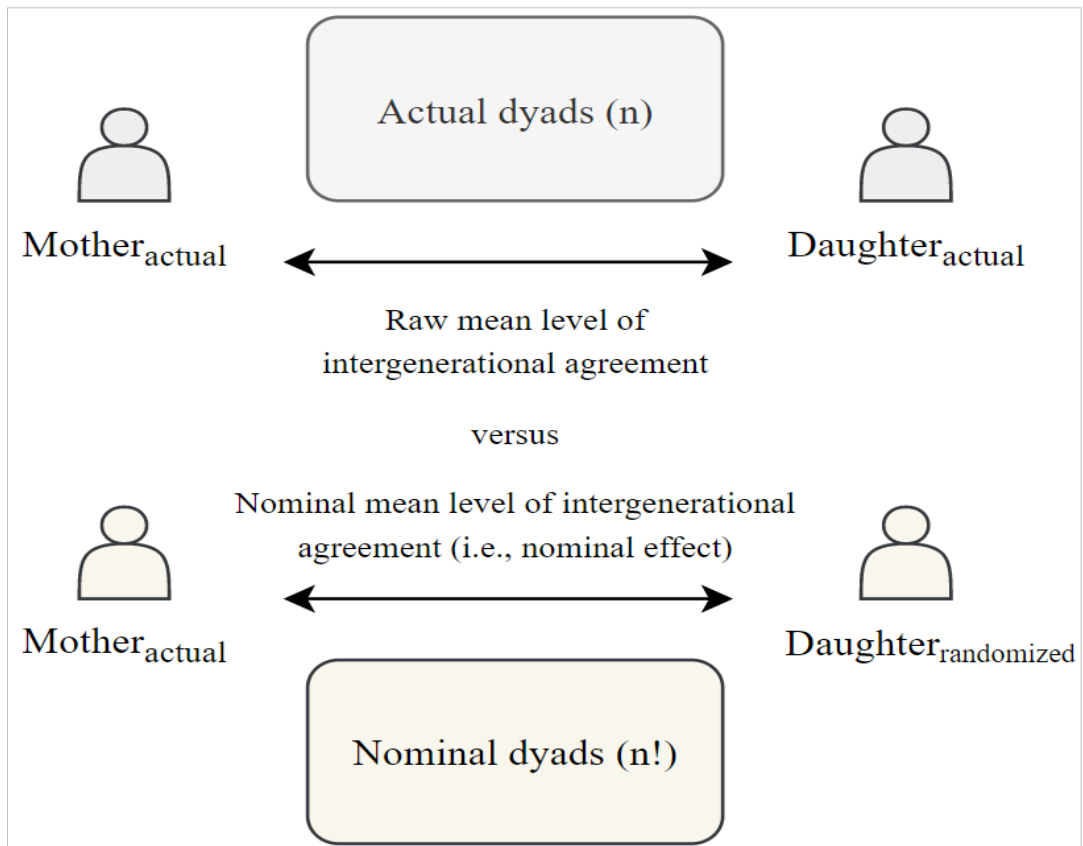
Figure 3. The proposed nominal dyad method approach in line with Mandrik et al. (2005). *Note.* For a specific (n) of mother-daughter pairs, n! represents the total number of possible randomized dyads.

Figure 4. The histogram of nominal effects for sustainable consumer attitudes.

Figure 5. The histogram of nominal effects for sustainable consumer behaviors.

Figure 6. The co-orientational evidence for reverse intergenerational transmission on sustainable consumer attitudes and behaviors (D = daughter, M = mother).

Table 1a. Confirmatory factor analysis on the dyadic dataset: Establishing reliability and validity of focal constructs.

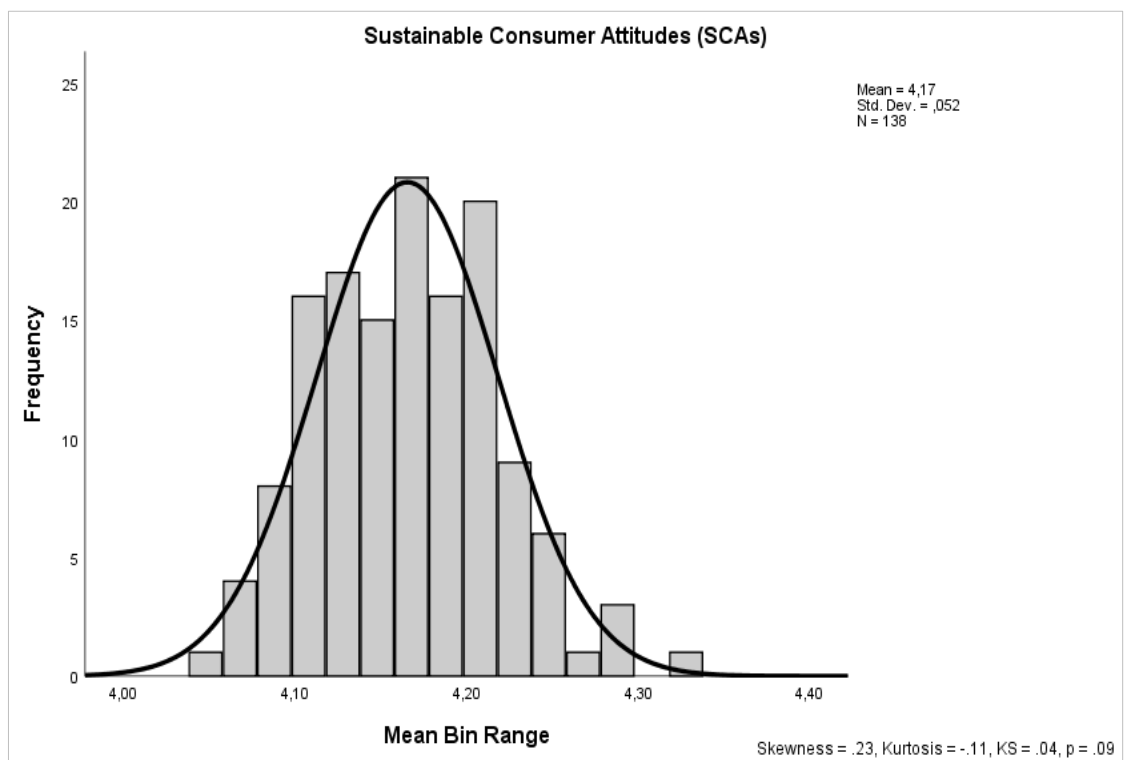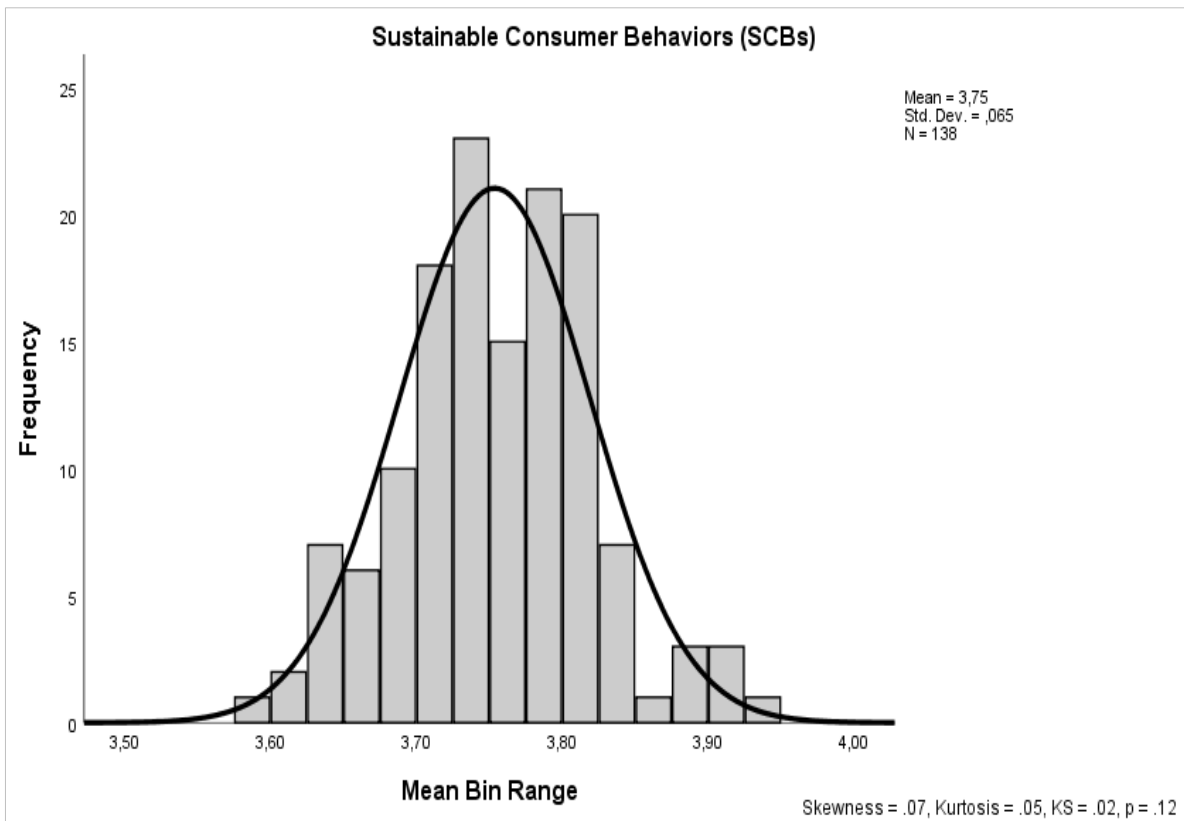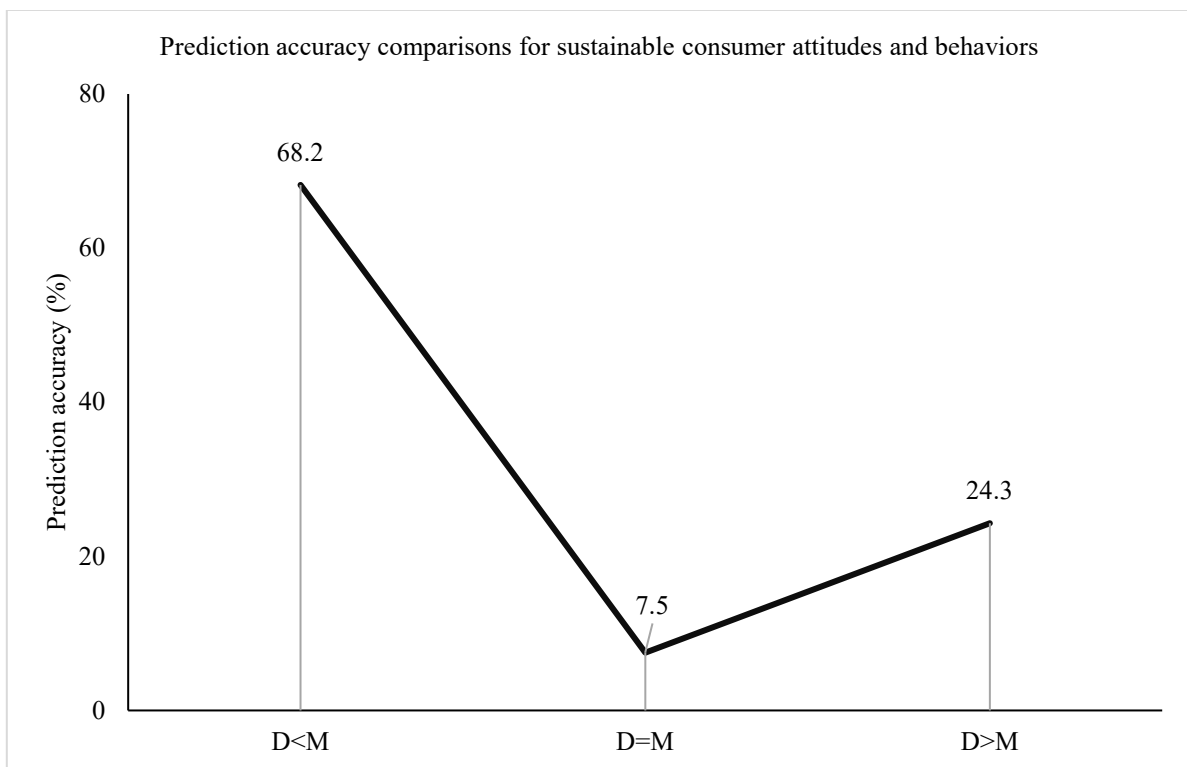| Constructs (items)	Main role	VIF (<3)	Skewness	Kurtosis	Cronbach's α (>0.7)	CR (>0.7)	AVE (>0.5)
Sustainable consumer attitudes (SCAs)	DV	1.64	-.94	1.02	.82	.83	.71
Sustainable consumer behaviors (SCBs)	DV	2.32	-.86	.76	.84	.85	.73
Receptivity to green marketing communications (RGMs)	Moderator	1.96	-.93	.85	.86	.87	.74
Communication effectiveness (CEs)	Moderator	2.25	-1.02	1.13	.79	.81	.72
Green subjective knowledge (GSKs)	Moderator	1.87	-.1.19	1.22	.82	.83	.79
Peer conformity (PCs)	Moderator	2.19	-.75	1.06	.77	.78	.73

Note. DV: Dependent variables, SFLs: Standardized factor loadings, CR: Composite reliability, AVE: Average variance extracted.

Table 2b. Standardized factor loadings (SFLs) of measures.

Constructs	Items	SFLs (>0.7)
Sustainable consumer attitudes (SCAs)	SCA1	.78
	SCA2	.81
	SCA3	.74
	SCA4	.92
	SCA5	.86
	SCA6	.83
	SCA7	.81
Sustainable consumer behaviors (SCBs)	SCB1	.86
	SCB2	.82
	SCB3	.79
	SCB4	.75
	SCB5	.82
	SCB6	.88
	SCB7	.77
	SCB8	.76
Receptivity to green marketing communications (RGMs)	RGM1	.82
	RGM2	.75
	RGM3	.86
	RGM4	.92
	RGM5	.70
	RGM6	.79
	RGM7	.83
	RGM8	.85
	RGM9	.88
Communication effectiveness (CEs)	CE1	.74
	CE2	.89
	CE3	.91
	CE4	.76
Green subjective knowledge (GSKs)	GSK1	.82
	GSK2	.84
	GSK3	.87
	GSK4	.75
	GSK5	.91
	GSK6	.73
	GSK7	.72
Peer conformity (PCs)	PC1	.81
	PC2	.84
	PC3	.71
	PC4	.74
	PC5	.78
	PC6	.73

Table 3. Raw versus nominal intergenerational similarity on sustainable consumer attitudes and behaviors.

Constructs	Mother (M) (Mean, SD)	Daughter (D) (Mean, SD)	t-values	Raw M-D agreement (Mean, SE)	Nominal M-D agreement (Mean, SE)	Mean differences	Nominal vs. raw agreement p-values	r_{raw}	$r_{nominal}$	Z-values
SCAs	4.34 (.59)	4.22 (.64)	.13 n.s.	3.29 (.08)	4.06 (.02)	.77	**	.356	.095	2.28*
SCA1	4.30 (.45)	4.27 (.53)	.50 n.s.	2.76 (.05)	3.65 (.01)	.89	**	.318	.071	2.12*
SCA2	4.12 (.74)	3.95 (.69)	1.90 n.s.	4.07 (.06)	4.52 (.03)	.45	**	.352	.089	2.29*
SCA3	4.41 (.63)	4.37 (.65)	.51 n.s.	3.27 (.03)	3.68 (.02)	.41	**	.390	.091	2.63**
SCA4	4.28 (.69)	4.25 (.68)	.36 n.s.	3.65 (.04)	3.99 (.02)	.34	**	.369	.102	2.34*
SCA5	4.19 (.60)	4.24 (.62)	-.68 n.s.	3.04 (.06)	3.71 (.04)	.67	**	.359	.096	2.31*
SCA6	4.41 (.62)	4.30 (.66)	1.42 n.s.	2.98 (.05)	3.46 (.01)	.48	**	.372	.088	2.48*
SCA7	4.29 (.69)	4.21 (.62)	1.01 n.s.	3.19 (.11)	3.78 (.02)	.59	**	.417	.079	3.01**
SCBs	4.21 (.50)	4.28 (.62)	-.08 n.s.	3.27 (.09)	3.84 (.03)	.57	**	.373	.087	2.52*
SCB1	4.40 (.57)	4.32 (.51)	1.22 n.s.	2.97 (.09)	3.55 (.01)	.58	**	.384	.072	2.73**
SCB2	4.30 (.61)	4.27 (.59)	.42 n.s.	4.07 (.06)	4.68 (.02)	.61	**	.319	.075	2.11*
SCB3	4.21 (.95)	4.15 (.74)	.58 n.s.	3.68 (.04)	4.11 (.04)	.43	**	.421	.085	2.99**
SCB4	4.06 (.68)	4.07 (.71)	-.11 n.s.	3.42 (.10)	4.04 (.03)	.62	**	.364	.076	2.51*
SCB5	4.29 (.75)	4.40 (.50)	-1.43 n.s.	2.75 (.06)	3.31 (.05)	.56	**	.386	.090	2.58**
SCB6	4.25 (.70)	4.22 (.54)	.39 n.s.	2.88 (.05)	3.27 (.03)	.39	**	.319	.076	2.09*
SCB7	4.13 (.53)	4.21 (.65)	-1.12 n.s.	3.27 (.09)	3.91 (.02)	.64	**	.387	.103	2.49*
SCB8	4.23 (.62)	4.25 (.72)	-.25 n.s.	3.06 (.12)	3.65 (.01)	.59	**	.344	.094	2.17*

Note. SCAs: Sustainable consumption attitudes, SCBs: Sustainable consumption behaviors, SD: Standard deviation, SE: Standard error, Unit of analysis: dyads ($N = 138$). Raw and nominal intergenerational similarity values are calculated based on the absolute differences between the mother's response and the daughter's response to a specific item, where a lower number means a higher intergenerational similarity: *Significant at $p < .05$; **Significant at $p < .01$; n.s.: not significant.

Table 4. Effects of receptivity to green marketing communication, communication effectiveness, green subjective knowledge, and peer conformity on raw intergenerational similarity.

Moderators (IVs)	Model 1: DV: Raw mother-daughter similarity (SCAs)					
	Std. coefficients	SE	t-values	Sig.	VIF (<3)	Collinearity
Dyads' receptivity to green marketing communications	.38	.18	2.12	.03	1.18	.84
Communication effectiveness between dyads	.33	.15	2.17	.03	1.12	.90
Dyads' green subjective knowledge	.25	.11	2.42	.02	1.10	.93
Dyads' peer conformity	-.26	.09	-3.96	.01	1.02	.96
	Model 2: DV: Raw mother-daughter similarity (SCBs)					
Dyads' receptivity to green marketing communications	.28	.04	7.05	.01	1.05	.91
Communication effectiveness between dyads	.30	.06	5.09	.01	1.16	.87
Dyads' green subjective knowledge	.37	.05	7.41	.01	1.07	.88
Dyads' peer conformity	-.32	.07	-4.57	.01	1.14	.94

Note. IVs: Independent variables, Std. Standardized, SE: Standard errors, DV: Dependent variable, SE: Standard errors, SCAs: Sustainable consumption attitudes, SCBs: Sustainable consumption behaviors, Unit of analysis: dyads ($N = 138$).

Table 5. Quantifying the direction of intergenerational transmission based on total prediction accuracy scores.

Construct	TPAS$_D$	TPAS$_M$	Mean differences	TPAS$_D$ vs. TPAS$_M$	
	Mean (SE)	Mean (SE)		t-values	Sig.
SCAs	5.86 (.32)	4.12 (.28)	1.74	4.09	.01
SCBs	6.15 (.47)	4.53 (.41)	1.62	2.60	.01

Note. SCAs: Sustainable consumption attitudes, SCBs: Sustainable consumption behaviors, SE: Standard errors, TPAS: Total prediction accuracy score. Lower mean scores indicate higher prediction accuracy for a given construct given that mean scores are based on the absolute value of differences. Unit of analysis: dyads ($N = 138$).

Table 6. Hypotheses result summary.

Hypothesis	Main expectation	Remarks
H$_{1a}$	Intergenerational influence on sustainable consumer attitudes exists between mother-daughter dyad members.	✓
H$_{1b}$	Intergenerational influence on sustainable consumer behaviors exists between mother-daughter dyad members.	✓
H$_{2a}$	Communication effectiveness between mother-daughter dyads amplifies the level of intergenerational similarity on sustainable consumer attitudes.	✓
H$_{2b}$	Communication effectiveness between mother-daughter dyads amplifies the level of intergenerational similarity on behaviors.	✓
H$_{3a}$	Dyads' receptivity to green communication amplifies the level of intergenerational similarity on sustainable consumer attitudes.	✓
H$_{3b}$	Dyads' receptivity to green communication amplifies the level of intergenerational similarity on behaviors.	✓
H$_{4a}$	Dyads' green subjective knowledge amplifies the level of intergenerational similarity on sustainable consumer attitudes.	✓
H$_{4b}$	Dyads' green subjective knowledge amplifies the level of intergenerational similarity on behaviors.	✓
H$_{5a}$	Dyads' peer conformity attenuates the level of intergenerational similarity on sustainable consumer attitudes.	✓
H$_{5b}$	Dyads' peer conformity attenuates the level of intergenerational similarity on behaviors.	✓
H$_{6}$	Intergenerational transfer on sustainable consumer attitudes and behaviors is greater from daughters to mothers than from mothers to daughters.	✓

Appendix A: Focal measurement items used in the present research. All measures are on 5-point scales (1 = Strongly disagree to 5 = Strongly agree).

Measures

Sustainable Consumer Attitudes **(Essiz and Mandrik, 2022) (7 items)**

1) It is important for me to decrease my consumption (use less or avoid buying products) to minimize impacts on the environment.

2) It is important for me that the products I use do not harm the environment.

3) I am concerned about wasting the resources of our planet.

4) I show a serious effort to consume less to preserve our resources for future generations.

5) I would describe myself as an environmentally responsible person.

6) I feel a sense of responsibility for small growers and workers in lower-income countries that produce the things I buy.

7) I believe it is a good idea to introduce labels indicating the climate-friendliness of products.

Sustainable Consumer Behaviors **(Essiz and Mandrik, 2022) (8 items)**

1) I limit my use of energy such as electricity, natural gas, and fossil fuel consumption to reduce my harm to the environment.

2) I avoid buying products that pollute the water.

3) I recycle the materials I use (metals, papers, and plastics).

4) I normally make a conscious effort to buy products from recycled materials.

5) I ride a bicycle or use public transportation to reduce the impact of air pollution.

6) I donate to charities clothes that I no longer wear.

7) I am willing to pay a higher price to buy environmentally friendly or sustainably sourced products.

8) When buying foods, I pay attention to "fair trade labels" indicating that people growing and working in food production are treated fairly.

Communication Effectiveness Between Dyads **(Essiz and Mandrik, 2022) (4 items)**

1) I can discuss my consumption-related beliefs with my mother without feeling restrained or embarrassed.

2) My mother and I really understand each other well.

3) Over the years, my mother and I have established good communication.

4) There has been open communication between my mother and me over time.

Dyads' Receptivity to Green Marketing Communications **(Bailey et al., 2016) (9 items)**

1) I support brands that support the environment.

2) I tend to pay attention to advertising messages that talk about the environment.

3) The use of green messages in ads affects my attitude toward the ads.

4) I respond favorably to brands that use green messages in their advertising.

5) I am the kind of consumer who responds favorably when brands use green messages in their ads.

6) I think that green advertising is valuable.

7) Green advertising is a necessary form of advertising.

8) I am the kind of consumer who is willing to purchase products marketed as being green.

9) I tend to pay attention to green advertising messages.

Dyads' Green Subjective Knowledge **(Essiz et al., 2023) (7 items)**

1) I do not feel knowledgeable about green consumption practices and sustainability overall.

2) Among my circle of friends, I am one of the experts on green consumption.

3) I am familiar with the concepts of social and environmental justice.

4) I am familiar with processes related to recycling, sustainable giving, and organic waste composting.

5) I think I know how to judge the quality of a green product.

6) I think I know enough about green products to feel pretty confident when I make a purchase.

7) I can tell if a green product is worth the price or not.

Dyads' Peer Conformity **(Lennox & Wolfe, 1984) (6 items)**

1) My behavior often depends on how I feel others wish me to behave.

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.

3) When I am uncertain how to act in a social situation, I look to the behavior of others for cues.

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.

5) It is important to me to fit into the group I am with.

6) I try to pay attention to the reactions of others to my behavior to avoid being out of place.