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The Role of Emotional Intelligence in Sustainability Behavior: A Structural Equation Modeling Approach

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Abstract

Sustainability Consciousness (SC) refers to the individual's awareness of sustainable development (SD). This concept describes thoughts, opinions, or ideas (cognitive), emotions, moods or feelings (affective) that may be enduring positive or negative, fostering beliefs and actions toward social (SO), environment (EN), and economic (EC) dimensions of SD. This study examined the role of Emotional Intelligence (EI) in shaping sustainability behavior through sustainability knowingness and attitudes. Using Structural Equation Modeling (SEM), we analyzed data from 241 participants aged 11-18 ($M = 16.84$, $Sd = 1.70$), male and female, from partner communities of a university in Manila. Filipino Sustainability Consciousness Questionnaire (F-SCQ) and self-made Emotional Intelligence questionnaire were used as instruments to achieve the objectives of the study. Results showed that all four latent variables satisfy the usual criteria for both convergent and discriminant validity. First, the measurement scales are internally consistent: Cronbach's alpha ranges from 0.798 (BE) to 0.947 (KN), comfortably exceeding the 0.70 benchmark. Second, convergent validity is confirmed because the Average Variance Extracted (AVE) for each construct is well above the recommended 0.50 threshold, varying between 0.709 and 0.905. Taken together, these results provide strong evidence that the measurement model is both reliable and valid. The results from the serial mediation analysis demonstrate that emotional intelligence significantly influences sustainability behavior through the

mediating roles of sustainability knowingness and sustainability attitude. Specifically, Emotional Intelligence has a significant indirect effect on Sustainability Attitude through Sustainability Knowingness ($\beta = .280$, $t = 4.81$, $p < .001$), suggesting that greater emotional intelligence enhances individuals' knowledge about sustainability, which in turn strengthens their attitudes toward it. These findings emphasize the need for sustainability programs that integrate both cognitive and affective approaches to enhance pro-sustainability behaviors.

Keywords: Sustainability consciousness, Emotional intelligence, Structural Equation Modeling Approach, Filipino Sustainability Consciousness Questionnaire (FSCQ), Theory of Planned Behavior

Introduction

Sustainability Consciousness (SC) refers to the individual's awareness of sustainable development (SD). This concept describes thoughts, opinions or ideas (cognitive), emotions, moods or feelings (affective) that may be enduring positive or negative, fostering beliefs and actions toward social (SO), environment (EN), and economic (EC) dimensions of SD. Consciousness reflects the three psychological constructs of knowledge (K), attitudes (A), and behaviour (Gericke et al., 2019, cited in Rada & Nieva, 2024).

Notably, researchers investigated separately the different dimensions of SD in relation to other variables such as: environmental knowledge and personality traits (Zeng, Moore and Rothenberg, 2024), socio-economic system and personality traits (Nikonova and Krasilnikova (2022) emotional intelligence and personality traits toward sustainable organizations (Di Fabio & Saklofske, 2019), pro-social personality traits and pro-environmental attitude that are determinants to pro-environmental behavior and empathy (a facet of emotional intelligence) as a pro-social behavior (Kesenheimer and Greitemeyer, 2021) but not subsuming all the variables under the current study. A systematic review about pro-social behavior, personality traits, specifically, the five-factor model of personality, and emotional intelligence, covering only five articles included in the final selection out of 217 articles screened, reflects the scarcity of the research on these topics within the literature on pro-environmental behavior (Lisboa, Gómez-Román, Guntín, and Monteiro, 2024). Yet, to date, no study has covered the three psychological constructs of knowledge (i.e., only environmental knowledge/awareness), attitude (only pro-environmental attitude - PEA), and behavior (i.e., only pro-environmental behavior - PEB) of the social (i.e., pro-social personality traits, pro-social behavior), economic, and environmental dimensions of SD.

The current study hopes to support the design of sustainability-promotion programs covering all its dimensions, catering to aspects of emotional intelligence (EI). “Emotional intelligence (EI) has emerged as a promising foundation and resource for the promotion of healthy and sustainable organizations.... This concept [sic] is associated with perceived social support, a variable that regards relational aspects. EI has also emerged in the literature as associated with well-being linked with positive inter- and intrapersonal relationships. Good health and well-being represent one of the seventeen key sustainable development goals of the Agenda 2020–2030 of the United Nations, with the aim of a good quality of life for all people” (Di Fabio & Saklofske, 2019a).

Historically, Greek philosophers, such as Aristotle and Descartes, associated the term intelligence with cognitive aspects. During the early 20th century, the era of the intelligence testing movement, E.L. Thorndike emphasized the theory of 'social intelligence,' which is defined as the ability to get along with

others. It was in 1940 when two types of intelligence were described as 'intellective' and 'non-intellective' under the theory of intelligence quotient (IQ). Emotional Intelligence falls under the non-intellective type, defined as social-emotional skills (retrieved from www.ijbssnet.com). Later, they redefined the non-intellective intelligence in relation to a person's emotions, attitude, and behavior. Then Howard Gardner introduced the theory of "multiple intelligences" in 1983, consisting of seven aspects (cognitive ability, math, kinesthetic, spatial, musical talent, verbal, and communication). In the same year, Gardner included interpersonal intelligence, which relates to a person's capacity to understand others' emotions to maintain order in daily encounters. In 1990, Mayer and Salovey assigned the letters EI instead of EQ.

Beginning in 1990 with their first publication using the term "emotional intelligence," Mayer and his colleagues have been trying to develop what they refer to as an "ability test."

Di Fabio & Saklofske (2019b), in another study, also assessed the contributions of emotional intelligence to Intrapreneurial Self-Capital (ISC), which is a research area of the psychology of sustainability and sustainable development. It concludes that EI explained additional variance in ISC.

Quilon (2024) concluded in her study that emotional state about nature has a role in psychological well-being. She further confirmed that working women who were caring for the environment can handle and regulate their emotions as well as others and have positive perceptions of situations as opportunities to grow and focus on their goals, alongside being mindful of the welfare of others.

Importantly, empathy (an aspect of EI) and altruism were linked to pro-environmental behavior (Kesenheimer & Greitemeyer, 2021; Zeng, Moore & Rothenberg, 2024). Notably, these studies account for the contributions of EI to the strategies in line with SD. However, EI was not presented exhaustively in publications in relation to sustainability consciousness.

The Filipino Sustainability Consciousness Questionnaire (F-SCQ) (Rada & Nieva, 2024) and a self-made Emotional Intelligence questionnaire (Rada & Manansala, 2018) served as the instruments to pull off the objectives of the study. Specifically, the study aims to: 1) Identify emotional intelligence dimensions that describe sustainability consciousness. 2) Analyze the relationship between emotional intelligence and sustainability consciousness. 3) Present insights about emotional intelligence dimensions that support sustainability consciousness to promote both personal well-being and healthy and sustainable organizations.

Consequently, the present study hopes to contribute to a deeper understanding of these psychological constructs (i.e., knowledge, attitude, and behavior) and offers new insights that may catalyze for program implementation to promote both personal well-being and healthy and sustainable organizations.

Theoretical and Conceptual Framework:

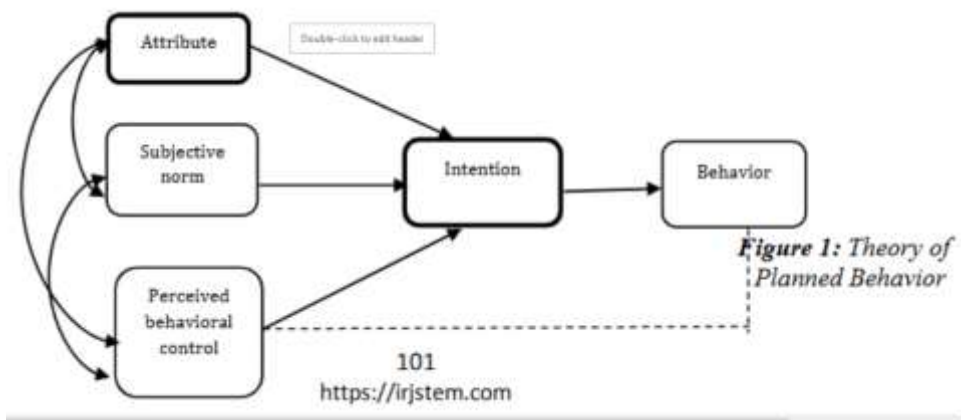
Theory of Planned Behavior

The theory of planned behavior (TPB) was first proposed by Icek Ajzen (1985, cited in Ibrahim, Albattat & Khatibi, 2021) in his article “From Intentions to Actions: A Theory of Planned Behavior”. This theory has attitude, subjective norm, perceived behavioral control, which leads to intention and eventually to behavior (Hasan, Abdullah, and Lew, 2019 as cited in Ibrahim, Albattat & Khatibi, 2021; Figure 1).

Researchers explained theory of planned behavior or TPB as attitude which explains the degree to which a person has a positive/favorable or a negative/unfavorable evaluation/appraisal/feeling towards a certain behavior while subjective norms refer to the perceived social pressure from significant others to perform or not to perform the behavior while the perceived behavior control is perceived ease or difficulty or impact of perceived abilities and barriers performing the behavior and the result of these three elements will lead in the intention and finally to do the action (Meng & Cui, 2020 as cited in Ibrahim, Albattat & Khatibi, 2021; Ermac, 2018, pp. 16-17; Teo, Koh, & Lee, n.d.; Liem & Bernardo, 2010, p. 128) That is, people intend to perform a behavior when they evaluate it favorably, when they experience social pressure to perform it, and when they believe they have the capacity to do so (Ajzen, 2005 as cited in Liem & Bernardo, 2010, p. 128).

Figure 1.

Theory of Planned Behavior



Source: Diagram was taken from Ibrahim, S., Albattat, A, & Khatibi, A. (2021).

Emotional Intelligence Theory

The concept of emotional intelligence integrates two distinct and dichotomous elements of feeling-thinking, affect-cognition, and heart-head (a thinker-with-a-heart). This dichotomy is supported by the very definition of emotion. "Emotions are complex organizations of the physiological, emotional-experiential, cognitive, and conscious aspects of mental life." (Bar-On & Parker, 2000, p. 109) Similarly, emotion is defined as an organized response system that coordinates physiological, perceptual, experiential, cognitive, and other changes into coherent experiences of moods and feelings. The emotion system involves internal experiences that arise in response to models of external relationships." (p. 98) Emotion may be a universal concept, but the manner of expression differs according to individual perspective. Since individuals vary in exposure, environmental demands, social relationships, cognitive functioning, and cultural framework, emotional responses also vary. The other concept, intelligence, has many different definitions, but the central ones always place a primary emphasis on abstract reasoning and may, secondarily, refer to adaptation (Bar-On & Parker, 2000, p. 323).

Emotional intelligence, as an integrated construct also has varied definitions. E. L. Thorndike termed it "social intelligence," which incorporates complexities in a person's capacities; Gardner and Goleman referred to it as intrapersonal and interpersonal intelligences; as practical intelligence to Sternberg, and so on.

There are a lot of other meanings attached to emotional intelligence: as zeitgeist (cultural trend), as personality in Goleman's measure, and as a mental ability in Mayer, Salovey & Caruso's inventory.

Emotional intelligence as a zeitgeist sparked a debate between emotion and intelligence that brought about cultural tensions, insofar as Western thought is concerned. First, the term is considered an oxymoron since emotions convey the idea of unreasonableness in contrast to abstract thinking that defines intelligence. Second, it created a tension between egalitarianism and elitism. Being intelligent is tantamount to being elitist with high self-regard. But it was established that having emotional intelligence can be as powerful or even more powerful than IQ. Later, the cultural spirit of emotional intelligence was accepted as egalitarian, as its zeitgeist value, for it can be learned.

Emotional intelligence as personality involves processes such as motivation, emotion, cognition, and consciousness (Bar-On & Parker, 2000). Emotional intelligence is a cognitive-experiential domain of personality psychology that focuses on the cognition and subjective experience, such as conscious thoughts, feelings, beliefs, and desires about oneself and others (Munarriz & Cervera, 2013; Larsen & Buss, 2010).

Emotional intelligence is also stressed by Mayer and Salovey to consist of mental abilities, skills, or capacities that should be operationalized distinctively from other intelligences. In this sense, Mayer and Salovey offer a restrictive model, while other proponents such as Goleman and Bar-On combine skills that can be characterized as mental abilities and personality traits in the emotional intelligence construct (Punia, Dutta, & Sharma, 2015, p. 980; Bar-On & Parker, 2000).

Several facets and clusters constitute EI in different literatures. Dr. David A. Whitten in his book "Developing Managerial Skills" in 1946 at University of Michigan outlines four major competencies of EI: Emotional awareness - accurate insight of one's own moods and emotions, Emotional control (balance) - impulse control action more fitting to the situation, Emotional diagnosis (empathy) - the ability to evaluate and recognize emotions, and Emotional response - an appropriate reactions or feelings to certain thoughts or manners.

Mayer and Salovey developed their EI framework based on four levels of concepts: emotion appraisal, use of emotion to enhance cognitive processes and decision making, the ability to understand and analyze emotions, and emotion regulation (Winston & Hartsfield, 2004).

Daniel Goleman, a psychologist at Harvard, adopted and expanded the work of Mayer and Salovey, emphasizing the importance of EI. In 1998, he created five EI domains: self-awareness, self-regulation, motivation, social skills, and empathy. The five domains include 25 competencies and consist of a personal theory of performance containing a set of guidelines for effectiveness and competencies for individual development (Punia, Dutta, & Sharma, 2015).

Relevantly, a Theory of Emotional Intelligence was used in the study as an integrated construct of different factors and facets of emotional intelligence from a review of local and foreign literature. A facet refers to a variable representing a narrow and highly homogenous subset of affective, behavioral, or cognitive tendencies associated with a given construct." The term factor is used "to designate a variable that subsumes the common, construct-related variance of several facets." (Seigling, Petrides, and Martskvishvili, 2015) The Emotional Intelligence test assesses a person's ability or set of skills in dealing with one's own and others' emotions, in regulating and using emotions for effective relationships. (Seigling, Petrides and Martskvishvili, 2015) The self-made EI test (Rada & Manansala, 2018) has come up with five dimensions: Emotional Self-Awareness is having insights into one's own moods and emotions in a precise and accurate manner. It is the ability to perceive, evaluate, and express emotions within one's cognitive domain (retrieved from www.ijbssnet.com; Lam & Kirby, 2002; Romanelli, Cain, & Smith, 2006; Crowne, 2013; Wang, Xie, and Cui, 2016). Emotional Self-Control is a competency of an individual in understanding varied emotions and acting on what is called for in the given situation. It improves one's attitude and behavior in the process. An individual with emotional self-control can

organize emotions logically for better judgment and consideration of various points of view (Lam & Kirby, 2002; retrieved from www.ijbssnet.com; Martinez-Pons, 2000; Romanelli, Cain, & Smith, 2006; Petrides, 2016). Adaptability is equated with social intelligence as the ability to manage relationships. It is being able to adapt one's emotions to the situation. It is understanding and managing people and acting wisely in human relations (retrieved from www.ijbssnet.com and www.thomasinternational.net; Petrides, 2016; Crowne, 2013). Empathy is considered interpersonal intelligence, that is, the person's ability to understand others realistically. Thus, the person who possesses this trait can handle and keep relationships with people from different walks of life. It is a social emotion to others or the ability to organize or separate one's emotions and others for better communication (retrieved from www.ijbssnet.com; Lam & Kirby, 2002; Romanelli, Cain, & Smith, 2006; Petrides, 2016). Stress Management or emotional response pertains to reactions or feelings due to excitations brought about by certain thoughts or manners in situations. It is an ability to regulate emotions in oneself and others, especially in handling pressures and stress or developing coping ways. It stresses managing emotions, motivating oneself, and recognizing emotions in others (retrieved from www.ijbssnet.com; Petrides, 2016).

EI includes the ability to perceive, understand, monitor, and regulate one's own and others' feelings and to use this information to guide one's own actions. In the context of a study, a plausible hypothesis is that the ability to manage the emotions associated with environmental protection will allow a person to engage in mechanisms of adaptation, such as PEB. For example, approaches to managing eco-anxiety include the provision of emotional support and emotion-focused interventions. (Baudon and Jachens, 2021, cited in Lisboa et al., 2024). This assigns to EI the important role of not only intervening to mitigate the negative impact of environmental problems on mental health, but also linking EI and the ability to take action for environmental protection. Future research might examine this potential by creating environmental education programs that acknowledge this link. In conclusion, the findings demonstrate the need for further research on the dimensions of emotional intelligence that are associated with PEB, affecting adolescents in a manner consistent with that shown by previous studies to affect adults. This has important implications for research and practice, including for policymakers and/or educational programs' designers on how to design interventions to promote PEB in EI (Lisboa, Gómez-Román, Guntín and Monteiro, 2024, p. 9).

Among several facets (cluster) and factors (competencies) constituting EI, this test consolidates them into five subscales: Emotional Self-Awareness, Emotional Self-Control, Adaptability, Empathy, and Stress Management.

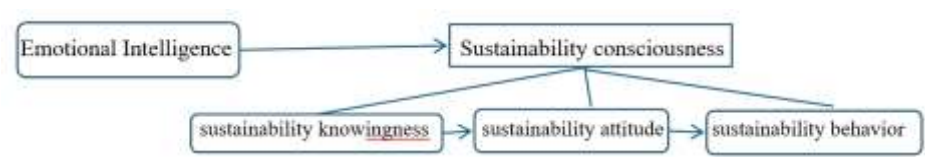
Thus, all the subscales are interrelated, comprising facets and factors on feeling, thinking, and emotions into perceiving (awareness) emotions, using emotions to facilitate thinking (control), understanding (empathy) emotions,

managing (stress management) situations, and acting on emotions wisely (adaptability) in human relations.

Based on the theory of planned behavior which explains attitude as the degree to which a person has a positive or a negative evaluation towards a certain behavior while subjective norms refer to the perceived social pressure to perform or not to perform the behavior while the perceived behavior control is perceived ease or difficulty of performing the behavior and the result of these three elements will lead in the intention and finally to do the action. Thus, this study tried to determine the aspects of emotional intelligence that influence sustainability consciousness, i.e., sustainability knowingness significantly contributes to the formation of sustainability attitudes, which, in turn, exert a strong influence on sustainability behavior (Figure 2). Thus, it was hypothesised that aspects of emotional intelligence account for sustainability consciousness.

Figure 2.

Emotional intelligence and personality traits predict sustainability consciousness. Pathways toward sustainability behavior are also shown.



Methodology

The Filipino Sustainability Consciousness Questionnaire (F-SCQ) (Rada & Nieva, 2024) and the self-made Emotional Intelligence questionnaire) (Rada & Manansala, 2018) served as the instruments to pull off the objectives of the study. The F-SCQ is a Filipino translation of SCQ, developed by Gericke et al. (2019). It is a tool designed to assess a person's understanding and awareness of sustainable development principles. It measures three aspects of Sustainability Consciousness (SC): knowledge (understanding the importance of sustainability), attitudes (feelings towards sustainability), and self-reported behaviors (willingness to take action for a sustainable future). The SCQ encompasses all three dimensions of sustainable development: environment, economy, and society. Reliability estimates of the factors of the scale based on internal consistencies using McDonald's omega and Cronbach's alpha suggest acceptability based on 0.7 criteria. Good-fit indices of F-SCQ are described as follows: Sustainability Knowingness (RMSEA = 0.041, SRMR = 0.015, GFI = 0.997, CFI = 0.991, TLI = 0.988), Sustainability Attitudes (RMSEA = 0.059, SRMR = 0.024, GFI = 0.998, CFI = 0.981, TLI = 0.972) and Sustainability Behaviour (RMSEA = 0.074, SRMR

= 0.036, GFI = 0.996, CFI = 0.949, TLI = 0.923). Self-made Emotional Intelligence Questionnaire, on the other hand, is an integrated construct of different factors and facets of emotional intelligence from a review of local and foreign literature. The subscales were chosen from facets (clusters) and factor (competencies) scales in various research. The test went through a series of reliability and validity testing (Emotional Self-Awareness ($\beta = .723$), Emotional self-control ($\beta = .747$), Empathy ($\beta = .714$), Stress management ($\beta = .780$), Adaptability ($\beta = .849$). The overall score reflects one's own perceived capacity to understand, process, and use information about self and other people's emotions in everyday life. The variables describe one's own strengths and weaknesses in this aspect of human relations. Emotional Intelligence assessment is based on one's skills, knowledge, and experience. Also, it would depend on how one gets on with the people around him/her. The higher the score, the more it would say how much one understands himself/herself and other people. Low score is not about being nice/soft or harsh/callous. It involves knowing how to interact effectively with other people to have sound relationships.

These instruments were developed in different studies, taking into consideration the cultural context of the target populations in the Philippine setting. Nicasio (2012, cited in Rada & Nieva, 2024) posits that "culture plays an important framework in understanding the context of an individual's perspective".

This study is a cross-sectional survey research. In the cross-sectional design, data are collected at a single moment in time from participants to assess and analyze the associations of emotional intelligence and sustainability consciousness. The stratified random sampling design was adopted for the study to ensure that each number targeted in the population has an equal probability of being selected. The stratified random sampling design was adopted for the study to ensure that each number targeted in the population has an equal probability of being selected. Stratified random sampling is a method of selecting a sample in which researchers first divide a population into smaller subgroups, or strata, based on shared characteristics of the members and then randomly select from each stratum to form the final sample (<https://www.simplypsychology.org/stratified-random-sampling.html>). These shared characteristics can include gender, age, sex, race, education level, or income. Power analysis using G*Power 3.1 (Faul et al., 2009) indicates that estimates for a 10% dropout rate suggest that a total of 163 participants need to be recruited to achieve adequate power to trace moderate correlations. This method will provide a representative sample and allow for valid and reliable statistical inferences. Invitations containing the link to the online survey were forwarded through email or social networking sites. At the beginning, an informed consent form about the purpose of the study, confidentiality of information provided, and the voluntary status of participation in the study appeared before proceeding to the online survey.

Grammarly was used solely as an AI-powered writing assistant for proofreading and enhancing clarity, and it was not employed for content generation.

Adolescents (N = 241) aged 11 – 18 (Lisboa et al., 2024) from partner school-communities of a university in Manila; out-of-school and in-school, male and female, completed validated measures of EI and F-SCQ. Descriptive statistics, reliability estimates of the factors of the scales based on internal consistencies using Cronbach’s alpha, and Structural Equation Modeling (SEM) were conducted using SmartPLS to examine the relationships among these variables. Bootstrapping (5000 resamples) was used to assess indirect effects.

Findings

Descriptive Statistics, Reliability, and Validity

Table 1.

Descriptive Statistics of Population Sample

Gender				Age		
		Frequency	Percent		Frequency	Percent
Valid	Female	151	62.7	11	3	1.2
	Male	90	37.3	12	2	0.8
	Total	241	100	13	9	3.7
				14	8	3.3
				15	29	12
				16	38	15.8
				17	19	7.9
				18	121	50.2
				19	12	5
N	Valid	241			241	100
Mean		1.3734			16.8382	
Std. Deviation		0.48473			1.69643	
Skewness		0.527			-1.211	
Std. Error of Skewness		0.157			0.157	
Kurtosis		-1.737			1.03	
Std. Error of Kurtosis		0.312			0.312	

The respondents are female-dominated with 151 (62. 7%) and 90 (37.3%) males who are willing to participate. They have age ranges (M = 16.84; Sd = 1.70) from 11-19, as suggested by Lisboa et al (2024), that adolescents can be potentially influenced to actively engage in sustainable consumption. Skewness indicates more participants are at the higher end of the age range (18 - 50.2%; 16 = 15.8%,

15 = 12%). Kurtosis (1.03) is mildly leptokurtic, meaning slightly peaked than normal.

Table 2.

Reliability and Validity Indices of Variables

Convergent Validity			Discriminant Validity			
Latent Variable	Cronbach Alpha	Average Variance Extracted (AVE)	EI	AT	BE	KN
EI	0.926	0.771	.878			
AT	0.881	0.893	0.248	.945		
BE	0.798	0.709	0.381	0.630	0.916	
KN	0.947	0.905	0.327	0.856	0.622	.951

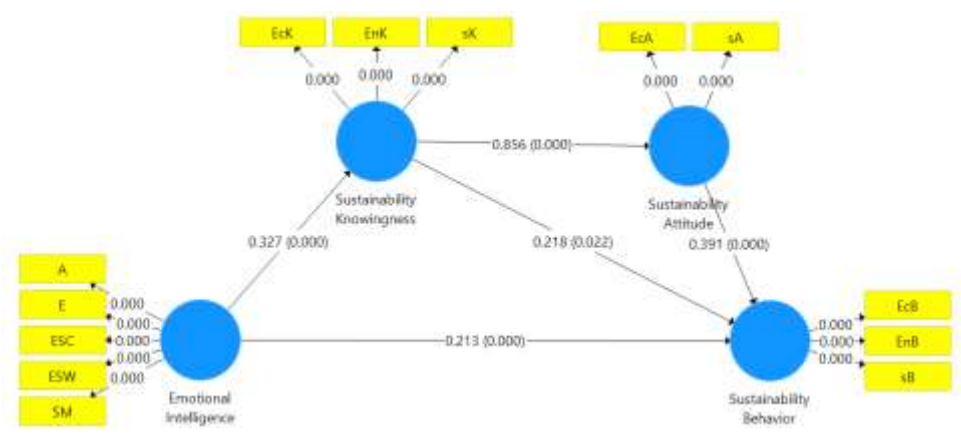
Legend: EI=Emotional Intelligence, KN=Sustainability Knowingness, AT=Sustainability Attitude, BE=Sustainability Behavior

Upon All four latent variables satisfy the usual criteria for both convergent and discriminant validity. First, the measurement scales are internally consistent: Cronbach's alpha ranges from 0.798 (BE) to 0.947 (KN), comfortably exceeding the 0.70 benchmark. Second, convergent validity is confirmed because the Average Variance Extracted (AVE) for each construct is well above the recommended 0.50 threshold, varying between 0.709 and 0.905; this means that each set of indicators captures at least 70 % of the variance in its underlying construct.

Discriminant validity, evaluated with the Fornell–Larcker criterion, is also supported. For every construct, the square root of its AVE (the bold diagonal elements: EI = 0.878, AT = 0.945, BE = 0.916, KN = 0.951) exceeds its correlations with the other constructs (all off-diagonal values are ≤ 0.856). In other words, each construct shares more variance with its own indicators than with any other latent variable in the model, indicating that Emotional Intelligence, Sustainability Attitude, Sustainability Behavior, and Sustainability Knowingness are empirically distinct. Taken together, these results provide strong evidence that the measurement model is both reliable and valid.

Figure 3.

Structural Equation Model Illustrating Relationships Among Emotional Intelligence, Sustainability Knowingness, Sustainability Attitude, and Sustainability Behavior



The above figure illustrates a Structural Equation Model (SEM) that examines the relationships among Emotional Intelligence (Adaptability [A], Empathy [E], Emotional Self-Control [ESC], Emotional Self-Awareness [ESW], and Stress Management [SM]) ; Sustainability Knowingness (Economic Knowledge [EcK], Environmental Knowledge [EnK], Social Knowledge [sK]); Sustainability Attitude (Economic Attitude [EcA], Social Attitude [sA]); and Sustainability Behavior (Economic Behavior [EcB], Environmental Behavior [EnB], Social Behavior [sB]).

Table 3.

Effects of Emotional Intelligence on Sustainability Behavior as Mediated by Sustainability Knowingness and Sustainability Attitude

Path Name	Total Effect			Direct Effect			Indirect Effect		
	Coefficient	t	p-value	Coefficient	t	p-value	Coefficient	t	p-value
EI->KN->AT	.280	4.81	.000	NA	NA	NA	.280	4.81	.000
KN->AT->BE	.553	10.16	.000	.218	2.01	.022	.335	4.15	.000
EI->KN->AT->BE	.394	6.75	.000	NA	NA	.NA	.110	3.06	.001
EI->KN->BE	.394	6.75	.000	.213	3.40	.000	.071	1.83	.034

Legend: EI=Emotional Intelligence, KN=Sustainability Knowingness, AT=Sustainability Attitude, BE=Sustainability Behavior

The results from the serial mediation analysis demonstrate that emotional intelligence significantly influences sustainability behavior through the mediating roles of sustainability knowledge and sustainability attitude. Specifically, Emotional Intelligence has a significant indirect effect on Sustainability Attitude through Sustainability Knowingness ($\beta = .280$, $t = 4.81$, $p < .001$), suggesting that greater emotional intelligence enhances individuals' knowledge about sustainability, which in turn strengthens their attitudes toward it. Moreover, Sustainability Knowingness shows a strong and significant effect on Sustainability Behavior, both directly ($\beta = .218$, $t = 2.01$, $p = .022$) and indirectly through Sustainability Attitude ($\beta = .335$, $t = 4.15$, $p < .001$), highlighting that knowledge not only fosters positive attitudes but also directly translates into sustainable behavioral practices. Importantly, the indirect effect of Emotional Intelligence on Sustainability Behavior via Sustainability Knowingness and Sustainability Attitude in sequence is significant ($\beta = .110$, $t = 3.06$, $p = .001$), indicating that the pathway from emotional intelligence to sustainability behavior operates partly through enhanced knowledge and subsequently improved attitudes. Additionally, EI also predicts Sustainability Behavior through Sustainability Knowingness alone, with both a significant direct effect ($\beta = .213$, $t = 3.40$, $p = .001$) and a smaller but meaningful indirect effect ($\beta = .071$, $t = 1.83$, $p = .034$). Overall, these findings suggest that emotional intelligence positively contributes to sustainable behaviors, primarily through its influence on sustainability-related knowledge and attitudes, with evidence of both direct and serial mediation effects. These findings suggest that individuals with higher emotional intelligence are more likely to have a greater understanding of sustainability issues and engage in sustainable behaviors. Further, the finding aligns with Ajzen's (1991) Theory of Planned Behavior, which posits that attitudes significantly influence behavioral intentions. This suggests that individuals with higher emotional intelligence are more likely to develop sustainability-related attitudes through knowledge acquisition.

This provides strong empirical support for Ajzen's (1991) Theory of Planned Behavior, which posits that knowledge alone is insufficient in predicting behavior—attitudes are a critical intermediary.

These results highlight the importance of both cognitive (knowledge) and affective (attitude) dimensions in promoting sustainable behavior. While Emotional Intelligence contributes to sustainability consciousness, its impact on actual behavior is indirect, mediated by knowledge and attitude formation.

Discussion

Consistent with prior studies, community members often possess substantial environmental knowledge and positive attitudes, yet this does not automatically translate into consistent, sustainable behavior. For example, a survey in a Russian city found that young people knew about eco-friendly practices but often did not apply them systematically. In that community, pro-environmental

actions were encouraged socially (e.g., discussed among friends), yet behavior tended to be limited to easier practices (Shutaleva et al., 2021). This reflects a common pattern in broader communities: individuals may intellectually support sustainability but face an attitude–behavior gap in practice (Denault et al., 2024). Contributing factors include social norms, convenience, and perceived costs. A study in China, for instance, found that frequent social interactions increased low-cost green behaviors (like recycling) but decreased high-cost behaviors that require more effort or resources. This suggests that in community settings, people readily conform to simple, sustainable actions prevalent in their social circle, but more demanding behaviors may be neglected if those around them aren't doing them (Zhu et al., 2021).

Community influences can thus be double-edged: they provide social support for sustainability but can also reinforce the minimum acceptable action. On one hand, a strong sense of community and social cohesion has been linked to greater environmental engagement (Forsyth et al., 2015), and recent work shows that parental and peer modeling can positively shape youth sustainability habits (Lučić & Uzelac, 2024). In one study of young adult households, parents' sustainable practices (descriptive norms) had a significant positive impact on the sustainable behaviors of their children, whereas merely telling youth to behave sustainably (injunctive norms) was less effective (Lučić & Uzelac, 2024). This underscores that community-level behavior change is often driven by observable examples and shared values rather than just information or exhortation. On the other hand, contextual barriers in communities – such as lack of infrastructure, affordability, or competing priorities – can limit the expression of pro-sustainability attitudes (Colombo et al., 2023). Even highly knowledgeable adults might not act sustainably if it is inconvenient or if they don't see others doing so (Shutaleva et al., 2021; Zhu et al., 2021). These findings help explain our observation that community members with high sustainability “knowingness” did not always exhibit commensurate behavior. They also suggest that interventions at the community level should pair awareness campaigns with supportive social and structural conditions, making sustainable choices the convenient and normative option.

Our results on adolescents' sustainability behavior align with a body of recent literature emphasizing adolescence as a pivotal period for developing sustainable habits. Numerous studies since 2019 confirm that adolescents who hold strong pro-environmental attitudes and knowledge tend to report more pro-environmental behaviors (Denault et al., 2024; Robinson et al., 2019). In fact, a large scoping review identified environmental knowledge and pro-environmental attitudes as two of the most commonly cited predictors of adolescent sustainable behavior, alongside perceived control and intentions (Denault et al., 2024). This supports classic theories like the Knowledge-Attitude-Behavior model and Theory of Planned Behavior, and it resonates with our finding that sustainability knowingness correlates with positive sustainability attitudes in youth. For

example, a study of Spanish pre-service teachers found that sustainability knowingness was positively associated with sustainability attitudes, and both were positively (though modestly) related to self-reported sustainable behaviors (Marcos-Merino et al., 2020). Likewise, a survey of Croatian young adults (18–28) confirmed the K-A-B sequence: greater sustainability knowingness led to more favorable attitudes, which in turn predicted higher engagement in household sustainable practices (Lučić & Uzelac, 2024). These convergent findings underscore that building environmental knowledge and concern during adolescence can lay the groundwork for sustainable action.

However, recent research also tempers this optimistic view by highlighting inconsistencies and gaps in the attitude–behavior link among youth. Not all studies find a straightforward relationship. In the scoping review by Denault et al. (2024), several adolescent studies reported non-significant links between environmental knowledge or attitudes and actual behavior, and at least one longitudinal study even found that increases in pro-environmental attitudes did not lead to increased action (and in fact coincided with a slight decrease in sustainable behavior). This counterintuitive result suggests that simply educating or instilling pro-environmental beliefs in adolescents is not always sufficient – a phenomenon widely referred to as the “knowledge-action gap” or “attitude-behavior gap” (Colombo et al., 2023). Adolescents, like adults, can be thwarted by external barriers (lack of opportunities, family support, or resources) and internal factors (habit, apathy, or competing interests). Emotional and motivational factors may be critical in determining whether an informed, concerned teen actually takes action (Ojala, 2021, as cited in Denault et al., 2024). Indeed, Denault et al. (2024) note that adolescents are more likely to act on their climate concerns when given concrete opportunities (e.g., school or community environmental clubs) and when supported by friends and family. Our discussion of adolescent participants reflects this complexity: while their sustainability attitudes were generally positive, translating those attitudes into consistent behavior likely depended on personal agency and supportive environments. This balanced perspective – acknowledging both the positive correlations and the notable gaps – is important for interpreting adolescent sustainability engagement.

A key contribution of our study is the examination of emotional intelligence (EI) in the context of sustainability, an area that has gained attention in recent years. Our findings that emotional intelligence is linked to sustainability attitudes and behavior are strongly supported by emerging research. Robinson et al. (2019) provided initial evidence that adolescents with higher EI tend to have stronger pro-environmental attitudes and are more likely to engage in pro-environmental behaviors. In their “Green Teens” study of Australian high schoolers, both attitudes and behaviors were positively associated with certain EI skills, especially the ability to understand others’ emotions and to manage one’s own emotions (Robinson et al., 2019). Intriguingly, they found that emotional regulation skills predicted pro-environmental behavior above and beyond the

effect of environmental attitude (Robinson et al., 2019). This suggests that an adolescent who can effectively manage impulses and emotions might better follow through on their ecological values, bridging the typical attitude-behavior gap. Our results mirror this pattern: adolescents (and community members) with higher emotional intelligence – particularly those adept at emotional management and empathy – showed more congruence between what they value (sustainability) and what they do.

A recent systematic review by Lisboa et al. (2024) reinforces these findings and offers a nuanced view of how EI interfaces with adolescent sustainability behavior. Lisboa et al. (2024) reviewed studies on personality and EI correlates of adolescent pro-environmental behavior and concluded that emotional intelligence, especially the dimension of emotion management, is modestly but significantly associated with pro-environmental behavior. They note that adolescents who are better at regulating their emotions tend to engage in more sustainable actions, and that certain EI facets may even moderate the link between attitudes and behavior (Lisboa et al., 2024). Our discussion integrates this idea of moderation: it could be that emotional skills help adolescents act on what they know is right. For instance, feeling empathy for others (human or animal) might strengthen one's pro-environmental attitudes, while skill in handling one's emotions (like eco-anxiety or frustration) may prevent disengagement and encourage practical action (Robinson et al., 2019; Lisboa et al., 2024). Notably, Lisboa et al. (2024) did report one subtle contradictory finding – in the Robinson et al. (2019) data, the trait of emotional control (managing one's own emotions) showed an inverse correlation with pro-environmental attitude. This unexpected result might indicate that some adolescents who are very controlled emotionally could be less outwardly passionate about environmental issues (possibly appearing “colder” in attitude surveys), even as their behavior is responsible. It underlines that the relationship between EI and sustainability is complex: different components of EI can have different effects, and high self-control doesn't necessarily equate to high environmental concern. Despite this nuance, both our results and the broader literature support the overall conclusion that cultivating emotional intelligence can be beneficial for sustainability outcomes, especially in youth. By incorporating emotional competencies (like empathy, emotion regulation, and moral emotions) into sustainability education, communities and schools might better empower individuals to translate their knowledge and attitudes into consistent eco-friendly behaviors (Robinson et al., 2019; Lisboa et al., 2024).

When considering sustainability behavior across both community adults and adolescents, a clear theme is the interplay between cognitive, affective, and contextual factors. Recent studies advocate a more integrated approach: knowledge and awareness (“sustainability knowingness”) provide the foundation, positive attitudes and values provide motivation, and emotional-social factors often provide the push that turns intentions into actions (Marcos-Merino et al.,

2020; Colombo et al., 2023). Our discussion reflects this integration. For example, participants with high sustainability knowingness and consciousness (as in Marcos-Merino et al., 2020) likely had the prerequisite understanding and concern for environmental issues. Many also had favorable sustainability attitudes, echoing widespread findings that today's youth are very concerned about climate change and environmental protection (Denault et al., 2024). Yet, as we observed and as others caution, these internal factors must align with one's emotional capacities and external supports to yield tangible behavior. If an individual feels empowered and emotionally engaged and operates in a supportive community context, sustainable behavior is much more likely (Denault et al., 2024; Lučić & Uzelac, 2024). On the contrary, if they experience eco-anxiety without coping skills, or pro-environmental intent without peer support, a gap can emerge between what they value and what they do (Ojala, 2021; Lisboa et al., 2024).

It is worth highlighting that the most recent evidence supports the positive links among sustainability knowledge, attitudes, and behavior, but some contradictory findings serve as important caveats. On the supporting side, multiple studies across cultures report that environmental knowledge significantly predicts pro-environmental attitudes and behaviors (Marcos-Merino et al., 2020; Lučić & Uzelac, 2024). Our finding of a positive correlation between sustainability knowledge and attitudes is in line with these results. Additionally, the attitude-behavior relationship, while not perfect, is generally positive – adolescents and adults who care more about sustainability tend to act more sustainably (Robinson et al., 2019; Denault et al., 2024). We also found emotional intelligence to be a facilitator, corroborating new research that emotional and social skills can enhance sustainable action (Robinson et al., 2019; Lisboa et al., 2024). On the contradictory side, however, research reminds us of alternative outcomes. Some studies reviewed by Denault et al. (2024) found no significant association between environmental knowledge and adolescent behavior, indicating that awareness alone doesn't guarantee practice. Similarly, instances of attitude-behavior discordance have been documented, where expressed concern does not match behavior due to factors like habit or skepticism about the efficacy of action (Colombo et al., 2023; Shutaleva et al., 2021). Our participants from the community sample exhibited this to a degree – despite identifying sustainability as important, not all engaged in difficult or costly eco-behaviors. Rather than undermining the importance of knowledge and attitudes, these contradictions highlight the influence of mediating and moderating factors. For example, self-efficacy and perceived behavioral control often determine whether attitudes convert to action. If a person doesn't feel their actions matter or feels incapable of making a difference, they may not act (Denault et al., 2024). Likewise, structural barriers (lack of recycling facilities, time, money) can stymie even the well-intentioned individual (Colombo et al., 2023). The balanced perspective, then, is that knowledge, attitudes, and emotional dispositions form a necessary but not always sufficient basis for sustainable behavior – supportive social environments and removal of barriers are critical complements.

Implications and Limitations. The convergence of our findings with recent literature suggests several implications. Education and intervention programs should be holistic, targeting not only cognitive understanding of sustainability issues but also emotional engagement and community support. For adolescents, incorporating emotional intelligence training – such as building empathy for affected communities or future generations and improving emotional regulation in the face of environmental threats – could strengthen the link between what they learn and how they act (Robinson et al., 2019). For communities, leveraging social influence positively (through community leaders, peer educators, or family role models) could help normalize sustainable practices (Lučić & Uzelac, 2024; Shutaleva et al., 2021). The literature also hints at tailoring strategies to behavior type: low-effort behaviors may spread well through simple awareness and social proof, whereas high-effort behaviors might require incentives, infrastructure, or policy support due to the higher personal cost (Zhu et al., 2021).

When interpreting these findings, we must also consider limitations and alternative explanations. Many studies in this domain, including our own, rely on self-reported behavior measures, which can be subject to social desirability or recall bias (Lisboa et al., 2024). Adolescents might over-report “good” behaviors or under-report lapses. Longitudinal and experimental studies are relatively scarce – the bulk of evidence is cross-sectional (Denault et al., 2024) – making it hard to infer causality. It is possible, for instance, that engaging in sustainable activities could itself increase one’s knowledge and strengthen attitudes, rather than the other way around. Future research could explore such reciprocal effects. Another consideration is cultural context: what holds true in one community or country may differ in another. Our discussion has drawn on studies from Europe, Asia, and Australia; encouragingly, the broad patterns (knowledge/attitude-behavior relations) appear across diverse contexts, but specific predictors (like the influence of parents vs. peers, or the role of moral norms) can vary (Denault et al., 2024; Zheng et al., 2022). Additionally, personality traits (e.g., openness, conscientiousness) often correlate with pro-environmental tendencies (Lisboa et al., 2024), which means some of the variance we attribute to emotional intelligence or attitudes might actually be tied to underlying personality dispositions or values. For example, a naturally altruistic or conscientious individual might score high on emotional intelligence and also be inclined toward sustainable behavior – not necessarily because one causes the other, but due to a third-factor trait. We attempted to account for emotional intelligence’s unique contribution, but future work could include broader personality assessments to isolate effects.

Conclusion

The concept of emotional intelligence integrates two distinct and dichotomous elements of feeling-thinking, affect-cognition, and heart-head (a thinker-with-a-heart). This dichotomy is supported by the very definition of emotion. “Emotions are complex organizations of the physiological, emotional-experiential, cognitive, and conscious aspects of mental life.” (Bar-On & Parker, 2000, p. 109) Similarly, emotion is defined as an organized response system that coordinates physiological, perceptual, experiential, cognitive, and other changes into coherent experiences of moods and feelings. The emotion system involves internal experiences that arise in response to models of external relationships.” (p. 98) Emotion may be a universal concept, but the manner of expression differs according to individual perspective. Since individuals vary in exposure, environmental demands, social relationships, cognitive functioning, and cultural framework, emotional responses also vary.

Integrating our findings with recent research reveals a coherent yet complex picture: Sustainability behavior is multifaceted, driven by what people know, how they feel, and the context in which they act. Both supportive and contradictory findings in the literature reinforce the idea that improving sustainability outcomes requires addressing all these facets. Strengthening environmental knowledge and attitudes is crucial, but should be accompanied by developing emotional competencies (like empathy and self-regulation) and by fostering supportive community norms and infrastructures. Such a comprehensive approach is more likely to bridge the gaps between knowing, feeling, and doing – guiding both adolescents and community members toward more consistent and impactful sustainability behaviors.

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