KOCHI UNIVERSITY OF TECHNOLOGY

Social Design Engineering Series *SDES-2024-5*

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December 11, 2024

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Abstract

Generativity, concern and commitment for the next generation, is established to be important for understanding people's behaviors to SDGs. However, little is known about how generativity is related to sustainable food consumption intentions and behaviors. We consider the extended theory of planned behavior (TPB), investigating the question "how generativity matters for consumers' intentions to purchase sustainable foods along with environmental concerns (EC)?" and the hypothesis "prosocial attitudes for future generations (PAF), one measure of generativity, is the key determinant." We employ a field survey, collecting data on the intentions to purchase organic foods (INT), TPB constructs, i.e., attitudes, subjective norms and perceived behavioral controls, PAF and EC with 300 household heads in Bangladesh. We confirm the significance of PAF and EC on top of TPB constructs by testing the causality through partial-least squares structural equation modeling, yielding two main results. First, not only PAF but also EC have substantial positive effects on consumer intentions to purchase organic foods. Second, the relations between PAF and INT as well as those between EC and INT are fully and partially mediated by attitudes, respectively. Thus, PAF and EC are established to be key determinants for favorable attitudes toward sustainable food-purchase intentions. Overall, the results demonstrate that enhancement of people's orientations for future generations and environment is effective at shaping sustainable food cultures and practices, and to this end, some future-studies approaches shall be recommended.

Keywords: Sustainable foods; Purchase intentions; Generitivity; Environmental concerns

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Nomenclature

ATT Attitudes

BDT Taka, Bangladeshi currency

EC Environmental concerns

INT Intentions to purchase organic foods

PAF Prosocial attitudes for future generations

PBC Perceived behavioral controls

PLS-SEM Partial-least squares structural equation modeling

SDGs sustainable development goals

SN Subjective norms

TPB Theory of planned behavior

1 Introduction

Practicing sustainable food consumption is an essential component to minimize environmental impacts and to conserve our planet for future generations (Ivanova et al., 2016, UN, 2024). We are using resources almost twice as fast as the Earth can regenerate them and contributing 34 % of greenhouse gas emissions into the atmosphere through our food systems, causing various environmental impacts, i.e., high global temperature and rising sea levels, to jeopardize the needs of future generations (Grooten and Almond, 2018, Crippa et al., 2021, Lin et al., 2023, UNEP, 2024). Sustainable foods respond to basic needs and improve quality of life, minimizing natural resource consumptions, toxic materials and emissions of waste and pollutants over the life cycle to protect the needs of future generations (Oslo Ministerial Roundtable, 1994, Reisch et al., 2013). In order to achieve economic growth and sustainable development, it is imperative that we promptly change our food consumption by encouraging the purchase intentions of sustainable foods, such as organic foods (Schader et al., 2015, Nguyen et al., 2021, Randall et al., 2024). There are several studies that have examined generativity, concern and commitment for the next generation, as a key for understanding people's sustainable behaviors (Wells et al., 2016, Luo et al., 2023, Wang et al., 2023). This research addresses prosocial attitudes for future generations, one measure of generativity, along with environmental concerns to characterize sustainable food purchase intentions.

The theory of planned behavior (TPB) asserts that the intentions to engage on a behavior can predict people's actual behaviors (Ajzen, 1991, 2015). In this theory, intentions are determined by three conceptually independent sociopsychological constructs, i.e., attitudes, subjective norms and perceived behavioral controls. Attitudes refer to the degree to which a person has a favorable or unfavorable evaluation for performing a behavior, having a more substantial effect on intentions than subjective norms and perceived behavioral controls (Ajzen, 2015, Savari and Gharechaee, 2020). The subjective norms indicate that behavioral intentions are based on the approval or disapproval of some individuals who are important to the person. In addition, perceived behavioral control refers to one's level of perception of ease and difficulty in performing a behavior. Some factors, such as opportunities, resources, time, knowledge and skills, may not be in control but they affect

their intentions. In a variety of contexts, several studies have already demonstrated the predictive efficacy of this theory concerning people's food purchase intentions (Verbeke and Vackier, 2005, Vermeir and Verbeke, 2007, Giampietri et al., 2018, Fleșeriu et al., 2020, Randall et al., 2024). Robinson and Smith (2002) demonstrate that attitudes, perceived behavioral control and subjective norms independently predict purchase intentions of sustainable products. Accordingly, people have a high intention to perform a certain behavior, when they assess the results of the behavior as favorable (attitudes), when they perceive social pressure to perform the behavior (subjective norms) and when they believe that they possess the capability to perform the behavior (perceived behavioral controls).

Lierature reveals that environmental concerns (EC), as an additional domain-specific factor, exert a positive effect on attitudes associated with sustainable foods and the purchase intentions of green products (Kirk and Slade, 2002, Verhoef, 2005, Newton et al., 2015, Goh and Balaji, 2016, Yadav, 2016, Prakash et al., 2023). They refer to the extent to which people are aware of environmental issues and support the attempts, being willing to contribute to the sustainability (Grunert and Juhl, 1995, Dunlap and Jones, 2002, Rhead et al., 2015). Kim and Choi (2005) estimate the causal effect of collectivism, environmental concern and perceived consumer effectiveness on ecological consumption by conducting a field survey at a university, reporting that environmental concerns directly influence sustainable purchase behaviors. Nguyen et al. (2021) have investigated the determinants of consumer intentions to purchase organic meat by conducting a survey with 402 Vietnamese consumers at five food stores and find that consumers who are concerned about environment are likely to possess favorable attitudes associated with organic foods purchase. However, some studies report an insignificant association between EC and behavioral intentions (Smith and Paladino, 2010, Donald et al., 2014, Hwang, 2016). Yadav and Pathak (2016) investigate Indian consumers' intentions to purchase organic foods via a questionnaire survey for 220 young adults. They proclaim that EC does not have any influence on purchase intentions. As the results in the related literature have been inconsistent, it is claimed that further research on the effects of EC on purchasing behaviors is necessary (Kautish and Dash, 2017).

Generativity refers to concern for and commitment to the well-being of future generations (Erikson, 1963, McAdams and Logan, 2004). Erikson (1963)'s theory of human development posits that such a concern encompasses a broad spectrum, extending from the impulse to have children to a willingness to contribute for future generations, thereby closely linking it to notions of social responsibility and agency. Prior research has highlighted the positive role of generativity in characterizing green policy attitudes and various sustainable behaviors, such as environmentalism, reducing household wastes, water and energy saving (Milfont and Sibley, 2011, Urien and Kilbourne, 2011, Alisat et al., 2014, Jia et al., 2015, Wells et al., 2016, Aitken et al., 2020, Watkins and Goodwin, 2020, Sharma et al., 2023). Wang et al. (2023) examine the role of generativity on sustainable behaviors of tourists by conducting a questionnaire survey with 702 on-site tourists in China. They reveal that generative concern positively influences environmentally responsible behaviors. Luo et al. (2023) demonstrate in their field research that generativity has a significantly positive effect on green policy and behaviors, while employees' green attitudes and commitments play a mediating role. Prosocial attitudes for future generations (PAF) are the general sense of responsibility for the community and future generations that are instead central to Erikson's conceptuality of generativity (Erikson, 1963, Morselli and Passini, 2015). It is considered one measure of generativity and is more consistently linked to future orientation than other generativity measures (Morselli and Passini, 2015, Barnett et al., 2021). Syropoulos et al. (2020) find that those who feel responsible towards protecting future generations are reported to have pro-environmental beliefs, intentions and support for environmental policies. Overall, measuring generativity through PAF can be considered crucial to combat societal challenges, such as climate change and the depletion of natural resources, as well as achieving sustainable development goals (SDGs) (Aaldering et al., 2024, Barnett et al., 2021).

Previous studies have established the concept of generativity and confirmed the relationships with several key behaviors to SDGs (Hirose et al., 2023, Sharma et al., 2023). However, little is known about how generativity is related to food consumption intentions and behaviors. Researchers have primarily focused on examining people's purchase intentions and behaviors by ad-

dressing TPB constructs (Al-Swidi et al., 2014, Rana and Paul, 2017, Fleșeriu et al., 2020, Leyva-Hernández et al., 2023). In this study, we focus on the effect of PAF (one measure of generativity) and EC together on top of TPB constructs, examining whether or not they are the drivers for sustainable food purchase intentions. Therefore, we pose a question "how generativity matters for consumers' intentions to purchase sustainable foods along with environmental concerns (EC)?" hypothesizing that PAF is the key determinant. We design and institute a field survey, collecting data on intentions to purchase organic foods (INT), TPB constructs, i.e., attitudes, subjective norms and perceived behavioral controls, PAF and EC, with 300 household heads in Bangladesh. The novelties of this study lie in considering PAF and EC together in a single framework on top of TPB constructs and in testing the causality of sustainable food purchase intentions through partial-least squares structural equation modeling. Addressing the question and hypothesis in the analytical framework shall be beneficial for suggesting a new perspective towards sustainable food cultures and practices as well as tackling issues related to SDGs.

2 Food consumptions in Bangladesh

Up to the mid-20th century, the food system in Bangladesh could be broadly characterized as sustainable, being considered a pre-stage of organic agriculture (MoA, 2016). Farmers used to grow different crops, using organic inputs and depending on the hydrological conditions. A household food consumption pattern was the type of "cereal-sugar-aquatic" with low food consumption quantity from 1961 to 1971 (Jia et al., 2023). To become self-sufficient in food production, Bangladesh entered an era of the green revolution in 1972 and started practicing conventional agriculture systems through the application of chemical fertilizers, pesticides and plant growth promoters, such as hormones (Ferdous et al., 2021). The average application rate of chemical fertilizer on per hectare of arable land was only 16.2 kg in 1970 and it dramatically increases to 384 kg in 2021 (FAO, 2021), targeting the increases in cropping intensity and food production for a growing population. As a result, organic farming took a backseat and consumers began purchasing

nonorganic foods, because of the sheer abundance and low prices. At present, the food preferences of Bangladeshi consumers are mostly centered around cereals, such as rice and wheat, with vegetables, fruits, fish and meat (GoB, 2021, Ishra et al., 2022). The consumption of rice and wheat approximately accounts for 44 % of total food intake per capita per day in 2022. According to the household income and expenditure survey of Bangladesh in 2022, the per capita intake of vegetables and fruits has increased from 0.209 kg to 0.297 kg during the past decade (BBS, 2023). Due to its abundance of rivers and ponds, fish serves as the main source of protein in Bangladesh, meeting 60 % of the country's total animal protein needs (Shamsuzzaman et al., 2020, BBS, 2022). In general, household food cultures and practices in Bangladesh are dominated by nonorganic foods from the conventional agriculture.

Increasing income, population growth and urbanization are now changing lifestyles and, consequently, food consumptions patterns and food systems, turning out to be diversified with increasing total food consumptions (Mottaleb et al., 2018, BBS, 2023, Jia et al., 2023). Multiple studies find that the use of pesticides in agricultural production in Bangladesh is extensive and it encompasses the utilization of highly hazardous chemicals as well as banned pesticides (Akter et al., 2018, Dasgupta and Meisner, 2005, Hasan et al., 2014). As a consequence, there have been several risks to human health and environment, which undermine the safety of foods (Haque et al., 2017, Islam et al., 2021). In response to these outcomes, non-governmental organizations initiated the implementation of organic agriculture in the early 1990s and have continued to increase purchase intentions of organic foods among consumers (Ferdous et al., 2021). Additionally, the government introduced the national organic agriculture policy in 2016, with a focus on promoting sustainable food production and consumption (MoA, 2016). Many consumers embrace the belief that "you are what you eat" and comprehend the meaning of food quality, safety and environmental impacts. This has led to an increase in demand for organic foods, while the market in Bangladesh is in a nascent phase (Ishra et al., 2022, Willer et al., 2024). Overall, the shift in consumption behaviors through favorable consumer attitudes towards organic food-purchase intentions is still urgent for achieving sustainable food consumption (Rana and Paul, 2017, Kabir and Islam, 2022, Akter et al.,

2023).

3 Methods

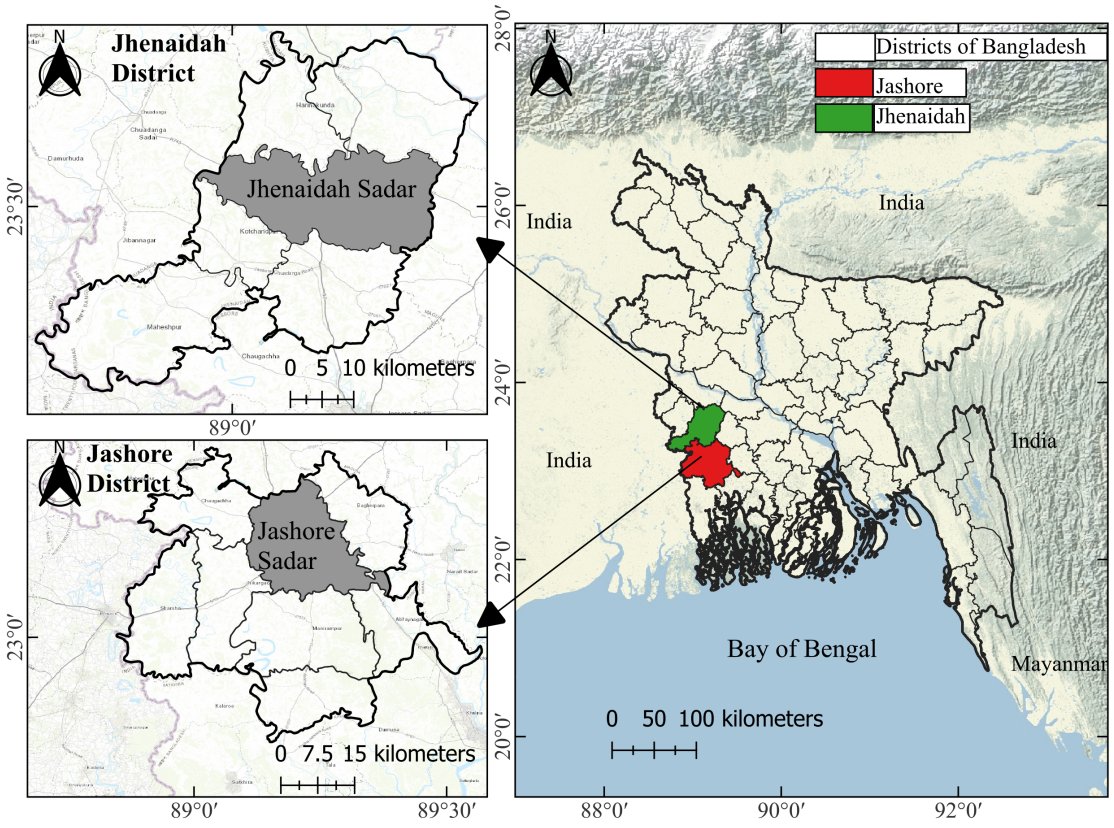
3.1 Study areas, sample and sampling strategy

We selected Jashore and Jhenaidah as our study areas, situated in the south-western region of Bangladesh and considered as a regional agricultural hub (figure 1). Our study areas are the ones of some specific areas in Bangladesh where locally produced foods meet certain requirements for organic foods and people can purchase them in the markets or from the farm gates as their daily practices (Dhaka Tribune, 2014, Musa et al., 2015, Seraj, 2019). The sociodemographic and ethnic profiles of these areas' populations are homogeneous and closely align with the national average (BBS, 2020, 2022). A cross-sectional design was applied to collect data from household heads during the month of January 2023. The household heads were selected by following the stratified random sampling techniques. We randomly selected 150 household heads in each of Jashore and Jhenaidah areas by using the residence list and the random number generators, finally identifying a total of 300 household heads. The 1st author administered the survey, organized and trained local support staffs as well as research assistants. Research assistants contacted the selected household heads, collected written consent and obtained their sociodemographic information, sociopsychological constructs and organic foods purchase intentions by conducting the survey questionnaires. We followed the face to face data collection method and the total questionnaire session took almost 30 minutes to complete. There was a fixed participation fee (= 50 BDT) per household head, transferring to their bank accounts after completing the survey.

3.2 Key variables

A field survey with two-parts questionnaire was conducted for collecting the data of key variables. The first part includes the sociodemographic characteristics of household heads: gender,

Figure 1: The study areas in Bangladesh, Jashore and Jhenaidah



age, household income, education and household members. The second part includes a series of statements designed to measure sociopsychological constructs: attitudes (ATT), subjective norms (SN), perceived behavioral control (PBC), prosocial attitudes for future generations (PAF), environmental concerns (EC) and intentions to purchase organic foods (INT). We assess the constructs by employing multi-item scales, and those are derived from previous research and subsequently adjust for the purposes of this study (see table 1). All measuring items adhere to the principle of construct compatibility and the standards for constructing the theory of planned behavior (TPB) questionnaire (Francis et al., 2004, Fishbein and Ajzen, 2009). Aside from sociodemographic characteristics, all other questions related to measure sociopsychological constructs are designed using a 7-point Likert scale to reduce statistical issues, ranging from 1 (strongly disagree) to 7 (strongly agree) (Fornell, 1992). The measuring items were subjected to back-translation by native speakers to verify that the contents and meanings remain consistent with the original wordings. In the field, there is a lack of access to computers or devices equipped with internet connectivity. Consequently, all the survey procedures were performed manually by the research assistants. The household heads in the study were literate and used writing tools, including pens and papers, to answer the questions. Whenever the household heads had questions, the research assistants address them in a real-time manner.

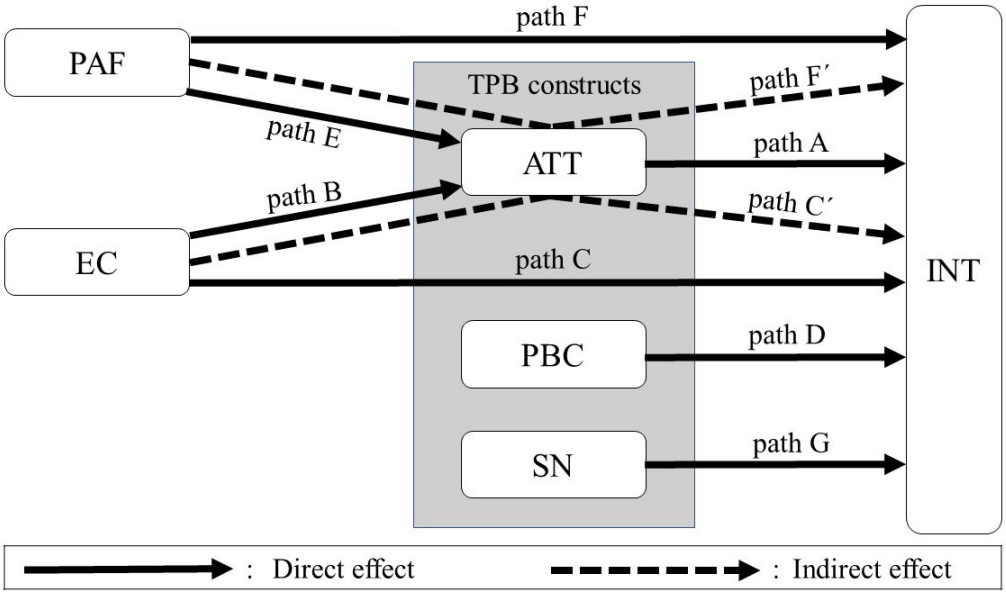
3.3 Statistical analysis

The analyses utilize cross-sectional survey data from two areas, including variables, such as ATT, SN, PBC, EC, PAF, INT and sociodemographic characteristics (table 1 and table 2 provide the definitions of all variables). Descriptive statistics are performed to characterize the sample and the main features of the measures. To estimate the direct and indirect effect of sociopsychological constructs on INT, we apply partial-least squares structural equation modeling (PLS-SEM) by using the software SmartPLS 4 (Savari and Gharechaee, 2020, Sobaih et al., 2023, Salma et al., 2024). It has been widely used in various disciplines characterized by nonnormal data, small sample size and complex model structures (Hair et al., 2014, Dorce et al., 2021). The PLS-SEM

Table 1: Definitions of variables

Variables	Measuring items
Attitudes (ATT)	(Singh and Verma, 2017, Pacho, 2020, Dorce et al., 2021)
	ATT1: I think purchasing organic foods would be pleasant
	ATT2: I believe organic foods is very useful to meet the nutritional needs
	ATT3: I think purchasing organic foods is a good idea
Subjective norms (SN)	(Al-Swidi et al., 2014, Pacho, 2020)
	SN1: People whose opinion I value would generally believe that organic foods are better for health
	SN2: My close friends would appreciate if I purchase organic foods
	SN3: My family thinks that I should buy organic foods rather than nonorganic
Perceived behavioral controls (PBC)	(Al-Swidi et al., 2014, Asif et al., 2018)
	PBC1: I can take the decision independently to buy organic foods
	PBC2: I have the financial capability to buy organic foods
	PBC3: I can handle any difficulties (money, time and information related) associated with my buying decision
Environmental concerns (EC)	(Yadav and Pathak, 2016, Fleșeriu et al., 2020)
	EC1: The balance of nature is very delicate and can be easily upset
	EC2: Human beings are severely abusing the environment
	EC3: Humans must maintain the balance with nature in order to survive
	EC4: Human interferences with nature often produce disastrous consequences
Prosocial attitudes for future generations (PAF)	(Morselli and Passini, 2015)
	PAF1: I carry out activities in order to ensure a better world for future generations
	PAF2: I give up part of my daily comforts to foster the development of next generations
	PAF3: I commit myself to do things that will survive even after I die
	PAF4: I help people to improve themselves
Intentions to purchase organic foods (INT)	(Yadav and Pathak, 2016, Pacho, 2020)
	INT1: I am willing to purchase organic foods in future
	INT2: I will purchase organic foods on regular basis
	INT3: I try to consume organic foods if they are available for purchase

Figure 2: A conceptual framework describing the relationships among attitudes (ATT), subjective norms (SN), perceived behavioral control (PBC), prosocial attitudes for future generations (PAF), environmental concerns (EC) and intentions to purchase organic foods (INT).



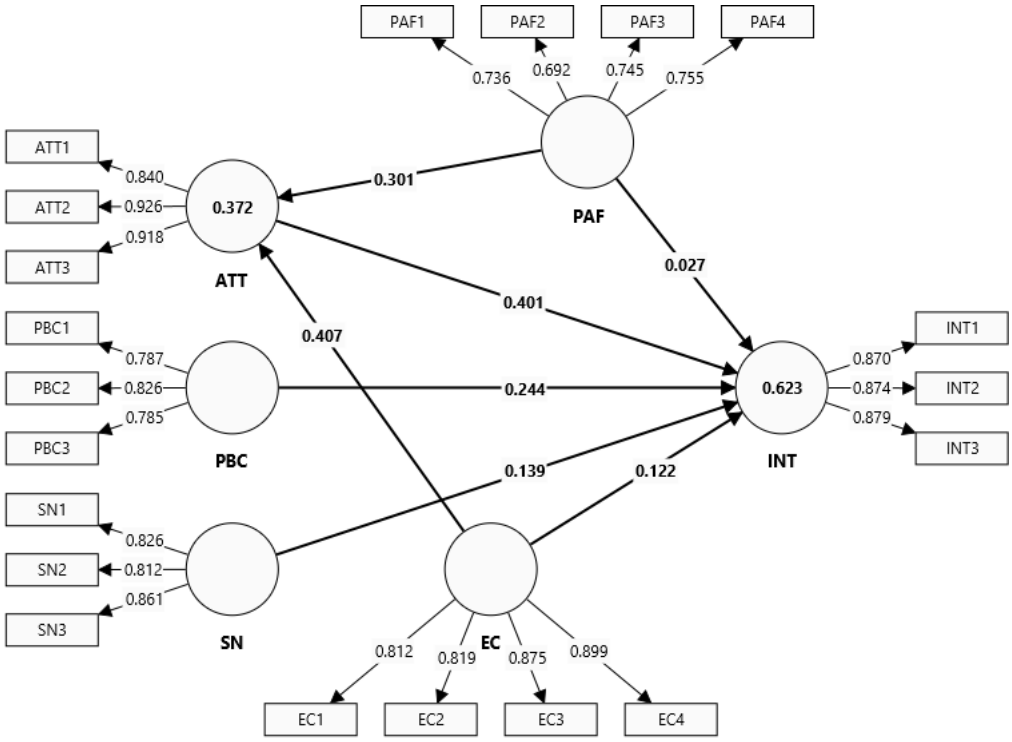
utilizes the items listed in table 1 as reflective indicators for their corresponding constructs, formulating both measurement and structural models (figure 3). A satisfactory measurement model is first established by assessing indicator reliability, convergent validity and discriminant validity. Indicators reliability is confirmed by estimating factor loadings of each measuring items (> 0.5), Cronebach's α (> 0.70) and composite reliability (C.R) (> 0.70) of each constructs. Both convergent and discriminant validity are corroborated by estimating average variance extracted (AVE) (> 0.50) and Fornell-Lacker (square root of each construct's AVE is grater than the correlations with other constructs) and heterotrait-monotrait ratios (HTMT) (< 0.90), respectively. The thresholds of all reliability and validity indicators mentioned in parentheses are predetermined before conducting data analysis based on Hair et al. (2014). The assessment of the structural model relies on the variance inflation factor (VIF) (< 4.00), R^2 and path coefficients. To assess the significance of each path coefficient, we use a bootstrapping procedure with 5000 subsamples and test the mediation effects (Zhao et al., 2010, Dorce et al., 2021)

The conceptual framework in figure 2 visualizes the relationships among sociopsychological

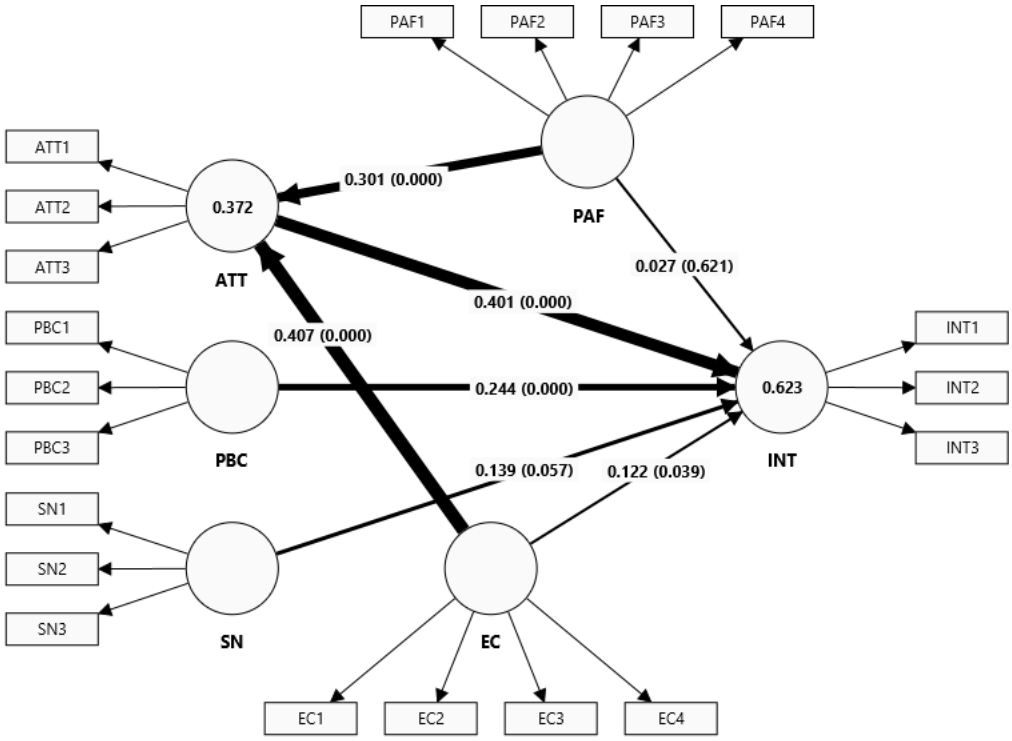
constructs (ATT, PBC, SN, PAF, EC) and intentions to purchase organic foods (INT). We test the direct and indirect relationships among variables using mediation analysis in figure 2 represented by plane and dot arrows respectively. With the framework in mind, our focus is on estimating the path coefficients β^K of each direct (path A: ATT -> INT, path B: EC -> ATT, path C: EC -> INT, path D: PBC -> INT, path E: PAF -> ATT, path F: PAF -> INT and path G: SN -> INT) and indirect paths (path F$'$: PAF -> ATT -> INT and path C$'$: EC -> ATT -> INT) in figure 2, where $K = \{\text{path A}, \text{path B}, \text{path C}, \text{path C}', \text{path D}, \text{path E}, \text{path F}, \text{path F}', \text{path G}\}$. Recall our research question: "how generativity matters for consumers' intentions to purchase sustainable foods along with environmental concerns (EC)?" In this regard, the estimated paths coefficients are key parameters enabling us to answer the research question. Specifically, the hypothesis of our research question is posed as, $H_0 : \beta^K = 0$ while the alternatives are $H_1 : \beta^K \neq 0; K = \{\text{path F}, \text{path F}'\}$. It is expected that PAF has the substantial positive effects on INT so that increasing in people's orientations for future generations can improve favorable attitudes toward sustainable food purchase intention.

4 Results

Sociodemographic characteristics of the 300 household heads are reported in table 2. The sample exhibits gender imbalance, with male-headed household heads being the majority (58 %). Half of the participants are younger than 36 years old. Nearly 80 % of the households earn a monthly income below 31 000 BDT. Regarding education, 82 % of household heads have at least 6 years of schooling. Nearly 60 % of households have 4 to 5 persons as household members. According to the household level data reported by the Bangladesh Bureau of Statistics, a notable increase in female-headed households is observed recently in national level, reaching its highest level (17.4 %) in a decade (BBS, 2022, 2023). Nearly 40 % people in Bangladesh are between 16 to 35 years of age and the literacy rate is 74.66 %. The average monthly household income is 32 422 BDT and the average household size is 4.26 at the national level. In these sense, the results



(a) Measurement model



(b) Structural model

Figure 3: Measurement and structural models for intention to purchase organic foods

can be interpreted that the sample closely mirrors the population of Bangladeshi household heads.

The results in table 3 shows the percentages of household heads who respond with each score (1 to 7) for each measuring item of constructs. In general, the results indicate a tendency towards positive attitudes (ATT), encouraging subjective norms (SN) and slightly high perceived behavioral controls (PBC) and high intentions to purchase organic foods (INT). This is because at least 60 % of household heads give their responses at score 5 or higher for the majority of the statements used to measure these constructs (with the exception of PBC3). The results also expose that the environmental concerns (EC) and prosocial attitude for future generations (PAF) are quite high among household heads, as more than 70 % of them choose responses of 5 or higher for the majority of the of the statements used to measure these two constructs (with the exception of PAF1). Overall, table 3 confirms that household heads exhibit a tendency to choose positive responses of the measuring items regarding all constructs.

Table 4 presents the results of the constructs reliability, convergent validity and internal consistency to assess a measurement model showed in figure 3a. The factor loading values of measuring items, cronbach's α and composite reliability (C.R) values of the constructs range from 0.692 to 0.926, 0.713 to 0.876 and 0.716 to 0.896, respectively. These values are all well above the threshold levels. The values of average variance extracted (AVE) range from 0.536 to 0.801, which is within the acceptable limit of 0.500. The results of discriminant validity are presented in table 5, measuring the values of Fornell-Larcker criterion and Heterotrait-monotrait (HTMT) ratios. In Fornell-Larcker criterion, square root of each construct's AVE (ATT $= 0.895$, EC $= 0.852$, INT $= 0.874$, PBC $= 0.800$, PAF $= 0.732$ and SN $= 0.833$) is grater than the correlations with other constructs. Furthermore, HTMT ratios are in acceptable limits, ranging from 0.560 to 0.895. The predictive value, i.e., R^2, of the model indicates that almost 62 % of the variance in INT is explained by PAF, EC and TPB constructs together. In addition, VIF results indicate no multicollinearity among constructs. Overall, these results can be considered suitable for validating the measurement model.

After obtaining a suitable measurement model, we perform structural model estimation to iden-

Table 2: Sociodemographic characteristics of the respondents

Sociodemographic characteristics	Frequency	Percentage (%)
Gender		
Male	174	58
Female	126	42
Age		
16-25 years old	63	21
26-35 years old	92	31
36-45 years old	77	25
46-55 years old	42	14
56 years old and above	26	9
Household income[a]		
Less than 10 000 BDT[b]	16	5
10000-20 000 BDT	143	47
21000-30 000 BDT	74	25
31000-40 000 BDT	30	10
41000-50 000 BDT	14	5
More than 50 000 BDT	23	8
Education		
1-5 years of schooling	55	18
6-10 years of schooling	105	35
11-12 years of schooling	60	20
Undergraduate or graduate degree	80	27
Household members[c]		
1-3 persons	64	21
4-5 persons	175	59
More than 5 persons	61	20

[a] Monthly household income in BDT
[b] BDT stands for Bangladeshi currency "taka."
[c] Total number of household members

Table 3: Percentage of participants who respond with each score (1 to 7-strongly disagree to strongly agree) for each measuring items.

Measuring items	Scores						
	1	2	3	4	5	6	7
ATT1	1.000	1.333	4.667	16.000	42.333	28.333	6.333
ATT2	0.000	0.333	4.000	19.333	39.333	27.667	9.333
ATT3	0.000	0.000	3.000	13.667	43.333	26.667	13.333
SN1	1.000	2.667	5.333	18.000	48.333	19.333	5.333
SN2	2.667	4.333	8.000	24.667	40.333	15.333	4.667
SN3	0.667	2.000	5.333	11.667	47.000	25.667	7.667
PBC1	2.667	2.333	10.667	12.667	50.667	14.333	6.667
PBC2	2.333	6.667	7.667	9.333	50.333	17.333	6.333
PBC3	2.667	7.333	21.000	26.667	35.333	5.333	1.667
EC1	1.333	1.667	6.333	20.333	45.000	16.333	9.000
EC2	0.667	2.333	3.667	5.667	39.333	33.000	15.333
EC3	0.667	1.000	1.000	7.667	45.333	26.333	18.000
EC4	0.333	1.000	4.333	14.667	44.667	20.667	14.333
PAF1	5.667	4.333	11.667	12.667	43.667	17.667	4.333
PAF2	1.000	1.000	3.000	11.667	50.000	26.333	7.000
PAF3	3.000	1.667	3.000	6.333	48.667	24.667	12.667
PAF4	0.667	1.667	3.667	6.000	48.000	32.333	7.667
INT1	0.333	1.333	2.000	5.333	49.667	28.333	13.000
INT2	1.333	0.000	4.333	9.333	46.333	28.667	10.000
INT3	0.667	0.667	3.667	12.000	46.000	28.000	9.000

Table 4: Construct reliability and validity indicators of the measurement models

Constructs	Measuring items	Factor loading	Cronbach's α	C.R[a]	AVE[b]
Attitude (ATT)	ATT1	0.840	0.876	0.896	0.801
	ATT2	0.926			
	ATT3	0.918			
Subjective norms (SN)	SN1	0.826	0.780	0.779	0.694
	SN2	0.812			
	SN3	0.861			
Perceived behavioral control (PBC)	PBC1	0.787	0.718	0.718	0.639
	PBC2	0.826			
	PBC3	0.785			
Environmental concern (EC)	EC1	0.812	0.874	0.886	0.726
	EC2	0.819			
	EC3	0.875			
	EC4	0.899			
Prosocial attitude for future generations (PAF)	PAF1	0.736	0.713	0.716	0.536
	PAF2	0.692			
	PAF3	0.745			
	PAF4	0.755			
Intention (INT)	INT1	0.870	0.846	0.847	0.765
	INT2	0.874			
	INT3	0.879			

[a] C.R stands for composite reliability (roh a)
[b] AVE stands for average variance extracted

Table 5: Fornell-Larcker and Heterotrait-monotrait (HTMT) criterion for discriminant validity

	ATT	EC	INT	PBC	PAF	SN
	Fornell-Larcker criterion					
ATT	0.895					
EC	0.548	0.852				
INT	0.728	0.540	0.874			
PBC	0.593	0.449	0.643	0.800		
PAF	0.492	0.467	0.490	0.495	0.732	
SN	0.735	0.544	0.681	0.671	0.629	0.833
	Heterotrait-monotrait (HTMT) ratio					
ATT						
EC	0.613					
INT	0.839	0.621				
PBC	0.736	0.560	0.821			
PAF	0.606	0.597	0.628	0.686		
SN	0.881	0.653	0.837	0.895	0.838	

ATT= Attitudes, EC= Environmental concerns, INT= Intentions to purchase organic foods, PBC= Perceived behavioral controls, PAF= Prosocial attitudes for future generations, SN= Subjective norms

[a] C.R stands for composite reliability

[b] AVE stands for average variance extracted

tify the effect of PAF and EC together on top of TPB constructs (ATT, SN, PBC), testing causality on INT through an interplay with ATT (figure 3b). The results presented in table 6 show that most of the path coefficients related to the direct effects of constructs are positive and statistically significant at a 1 to 10 % level. Among the TPB constructs, ATT ($\beta = 0.401, t = 6.035, p < 0.01$) emerged as the most significant determinant of INT followed by PBC ($\beta = 0.244, t = 4.487, p < 0.01$) and SN ($\beta = 0.139, t = 1.901, p < 0.10$), being in line with some previous literature (Dowd and Burke, 2013, Pacho, 2020). Vermeir and Verbeke (2007), Yadav and Pathak (2016) and Dorce et al. (2021) report that the TPB constructs support the sustainable food purchase intentions, measuring the direct effect through structural equation modeling. The results in table 7 show the effect of EC and PAF on INT through an interplay with ATT using mediation analysis. The path coefficients reveal that EC ($\beta = 0.122, t = 2.065, p < 0.05$) has the significant direct effect (path C in figure 2) on INT at a 5 % level. This result is considered another confirmation of how environmental concerns are important for inducing sustainable behavioral intentions (Newton et al., 2015, Goh and Balaji, 2016, Prakash et al., 2023). However, the indirect effects of EC ($\beta = 0.164, t = 4.606, p < 0.01$) and PAF ($\beta = 0.121, t = 3.401, p < 0.01$) on INT through ATT (path C$'$ and path F$'$ in figure 2) are positive and statistically significant at a 1 % level, resulting partial and full mediation, respectively. Overall, PAF ($\beta = 0.148, t = 2.185, p < 0.05$) as well as EC ($\beta = 0.286, t = 4.140, p < 0.01$) have substantial total positive effect on INT.

Overall, it is evident from the summary statistics that the random selection of the sample are effective enough to represent the Bangladeshi household heads. The sample household heads exhibit a tendency to choose positive responses of the measurement items regarding all sociopsychological constructs. We quantify the direct and indirect effects of PAF, EC and TPB constructs through partial-least squares structural equation modeling (PLS-SEM). The estimation results of construct reliability and validity in table 4 confirm a satisfactory measurement model (figure 3a). The results associated with structural model in table 6 and mediation analysis in table 7 provide answers to our research question (how generativity matters for consumers' intentions to purchase sustainable foods along with environmental concerns (EC)?) and support the alternative hypothesis (prosocial

Table 6: Results of the structural model

Paths	Path coefficients (β)	Standard deviation	T statistics
ATT -> INT : path A	0.401***	0.067	6.034
EC -> ATT : path B	0.407***	0.065	6.274
EC -> INT : path C	0.122**	0.059	2.065
PBC -> INT : path D	0.244***	0.054	4.487
PAF -> ATT : path E	0.301***	0.067	4.501
PAF -> INT : path F	0.027	0.054	0.494
SN -> INT : path G	0.139*	0.073	1.901

ATT= Attitudes, EC= Environmental concerns, INT= Intentions to purchase organic foods, PBC= Perceived behavioral controls, PAF= Prosocial attitudes for future generations, SN= Subjective norms
***significant at the 1 percent level, **at the 5 percent level and *at the 10 percent level
[a] C.R stands for composite reliability
[b] AVE stands for average variance extracted

Table 7: Results of the mediation analysis

Hypothesis	Total effects	Direct effects	Specific indirect effects (β)	LCI	UCI	Results
EC -> ATT -> INT : path C′	0.286***	0.122**	0.164***	0.100	0.237	Partial mediation
PAF -> ATT -> INT : path F′	0.148**	0.027	0.121***	0.059	0.197	Full mediation

ATT= Attitudes, EC= Environmental concerns, INT= Intentions to purchase organic foods, PBC= Perceived behavioral controls, PAF= Prosocial attitudes for future generations, SN= Subjective norms

***significant at the 1 percent level, **at the 5 percent level and *at the 10 percent level

[a] LCI stands for lower confidence interval (2.5 %)

[b] UCI stands for upper confidence interval (97.5 %)

attitudes for future generations (PAF), one measure of generativity, is the key determinant) by rejecting the null. It can be concluded that not only PAF, but EC also have substantial positive effects on INT, and relations between PAF and INT as well as EC and INT are fully and partially mediated by ATT, respectively. The results suggest that sustainable food cultures and practices can be improved through increases in people's orientations for future generations and the environment.

Future studies approaches, such as visioning, backcasting, scenario planning and future design, demonstrate how individuals or organizations can be changed to anticipated future trends and make a behavioral and/or strategic shift in a paradigm (Bell, 2009, Amer et al., 2013, Bibri and Krogstie, 2019, Melkonyan et al., 2019, Saijo, 2020, Ziegler and Oliveira, 2022). They are claimed to improve people's perspectives in problem identification and to enhance people's orientations for future generations and environment (Cook et al., 2014, Tuominen et al., 2014, Wodak and Neale, 2015, Lacroix et al., 2019, Timilsina et al., 2020, Pandit et al., 2021, Shahen et al., 2021, Mostafizur et al., 2024). Given the results in this study, it can be said that introducing some future studies approaches in education, i.e., school and family levels, is an effective way to build up the orientations, contributing to the organic foods purchase intentions and behaviors. For example, at the school level, future studies approaches can be integrated to be part of food-intake education, expanding children's perspectives and understanding for sustainability. At the family level, they can also be utilized to induce family members to deliberate about household food problems, thinking about their visions, missions and strategies along with their different perspectives as demonstrated in Mostafizur et al. (2024). Overall, future studies approaches shall be promising for the applications in education, enabling people to be visionary and to shape sustainable food cultures and practices through identifying the problems and forming the habits at school and family levels.

5 Conclusion

This paper has examined the drivers for sustainable food purchase intentions by considering the extended theory of planned behavior (TPB), investigating the question "how generativity matters for consumers' intentions to purchase sustainable foods along with environmental concerns (EC)?" and the hypothesis "prosocial attitudes for future generations (PAF), one measure of generativity, is the key determinant." To this end, we have implemented a field survey for collecting data on intentions to purchase organic foods (INT), TPB constructs, i.e., attitudes, subjective norms and perceived behavioral controls, PAF and EC, with 300 household heads in Bangladesh. The results show that not only PAF, EC also have substantial positive effects on consumer intention to purchase organic foods along with TPB constructs. The relations between PAF and INT as well as EC and INT are fully and partially mediated by attitudes, respectively. Overall, this research identifies an importance of people's orientations for future generations and environment to shape sustainable food cultures and practices, and to this end, some future-studies approaches shall be recommended due to their effectiveness for enhancing the orientations.

We recognize particular constraints in our study and suggest potential avenues for future investigation. First, this research is limited to evaluating the purchasing intentions of organic foods to predict actual purchasing behaviors and consumptions of sustainable foods, which is deemed the most accurate approximation in the context of Bangladesh. While prior research has established a good correlation between behavioral intentions and actual behaviours, future studies must integrate real purchasing behaviors alongside the intentions. Secondly, our research has assessed the purchase intentions of organic foods in general. Future research should gather and analyze purchase intentions for diverse organic items, including meat, fish, vegetables and fruits to ascertain precise outcomes. Third, there may be additional determinants of INT, including trust, health consciousness, labeling and certification, that are not included in this study. We could not able to collect these data due to several constraints that we faced with respect to time, subjects and budgets. Although we acknowledge potential limitations in our research, we assert that it signifies progress in understanding the effectiveness of people's orientations for future generations and environment to

have favorable attitudes toward sustainable food-purchase intentions, and further research on this topic will help reinforce these findings.

6 Acknowledgments

We would like to thank the anonymous referees, Ryohei Hayashi, Yuta Yasui, Husniddin Sharofiddinov, Md. Tawhidul Islam, Pradip Hajong, Abdullah Al Zabir and Dr. Nazim Uddin for their helpful comments, advice and supports. The authors specially thank the Regional Agricultural Research Station, BARI, Jashore, Bangladesh Agricultural Development Corporation, Jashore and Department of Agricultural Extension (Jhenaidah and Jashore) under the Government of the People's Republic of Bangladesh for their support. We are also grateful to the financial support from the Japanese Society of the Promotion of the Science as the Grant-in-Aid for Scientific Research B (19H01485), Research Institute for Future Design and Kochi University of Technology.

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