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Rural High School Students Self-Reported Shopping Frequency for Organic Food Products: The Role of Subjective Norm, Attitudes, Cultural Preferences, School Type and Gender

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ABSTRACT

To contribute to the research gap about the role of adolescents in household purchasing decisions, a survey (n=565) was conducted in Lower Austria in 2018 to investigate rural high school students self-reported shopping frequency for organic food products. The Theory of Planned Behavior, extended with socio-demographic characteristics, cultural preferences and attitudinal variables is used as a theoretical framework. Key findings include the influence of attitude toward organic food products and subjective norm, particularly primary socialization, on self-reported shopping frequency. Socio-demographic characteristics and cultural preferences determine attitudes and have an impact on self-reported shopping frequency.

Keywords*: high school students; organic food products; self-reported shopping frequency; Theory of Planned Behavior; cultural preferences; survey.*

1 Background and Research Problem

Globally, organic farming, organic food production and consumption of organic food products have considerably increased since the 1990s. Austria has already reached the 2030 benchmark of the European Commission to organically farm 25 % of agricultural land in 2019 (Willer et al., 2022). With the second largest share of organic agricultural land (26.5%, after Liechtenstein with 41.6%) and the second highest organic market share (11.3 % after Denmark with 13 %) Austria is at the forefront of organic food production and consumption in the European Union (Bundesministerium für Landwirtschaft, 2018; Willer et al., 2022).

The underlying motivation for consumption of organic food is complex and multifaceted, but most consumers perceive organic food as healthy and environmentally friendly (Cicia et al., 2009; Gundala and Singh, 2021; Hughner et al., 2007)[a]. When it comes to predicting shopping behavior of organic food products egoistic concerns about one's personal or family health were stronger than altruistic concerns for the environment or animal welfare (Gundala and Singh, 2021; Magnusson et al., 2003; Padel and Foster, 2005). This trend towards consuming organic food products for one's own "wellness" or "wellbeing" has been further enhanced by the COVID pandemic as consumers look for healthier nutrition (Willer et al., 2022) and are preparing more food at home.

Despite increased availability and demand for organic food products in Austria, continued positive development of the organic sector is not guaranteed. It is dependent on conducive framework conditions and a balance between availability and demand (Kummer et al., 2021). Children and teenagers play an important role as future consumers of organic food products (Kamenidou et al., 2020). Despite their limited financial means due to their integration into their parents' household, they already influence the family shopping basket, and their preferences are already being formed (Gotschi et al., 2009; Jaeger-Erben et al., 2020; Vogel et al., 2010). Food preferences and eating habits formed in childhood represent the basis and are carried into adulthood (Babio et al., 2014; Branen and Fletcher, 1999; Ensaff et al., 2015). In Austria, a 2017 survey found that 60 % of surveyed teenagers and young adults intended to buy more or significantly more organic food products in the future (Steinwidder et al., 2018). However, little is still known about the linkages between opinions, attitudes and expectations of children and teenagers and their behavior of buying organic food products (Gotschi et al., 2009; Hansen et al., 2018; Stobbelaar et al., 2007; Vogel et al., 2010).

In this article we analyze data (n=565) from a 2018 survey conducted in three vocational high schools in rural Austria to assess socio-demographic and cultural variables with respect to shopping frequency of organic food products. We are using the Theory of Planned Behavior (TPB) (Ajzen, 1991; Ajzen and Fishbein, 1980; Ajzen and Madden, 1986) as a theoretical framework to explore the relations between attitudes (attitude toward organic food products, trust in and knowledge of organic labels), subjective norm, and self-reported shopping frequency for organic food products with an aim to contribute to better understand the motivations and limitations of high school students' shopping behavior for organic food products. In our research model the TPB is modified in the character of the included attitudes and is extended with socio-demographic characteristics of high school students and their cultural preferences to include important explanatory variables according to literature review and research objectives.

While we focus on social, cultural, and psychological factors, we are aware that purchasing decisions are taken in a wider economic and political context. In particular price, product range and availability have an impact on the willingness and ability to buy organic food products (Aertsens et al., 2011; Steinwidder et al., 2018). However, research has shown that consumers are willing to pay a premium for organic food and products that go beyond strict organic food standards provided that the qualities and values are communicated well (Naspetti and Zanoli, 2011).

2 Theoretical Foundations

Attitudes have been of interest in trying to understand human behaviors since the early days of social psychology. In turn, research into peoples' attitudes revealed that these attitudes were formed by beliefs that people have about the qualities of psychological objects (Ajzen, 2012). However, attitudes alone "were usually found to be very poor predictors of actual behavior" (Ajzen and Fishbein, 2005). In the Theory of Reasoned Action (TRA) Ajzen and Fishbein (1980) proposed to use "normative belief" or "subjective norm" (SN) in addition to attitudes towards the behavior of interest. The TRA assumes that close family, friends, peers, or other reference groups/individuals have a normative influence on people's behavior, which people perceive as social norm or social pressure. Further, the TRA assumes that people have volitional control over the behavior in question, limiting the application and scope of the theory (Ajzen, 2012). The TPB, which is amongst the most popular theoretical frameworks to explain human behavior (Ajzen, 2012, 2020), incorporated perceived and actual behavior control to accommodate for ease or difficulty of performing behavior. The TPB further distinguishes between actual behavior and intended behavior, allowing for situations where factors outside of people's control interfere with their intentions to perform behavior (Ajzen, 2012, 2020).

Over the past 60 years, most European societies have experienced significant economic growth leading to improvements in education and increased choices in all aspects of daily life. Class and social strata, it has been argued, have been increasingly replaced by lifestyle and a wide range of possible consumption choices (Mutz and Kämpfer, 2013; Rössel, 2004). Similarly, empirical research in Germany has found that consumption patterns have changed significantly over the past decades, resulting from increased lifestyle choices as well as changing demographics (Hörstermann, 2016).

Lifestyle, though often regarded as a diffuse concept, has received significant attention in sociological literature since the 1990s to help explain social behavior. Otte (2005) suggests that lifestyle, while usually defined as an individuals' expression of subjective behaviors, symbols, preferences, and values (rather than objectively available resources), operates within the general scope of resources available to the individual. In a review of empirical studies, Rössel (2004) finds that "lifestyle" (expressed as patterns of behavior and therefore adherence to a specific social milieu) is not superior in explaining the variance of social behavior compared to socio-demographic variables. While "lifestyle" and "cultural preferences" are highly congruent concepts, Rössel (2004, 2006) has argued the use of "cultural preferences" to be integrated into a model of social behavior because "cultural preferences" can explain social behavior while "lifestyle" in itself is a pattern of social behavior and therefore has no explanatory value.

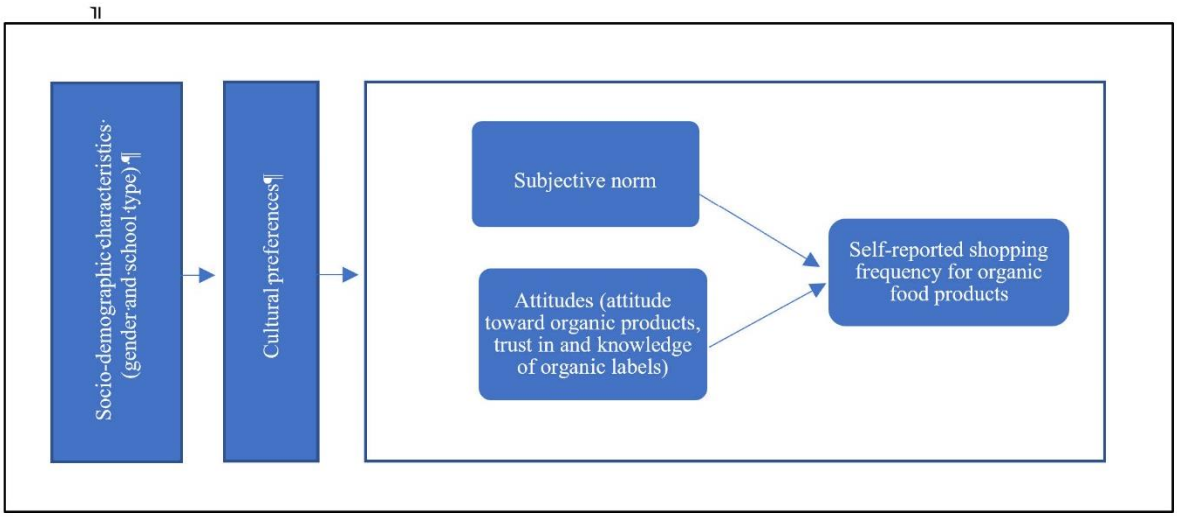

Figure 1. Research model of high school students self-reported shopping frequency for organic food products. (Based on Ajzen and Fishbein (2005); subjective norm and attitudes as determinants according to the Theory of Planned Behavior, complemented by cultural preferences and socio-demographic characteristics according to literature review and research objectives).

Figure 1 summarizes the variables in our research model to explain high school students' self-reported shopping frequency for organic food products. In the operationalization of subjective norm we follow the determinations of the TPB. We use attitudes with the following adjustments: (1) We apply attitude toward the attitudinal object (organic food products) instead of attitude toward the behavior (shopping of organic food products). This is because attitude toward organic food products is the primary interest of our research. (2) In addition to that, we look at trust in and knowledge of organic labels. This, because trust in organic labels could be a major factor of shopping behavior of organic food products and therefore, respective knowledge of organic labels can also be considered as part of the concept of attitudes in our research model. (3) We do not include perceived or actual behavior control as high school students are not (yet) responsible for the household budget and typically do not dispose of an own income. Consequently, perceived price differences between conventional and organic food products do not necessarily affect student's attitude or behavior. (4) We turn directly to behavior (shopping of organic food products) rather than to intended behavior. Finally, (5) with the intention to improve the explanatory value of our research model we include socio-demographic characteristics (gender, school type), and, according to our theoretical foundations, cultural preferences. Indeed, several studies have extended the TPB with one or more components such as lifestyle, trust, knowledge, demographic or other background factors to improve predictability of social behavior (Aertsens et al., 2011; Carfora et al., 2019; De Leeuw et al., 2015; Giampietri et al., 2018; Liobikienė et al., 2016).

3 Research Objectives

The overall aim of our research is to contribute to a better understanding of adolescents' self-reported shopping frequency of organic food products and to provide insights about the impact of subjective norm, attitudes, socio-demographic characteristics, and cultural preferences. Our research model of self-reported shopping frequency of organic food products of rural high school students will be assessed and discussed based on empirical survey research. The following research objectives will allow us to address the overall research aim:

1. to assess and describe the components of our research model: socio-demographic characteristics, attitudes (attitude toward organic food products, trust in and knowledge of organic labels), subjective norm, self-reported shopping frequency of organic food products,
2. to identify cultural preferences of the high school students,
3. to explore the relations between socio-demographic characteristics and cultural preferences with attitudes (attitude toward organic food products, trust in and knowledge of organic labels), subjective norm, and self-reported shopping frequency,
4. to determine the impact of socio-demographic characteristics, cultural preferences, and attitudes (attitude toward organic food products, trust in and knowledge of organic labels) and subjective norm on self-reported shopping frequency for organic food products.

3.1 Questionnaire development, data collection and school types

A first version of a standardized questionnaire to assess high school students' self-reported shopping frequency of organic products was designed in 2003, pilot-tested (n=34) and used in a survey (n=277) in Vienna (Leitner, 2004). The questionnaire was reviewed (attitude questions, subjective norm, and socio-demographic characteristics) and completed with knowledge questions. This version was pilot tested (n=27) (Bacher, 2005; Buchner, 2005) before conducting a further survey in Vienna in 2005 (n=345) (Gotschi et al., 2009; Vogel et al., 2010).

For the survey of this study in 2018, the questionnaire remained largely unchanged from the 2005 survey, with the following modifications: the assessment of attitude toward organic food products was on a five-point scale (previously a seven-point scale), knowledge labels were updated to reflect the logos currently in use, cultural preferences were updated to better reflect rural context as well as changes in communication and mass media (adding the categories "associations", "fire brigade" and "social media").

In June 2018 the survey was administered to assess our research objectives and the components of our research model of self-reported shopping frequency of organic food products of high school students in the Weinviertel, a rural area in Lower Austria. Vocational high schools are a special feature of the Austrian school system in the sense that the attainment of the *Matura* (school leaving examination which is required to access university) is combined with practical vocational training. The Weinviertel, a typical rural region of Lower Austria with the three school towns Gänserndorf, Hollabrunn and Mistelbach with about 11,000 inhabitants each, was chosen as the survey region. The total of 565 interviews was distributed among the schools as follows: 308 students from the high school for entrepreneurship education (HAK) in Gänserndorf (54.4%), 48 from the high school for technical, industrial and handcraft occupations (HTL) in Hollabrunn (8.5%), and 209 from the high school for occupations in service industries, administration, and tourism (HLW) in Mistelbach (37%). To cover different age cohorts, students of the 9th and 12th grades were interviewed in their classrooms during regular teaching hours (65.1 % female, 34.9 % male).

Students have been asked to fill in the questionnaire during supervised school hours. Therefore, the return quote and completeness of questionnaires were very high: 565 out of 565 questionnaires could be used for the analysis. The data of the 565 high school students from rural Lower Austria which resulted from the survey in 2018, forms the basis of this study. We do not claim this sample to be representative for the whole of rural Austria as our sample only stems from the Weinviertel and does not contain data from other school types such as Gymnasiums. Our aim was rather to explore the interrelations between the variables of our research model of high school students' self-reported shopping frequency for organic food products. As far as our research model is concerned, the following parts make up the questionnaire:

1. Socio-demographic characteristics: School type was assessed and noted by the interviewer within the framework of the survey in the classrooms (3 high school types[1]: HLW, HAK, and HTL). Gender was indicated by the high school students (1 = female, 2 = male).

[1] We use the internationally accepted term "high school" for school grades 9-13 (e.g., students are 14-19 years old). However, the Federal Ministry of Austria for Education, Science and Research calls these schools "College for higher vocational education" (Federal Ministry Republic of Austria Education, 2022).

2. Cultural preferences: students ranked the following activities and general perceptions according to the survey question "What is important to you in your life?" (from 5 = very important to 1 = unimportant): sport, health, TV, party/disco/cinema/going out, computer games/videos, theatre, classical music, pop/rock music, magazines/comics, travel, associations, fire brigade, nutrition, car/motorcycle, social media, books, hiking/cycling/being in nature, protection of the environment, income.

3. Subjective norm (SN):

   Students' indication of how important the opinion of the following persons or group was to them: mother, father, siblings, friends, classmates, and teachers (between 5 = very important and 1 = unimportant).

   Students' perception of how these persons or groups evaluated / accepted organic food products (1 = not at all, 5 = very much).

4. Attitudes were measured as follows:

   Attitude toward organic food products: students were asked to assess their overall evaluation toward organic food products on a five-point scale (1=  3=  5= )

   Trust in organic labels: students were asked to what extent they agreed organic labels can be trusted to correctly identify organic food products on a four-point scale (1=trust not at all, 2= rather not, 3= rather and 4=trust completely).

   Knowledge of organic labels: two questions to assess students' correct identification of:

      8 terms, out of which 2 correctly labelled organic food products,
      5 labels out of which 3 legally denominated organic food products.

5. Self-reported shopping frequency of organic food products was assessed on a four-point ordinal scale

      (1 = never, 2 =rarely, 3 = sometimes and 4 = regularly).

While general education (German, English, second foreign language, mathematics, and natural sciences) is covered by each of the three vocational high schools included in our survey, each has a distinct profile. The high school for occupations in service industries, administration, and tourism (HLW) focuses on communications, accounting and business administration, nutrition, food, and beverage preparation. The high school for entrepreneurship education (HAK) focuses on commerce, accounting, economics, and financial education. The high school for technical, industrial and handcraft occupations (HTL) focusses on one or several of 30 specialty fields such as art and design, electronics, mechatronics, informatics/ICT, construction etc. Work placements to gain practical experiences are mandatory in each of these high schools (8-12 weeks over the course of 5 years). Upon completion of the school many students enter the workforce as the vocational components of the schools enhance employability and entrepreneurship. However, students are also qualified to enter university (Bundesministerium Bildung, 2022).

3.2 Data processing and statistical evaluation

For statistical evaluation we used the Statistical Package for Social Sciences (IBM, 2021) for descriptive statistics, factor analysis, cross-tabulations, independent t-tests, discriminant and multivariate analysis. We set $p < 0.05$ as the minimum level of significance.

The 20 activities and general perceptions which the students had ranked for importance in their life were bundled to cultural preferences by use of factor analysis using Principal Components method and Varimax rotation with Kaiser Normalization and extraction of factors with *Eigenvalue* > 1.2. Only factor loads > 0.450 were considered for further analysis.

An ordinal measure for Subjective Norm (SN) was computed as a product of students' indication of how important the opinion of mother, father, siblings, friends, classmates, and teachers was to them with students' perception of how these persons or groups evaluated organic food products. These SN variables have been recoded into 5 discreet categories. A variable of subjective norm for the whole social environment was calculated for every high school student as the sum of SN variables of all persons or groups.

A variable for knowledge was computed (added up) from two ordinal variables based on the students' correct identification of: 8 terms, out of which 2 correctly labelled organic food products and 5 labels, out of which 3 legally denominated organic food products.

Relations between model components were explored in bivariate analyses before employing discriminant and multivariate analysis to determine the impact of socio-demographic characteristics, cultural patterns, attitudes (attitude toward organic food products, trust in and knowledge of organic labels) and subjective norm on self-reported shopping

frequency buy i) never, ii) rarely, iii) sometimes and iv) regularly were grouped into two categories buy i) never or rarely and ii) sometimes and regularly.

The validity of findings was checked with Calculation Method 2 (CM2) where self-reported shopping frequency was grouped into buy i) never, rarely, sometimes and ii) regularly. In Calculation Method 3 (CM3) we compared buy i) never, with ii) sometimes and regularly. Responses "buy rarely" have been excluded for contrasting purposes.

4 Results

4.1 Descriptive results

Out of the 565 respondents 65.1 % were female and 34.9 % male. Of the sample, 37 % were HLW, 54.5 % HAK and 8.5% HTL. The high number of female respondents, particularly for HLW and HAK, is congruent with data from Statistik Austria for 2019/20. 84.2 % of students attending HLW and 57.4 % of students attending HAK are female. HTL students are predominantly male, with only 27 % of female students (Statistik-Austria, 2022).

With respect to attitudes toward organic food products, 31.1 % of high school students rated organic food products as very good, 50 % as good, 15.5 % were undecided and 3.4 % gave a low overall rating (sum of the lower two ranks).

As far as knowledge of organic labels is concerned, 65.3 % of respondents recognized 9 out of 13 labels correctly, and 28.1 % recognized 11 out of 13 labels correctly.

Self-reported shopping frequency for organic food products revealed that 10.9 % of high school students regularly buy organic food products, 37.7 % buy them occasionally, 23.5 % rarely and 9.3 % never. 18.5 % responded "not applicable" to the question. These are obviously those high school students who do not yet shop independently[2].

4.2 Extraction of cultural preferences

By use of factor analysis students' assessment of the importance of twenty activities and general perceptions in their life was reduced to five different cultural preferences of "health", "classic", "party", "community" and "digital" (see Table 1). These five cultural preferences explain 51.4 % of the variance in students' indications of the importance of activities and general perceptions. Table 1 shows the type of cultural preference together with the activities and perceptions belonging to the respective cultural preference. The items television (TV), Travel, car/motor bike, hiking/cycling/being in nature, and income did not load highly on any of the five cultural patterns (factor loading <0.450), nor did they form a separate cultural preference.

Table 1.
Factor analysis to identify cultural preferences.

Type / Label	*% variance*	*activities/perceptions*	*Factor Load*
Health	12.56	Health	0.788
		Nutrition	0.658
		Protection of the Environment	0.652
Classic	12.54	Theatre	0.732
		Classic music	0.610
		Magazines / comics	0.483
		Books	0.721
Party	10.53	Party, Disco, Cinema, going out	0.673
		Rock/pop music	0.496
		Social Media	0.629
		Friends	0.505
Community	8.16	Sport	0.583
		Associations	0.864
		Fire brigade	0.476
Digital	7.63	Computers games, Videos	0.761
		Magazines, Comics	0.555

Factor Analysis (Principal Component, Varimax, extraction of factors with Eigenvalue >1.2), only activities/perceptions with factors loading >0.450 are displayed. Issues with factor loading <0.450 included TV, travel, car/motor bike, hiking/cycling/being in nature, and income.

[2] Respondents who did not yet shop independently have been excluded from analysis of behaviour (see Table 2-4 and 6).

4.3 Relations of socio-demographic characteristics and cultural preferences with attitudes, subjective norm, and self-reported shopping frequency

T-test[3] was used to explore the relations between socio-demographic characteristics (gender and school type) with subjective norm, attitudes, and self-reported shopping frequency for organic food products (see Table 2).

Compared to girls, boys were more likely to develop a positive attitude toward organic food products (4.049***) and, as SN is concerned, were significantly more influenced by their friends (3.337***), teachers (2.268*) and the whole social environment (2.356*). They were also more likely to buy organic food products (2.459*).

As far as school types were concerned students at HAK had significantly higher knowledge (2.479*, compared to HTL -2.679**), a more positive attitude toward organic food products (4.534***, compared to HLW -3.289** and HTL -2.317*), a higher level of trust in organic labels (2.454***, compared to HLW -2.283*) and a higher level of self-reported shopping frequency for organic food products (2.782**, compared to -2.105* HLW). Furthermore, HAK students showed a higher level of subjective norm for mother (HAK 3.078**, HTL -2.405*), siblings (HAK 2.376*), friends (HAK 4.99***, HLW -3.317***, -3.096**), and classmates (HAK 3.328***, HLW -2.029*, HTL -2.461*). In consequence, the statistical analysis showed, that HAK high school students showed a positive and significantly higher level of subjective norm of the whole social environment (HAK 4.158***, HLW -2.916**, HTL -2.5*).

Table 2.

Relation between socio-demographic characteristics (gender and school type) with subjective norm (SN), attitudes and self-reported shopping frequency for organic food products

Variable	*Gender[b)]*	*HLW[c)]*	*HAK[c)]*	*HTL[c)]*
SN mother			3.078**	-2.405*
SN father				
SN siblings			2.376*	
SN friends	3.337***	-3.317***	4.99***	-3.096**
SN classmates		-2.029*	3.328***	-2.461*
SN teachers	2.268*			
SN social environment	2.356*	-2.916**	4.158***	-2.5*
Attitude toward organic food products	4.049***	-3.289**	4.534***	-2.317*
Trust in organic labels		-2.283*	2.454*	
Knowledge of organic labels			2.479*	-2.672**
Self-reported shopping frequency for organic food products[a)]	2.459*	-2.105*	2.782**	

[a)] respondents who do not report shopping frequency for organic food products (responses "not applicable") have been excluded; [b)] female=1, male=2, [c)] non-attendance of high school type=0, attendance of high school type=1; t-test: *** < 0.001 significance, ** < 0.01 significance, * 0.05 < significance, t-value und sig (2-tailed)

The analysis of relations of cultural preferences with subjective norm, attitudes and self-reported shopping frequency for organic food products (Table 3) revealed that "party" was not related to any of the other variables in our model (subjective norm, attitudes, and self-reported shopping frequency for organic food products). None of the cultural patterns were related to trust in organic labels. The statistical analysis (in parentheses: Gamma level of significance) shows that respondents with the cultural pattern "health" (e.g. students who reported that health, nutrition and protection of the environment are most important in their lives), "classic" (e.g. students who reported that theatre, classic music, magazines/comics and books are most important in their lives), and "community" (e.g. students who reported that sport, associations and fire brigade are most important in their lives) had a significantly positive attitude toward organic food products (7.147***, 3.932*** and 3.404*** respectively). High school students with these cultural patterns were also significantly positive embedded in the subjective norm of their whole social environment (4.721***, 6.882*** and 5.338*** respectively). Subjective norm of individual attachment persons was positive, though with some variation: for SN mother with Health (3.811***), and with Community (4.364***); for SN father with Health (3.956**), Classic (3.476**) and Community (3.689***); for SN siblings with Health (4.462***), Classic (3.228**) and Community (2.846***); for SN friends with Health 3.592*** and Classic (5.679***); for class mates with Classic (4.705***) and Community (2.69**); and, finally for SN teachers with Health (3.641***), Classic (7.111***) and Community (2.896**). Students with the cultural preference "Classic" were significantly positively linked to higher levels of knowledge of

[3] Values in parentheses with levels of significance *** p < 0.001, ** p < 0.01, * p < 0.05

organic labels (3.1**), while the link of knowledge of organic labels was significantly negative to the cultural preference "Digital" (-2.114*). As far as self-reported shopping frequency for organic food products is concerned, "Health", "Classic" and "Community" were significantly related to higher levels of self-reported shopping frequency (4.669***, 4.262***, 2.128*).

Table 3.
Relation between Cultural preferences with subjective norm (SN), attitudes and self-reported shopping frequency for organic food products

Variables	*Health*	*Classic*	*Party*	*Community*	*Digital*
SN mother	3.811***			4.364***	
SN father	2.956**	3.476***		3.689***	
SN siblings	4.462***	3.228**		2.846**	
SN friends	3.592***	5.679***			
SN classmates		4.705***		2.69**	
SN teachers	3.641***	7.111***		2.896**	
SN social environment	4.721***	6.882***		5.338***	
Attitude toward organic food products	7.147***	3.932***		3.404***	
Trust in organic labels					
Knowledge of organic labels		3.1**			-2.114*
Self-reported shopping frequency for organic food products [a)]	4.669***	4.262***		2.128*	

[a)] respondents who do not report shopping frequency for organic food products (responses "not applicable") have been excluded;
Cross tabulations (Gamma): * < 0.001 significance, ** < 0.01 significance, * 0.05 < significance**

We also have analyzed the relations between attitudes (attitude toward organic food products, trust in and knowledge of organic labels) and self-reported shopping frequency for organic food products with subjective norm of the whole social environment. High positive correlations were found between subjective norm of the whole social environment and attitude toward organic food products (11.508***). Positively related with SN whole social environment are also trust in (4.151***) and knowledge of organic labels (2.904*) as well as self-reported shopping frequency for organic food products (6.275***). Subjective norm mother and father had an especially high significant relation to attitude toward organic food products (12.275*** and 10.121***) and were also significantly related to self-reported shopping frequency of organic food products (6.217*** and 4.239***). SN friends is significantly related with attitude toward organic food products (6.9991***), to knowledge of organic labels (4.285***) and self-reported shopping frequency of organic products (4.735***).

A statistical analysis (in parentheses: Gamma, level of significance) of the relation of socio-demographic characteristics (gender and school type) with cultural preferences (Table 5) revealed that girls were more likely to hold the cultural preferences "Health", "Classic" and "Party" (-3.202***, -6.543***, -4.745***) while boys were more likely to form the preferences "community" and "digital" (3.747*** and 14.347***). HLW was more likely to attract students with activities/perceptions represented by the cultural preferences "Classic" (3.998***) and "Party" (2.093*) and less likely with "Digital" (-5.199***). HAK was more likely to attract students with the cultural preference pattern "Digital" (6.223***) and less likely to attract students with the cultural preferences "Health" (-2.203*) or "Classic" (-3.968***). HTL did not significantly attract students of any specific cultural pattern.

Table 4.
Attitudes (attitude toward organic food products, trust in and knowledge of organic labels) and self-reported shopping frequency for organic food products with subjective norm (SN)

Variable[l]	*Attitude toward organic food products*	*Trust in organic labels*	*Knowledge of organic labels*	*Self-reported shopping frequency for organic food products*[a)]
SN mother	12.275***	5.855***	2.221*	6.212***
SN father	10.121***	3.35***		4.239***
SN siblings	7.414***			4.577***
SN friends	6.991***		4.285***	4.735***
SN classmates	3.532***		2.499*	3.427***
SN teachers	3.249**			
SN social environment	11.508***	4.151***	2.904*	6.275***
Attitude toward organic food products	n/a	5.766***	2.787**	10.791***
Trust in organic labels	5.766***	n/a		
Knowledge of organic labels	2.787*		n/a	4.219***
Self-reported shopping frequency for organic food products [a)]	10.791***		4.219***	n/a

[a)] Respondents who do not report shopping for organic food products (responses "not applicable") have been excluded;
Cross tabulations (Gamma): *** < 0.001 significance, ** < 0.01 significance, * 0.05 < significance

Table 5.
Relation of Socio-demographic characteristics (gender, school type) with cultural preferences

Variable	*Gender* [a)]	*HLW* [b)]	*HAK* [b)]	*HTL* [b)]
Health	-3.202***		-2.203*	
Classic	-6.543***	3.998***	-3.968***	
Party	-4.745***	2.093*		
Community	3.747***			
Digital	14.347***	-5.199***	6.223***	

[a)] female=1, male=2, [b)] attendance of high school type=1, non-attendance of high school type=0;
Cross-tabulations (Gamma): ***< 0.001 significance, ** < 0.01 significance, * 0.05 < significance

4.4 Determining the impact of socio-demographic characteristics, cultural preferences, attitudes (attitude toward organic products, trust in and knowledge of organic labels) and subjective norm on self-reported shopping frequency of organic products using discriminant and multivariate analysis

Discriminant and multivariate analysis were used to test the impact of socio-demographic characteristics (gender, school type), cultural preferences, attitudes (attitude toward organic food products, trust in and knowledge of organic food products) as well as subjective norm to explain the self-reported shopping frequency for organic food products among rural high school students in the Weinviertel (see Table 6).

Three calculation methods (CM) were applied: CM1 grouped the answer categories to "never" and "rarely" of buying organic food products into one group and "sometimes" with "regularly" into another group and compared these two groups, CM 2 grouped "never", "rarely" and "sometimes" into one group to compare this group with "regularly", and CM3 compared "never" with a group formed by "sometimes" and "regularly", leaving out "rarely" for contrasting purposes.

Correctly predicted group membership was high with 70.2 % for CM1, 73.1 % for CM2 and 78.4% for CM3 and significant results were yielded (CM1: χ^2 94.713***, CM2: χ^2 51.643***, CM3: χ^2 79.657***). Good predictors of self-reported shopping frequency of organic food products are i) attitudes, ii) the subjective norm mother, father, and siblings, and iii) the subjective norm of the whole social environments. Less consistent predictors of frequency of self-reported shopping frequency across the three CMs are cultural preferences (significant are: "health", "classic", "community" and "digital"), knowledge of organic labels, school type (HAK, HLW) and gender.

Table 6.
Predicting self-reported shopping frequency for organic food products

	Discriminant Function Coefficient			*F (multivariate, corrected Model)*		
Variable						
	CM1 [a)] (N=366)	CM2 [b)] (N=366)	CM3 [c)] (N=366)	CM1 (N=366)	CM2 (N=366)	CM3 (N=366)
Gender	-0.133	0144	-0.177			8.712**
HLW	-0.242	0.363	-0.023			4.317*
HAK	-0.370	0.501	-0.129	13.778***		7.926**
HTL						
Health	0.070	0.224	0.038		6.919**	6.65*
Classic	0.287	0.155	0.222	18.208***		13.671***
Party	-0.125	-0.056	-0.104			
Community	0.128	0.186	-0.031		4.495*	
Digital						6.269*
SN mother	0.270	0.297	0.124	29.459***	17.676***	14.643***
SN father	0.057	0.104	0.145	9.357**	7.814**	12.718***
SN siblings	0.128	0.117	0.195	11.103***	7.366**	12.105***
SN friends	-0.046	0.111	0.019	10.537**		10.882**
SN classmates	0.096	0.117	0.057			5.148*
SN teachers	-0.134	-0.249	0.066			
SN social environment				25.959***	15.841***	27.541***
Attitude toward organic food products	0.579	0.579	0.710	26.931***	29.242***	66.275***
Trust in organic labels	-0.032	-0.187	-0.109			
Knowledge of organic labels	0.255	0.242	0.128	39.57***	6.265*	
Overall Chi	94.713***	51.643***	79.657***			
			Predicted Group classification			
Actual Group Classification						
CM 1) (N=471)			Buy never and rarely	Buy sometimes and regularly		Total
70.2 % of original grouped cases classified correctly		Buy never and rarely	104 (69.8%)	45 (30.2%)		149 (100%)
		Buy sometimes and regularly	69 (29.5%)	165 (70.5%)		234 (100%)
		Ungrouped	81 (92%)	7 (8 %)		88 (100%)
CM 2) (N=471)			Buy never, rarely and sometimes	Buy regularly		Total
73.1% of original grouped cases classified correctly		Buy never, rarely and sometimes	238 (72.1%)	92 (27.9%)		330 (100%)
		Buy regularly	11 (20.8%)	42 (79.2%)		53 (100%)
		Ungrouped	84 (95.5%)	4 (4.5%)		88 (100%)
CM 3) (N=471)			Buy never	Buy sometimes and regularly		Total
78.4% of original grouped cases classified correctly		Buy never	36 (81.8%)	8 (18.2%)		44 (100%)
		Buy sometimes and regularly	52 (22.2%)	182 (77.8%)		193 (100%)
		Ungrouped	122 (63.2%)	71 (36.8%)		193 (100%)

Notes: Calculation methods (CM) 1, 2 and 3 differ in the coding of self-reported shopping frequency for organic food products.
[a)] CM1: 1= never+rarely, 2=sometimes+ regularly (N=366), [b)] CM2: 1=never, rarely, sometimes, 2= regularly (N=366), [c)] CM3: 1=never, 2 = sometimes + regularly (N=366), responses "rarely" have been excluded for contrasting purposes; as before, respondents who do not yet shop for organic food products have not been included in this analysis;
Predictive discriminant analysis**:** *** < 0.001 significance, ** < 0.01 significance, * 0.05 < significance

5 Discussion and Conclusion

Based on survey data from 2018 of 565 high school students from rural Austria we can confirm our research model. High school students' self-reported shopping frequency is influenced by socio-demographic characteristics (gender, school type), cultural preferences, attitudes (attitude toward organic food products and knowledge of organic labels)

and subjective norm. However, for the collected data from rural high school students in Austria, trust in organic labels is not influencing shopping frequency for organic food products. Therefore, this aspect of attitudes can be excluded from our research model. The confirmation of knowledge of organic labels as a factor of self-reported shopping frequency for organic products differs from our earlier findings from 2005 for high school students in Vienna, where we could not find significant correlations between knowledge of organic labels and self-reported shopping frequency of organic products (Gotschi et al., 2009).

The results allow insights into the relative importance of primary and secondary socialization on the formation of attitudes toward organic food products (trust in and knowledge of organic labels) and self-reported shopping frequency for organic food products. Our data shows that the mother is the most important social influence shaping students' trust in and knowledge of organic labels. The mothers influence on attitude toward organic food products and self-reported shopping frequency is also very strong.

Secondary socialization (subjective norm of friends, classmates, and teachers) also influences attitudes toward organic food products and, with exceptions of teachers, knowledge of organic labels and self-reported shopping frequency for organic food products. Friends and classmates, it seems, reinforce the attitudes and behaviors learnt at home. Overall, our findings confirm the positive correlation between social norm and organic food consumption (Giampietri et al., 2020). Comparing the influence of primary and secondary socialization (normative influence of parents and siblings versus schoolteachers, friends and classmates), the norms and values learned at home seem to be more influential in developing attitudes. This contrasts findings on the influence of norms and peer pressure on food intake of adolescents. Studies conducted by Stok et al. (2015), Lally et al. (2011) or Wouters et al. (2010) have emphasized the importance of peers influencing social behavior, in particular eating habits. Possibly, the difference lies in the character of the analyzed behavior (shopping behavior versus eating habits), in the rural setting of the survey of this study or in the character of the types of schools studied, which all correspond to more technical/applied directions.

Interesting is the relatively weak role of teachers as compared to families and peers in influencing attitudes, knowledge and shaping behavior of high school students. Obviously, the strong social bonds within the family and the need to belong by forming friendships are more important to adolescents in the formation of attitudes and decisions around shopping behavior compared to the normative influence a teacher has in the classroom. These findings on limitations of teachers influence on behavioral outcomes could have far reaching implications on the design of educational goals and policies.

There is only a slight impact of school type (positive in the case of HAK on trust in and knowledge of organic labels, negative in the case of HLW on trust in organic labels and HTL on knowledge of organic labels). We have found that students attending HAK are more likely to shop for organic food products. Students in HAK study marketing, business, and the framework of economic markets while students in HLW focus more on food preparation and gain insights into the hospitality sector. HAK students get familiar with markets and market regulation including labelling strategies. This could also be a reason that HAK students are more and HLW students less likely to trust organic labels and the organic food sector. Keeping in mind the important finding of the relative importance of primary socialization compared to secondary socialization, we could also argue that school types with specific focus on specialties attract students already holding certain attitudes rather than to form these at schools. Further research into the role of schools and specific school types in attracting and / or forming certain types of students' attitudes and related behavior would be interesting.

Our study has further affirmed gender differences: girls are more likely to hold a positive attitude toward organic food products, and are more likely to shop for organic food products then boys. This finding corresponds with the study on youth and organics conducted by Steinwidder et al. (2018). There is no impact of gender on trust in and knowledge of organic labels.

We found that better knowledge of organic labels is related to a positive attitude toward organic food products and a higher level of self-reported shopping frequency. The latter is particularly interesting, as it contradicts findings in our earlier study of high school students in Vienna (Gotschi et al., 2009), however is congruent with findings of Aertsens et al. (2011).

We have identified five distinct patterns of students' cultural preferences of which three ("health", "classic" and "community") are connected to a positive attitude toward organic food products, are well embedded in subjective norms and are positively correlated with self-reported shopping frequency for organic food products. In addition to that the cultural preference "classic" is related to higher levels of knowledge of organic labels. The cultural patterns of "party" had no significant relation to any of the variables of subjective norm, attitudes and self-reported shopping frequency for organic food products. The only significant relation of the cultural pattern "digital" is that it relates to lower levels of knowledge of organic labels. A better understanding of adolescents cultural preferences and how these shape attitudes towards organic food products may help improve our understanding of consumption and ultimately help predict how the market will evolve.

Disclosure statement

The authors declare no competing interests.

Ethics declarations

The study followed ethical collection of data as approved by the University of Natural Resources and Applied Life Sciences, Vienna.

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Note

[a]For European standards for labeling, production methods, and inspections of organic production see E.C. Regulation 2092/91.

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