frontiers | Frontiers in Communication

TYPE Original Research
PUBLISHED 01 August 2024
DOI 10.3389/fcomm.2024.1414042

OPEN ACCESS

EDITED BY
Ataharul Chowdhury,
University of Guelph, Canada

REVIEWED BY
Caitlin Kirby,
Michigan State University, United States
Holli Leggette,
Texas A&M University, United States

*CORRESPONDENCE
Julie Campbell
julie.campbell@uga.edu

RECEIVED 08 April 2024
ACCEPTED 22 July 2024
PUBLISHED 01 August 2024

CITATION
Nayak S, Campbell J and Duffey KC (2024) Utilizing Q methodology to explore university students' perceptions of the organic food industry: the integral role of social media. *Front. Commun.* 9:1414042. doi: 10.3389/fcomm.2024.1414042

Utilizing Q methodology to explore university students' perceptions of the organic food industry: the integral role of social media

Swayangsiddha Nayak, Julie Campbell* and Kate Cassity Duffey

Department of Horticulture, University of Georgia, Athens, GA, United States

The ascendancy of social media as a predominant source of information has underscored the imperative to grasp its impact on individuals' perceptions and behaviors across diverse industries. In the realm of organic farming, which often sparks conflicting perspectives among stakeholders, the inundation of user-generated content presents a formidable challenge in discerning reliable sources from dubious ones. This phenomenon risks perpetuating misinformation, particularly among younger consumers, with uncertain implications for Agricultural Education and Communication. To address this void in understanding how social media influences perceptions of organic farming, a study was undertaken at the University of Georgia, utilizing Q methodology to delve into the perspectives of undergraduate and graduate students regarding organic food and farming practices. Complementing this approach, an offline survey questionnaire assessed their purchasing habits and media consumption patterns. Through the sorting of 41 statements encompassing themes such as health, socioeconomics, environment, ideological beliefs, and ethics, the study identified four distinct consumer typologies: "Dilettante Consumers," "Decisive Consumers," "Need-based Consumers," and "Wandering Consumers." Social media platforms such as Instagram and YouTube were identified as the primary information sources for young consumers seeking information about the organic farming industry. Source attractiveness and perceived trustworthiness were identified as major attributes contributing to the credibility of social media as an information source among these consumers. However, their reliance on source expertise remained debatable. Notably, the research also unveiled that students' experiential learning facilitated a more nuanced understanding of various facets of the organic food industry. These findings emphasize the necessity for stakeholders to adapt to the digital age and remodel their communication strategies to better comprehend consumer perspectives and address prevailing knowledge gaps, particularly among the younger demographic.

KEYWORDS

Q methodology, science communication, social media, source credibility, organic farming, typologies, Millennials, Gen Z

1 Introduction

According to a report by Grand View Research, the organic food sales in the United States amounted to approximately 63.8 billion U.S. dollars in 2023. Additionally, the organic food and beverage market is expected to expand at a compound annual growth rate (CAGR) of 13.5% from 2024 to 2030 (Grand View Research, 2022). However, in the wake of the growing demand for organic produce, some skeptics, including researchers, suggest that the contemporary practice of organic farming is not coherent with its underlying ideological principles that were based on "humus" farming (Kuepper, 2010). They argue that some socio-environmental aspects of organic farming are getting compromised directly or indirectly for yield efficiency (Magkos et al., 2006; Williamson, 2007; Best, 2008; Adams and Salois, 2010; Leifeld and Fuhrer, 2010; Forman et al., 2012). Conversely, other studies argue that organic farming is the optimal alternative to conventional farming practices, citing its health, environmental and ethical considerations (Cicia et al., 2009; Cerjak et al., 2010; Scialabba and Müller-Lindenlauf, 2010; Tandon et al., 2020). Some researchers also state that factors such as utilitarian and hedonic values, including perceived superiority of taste, quality and prestige associated with eating organic, also play a major role in the growth of the organic farming industry (Nasir and Karakaya, 2014; Lee and Yun, 2015; Curvelo et al., 2019; Ghali, 2020). This observed discord within the scientific community often leads to public skepticism (Hunt and Wald, 2020). Furthermore, the issues related to the enforcement of standard regulations on organic produce by the National Organic Program (NOP) in the U.S. and the organic certification process conducted by third-party profit-driven companies make it increasingly challenging to distinguish genuine organic from "pseudo-organic" labels (González and Parga-Dans, 2020; Kun and Kiss, 2021; Lanero et al., 2021).

Hence, there is a lack of unified stance on the benefits of commercial organic farming (Reganold and Wachter, 2016), reflecting the nuanced and multifaceted nature of the topic. This situation is often exploited by marketing companies in form of (1) selective presentation of information that involves highlighting studies that support the perceived benefits of organic products while downplaying or ignoring studies that show less favorable results, (2) emotional appeals and greenwashing that connect with consumers' values and concerns about health and sustainability, (3) premium pricing justification that imply higher cost as a worthwhile investment in health and environmental sustainability, even if the actual benefits are not definitively proven, and (4) creation of pseudo-organic labels that mislead consumers into thinking they are purchasing genuinely organic products (Yiridoe et al., 2005; Hughner et al., 2007; Thøgersen, 2010; Aertsens et al., 2011; Smith-Spangler et al., 2012).

While the average consumer may not necessarily base their food purchasing decisions on the latest scientific debates pertaining to the organic food industry and in ways may lack a comprehensive knowledge about organic farming (Magkos et al., 2006), however, they certainly rely on such advertisements and marketing strategies (Tariq et al., 2019) that create a skewed perception of the industry. In the era of digital marketing, social media has become a key channel for the dissemination of misinformation and disinformation (Meel and Vishwakarma, 2020). Marketing strategies often exploit this to influence consumer perceptions, contributing to the dissonance between what consumers perceive and their actual purchasing behaviors (Magkos et al., 2006; Hidalgo-Baz et al., 2017; Edenbrandt et al., 2021; Koswatta et al., 2023).

Today, the consumer market is driven by Millennials and Gen Z who are either a part of a student or a workforce community. They not only dominate the consumer market (Su et al., 2019), but also the social media landscape (Fleming-Milici and Harris, 2020). Young consumers gravitate toward social media as a significant source of information for making their informed purchase decisions (Stephen, 2016), including food purchases (Aubrun et al., 2005; Kuttschreuter et al., 2014). However, the credibility of information disseminated through social media platforms often comes into question due to its problematic journalism, especially when it is sourced from citizen journalists (Wall, 2015).

Additionally, social media algorithms often prioritize content that aligns with a user's existing beliefs and preferences, creating an echo chamber (Cinelli et al., 2021) where people are exposed primarily to information that reinforces their perceptions. This can contribute to polarization and hinder constructive dialog between groups of individuals with varied opinions (Ireton and Posetti, 2018; Martens et al., 2018; Meel and Vishwakarma, 2020; Majerczak and Strzelecki, 2022). Despite these foreseeable challenges, Millennials and Gen Z increasingly rely on social media for news consumption. According to a 2022 survey, about 50% of Gen Z and 44% of Millennials in the United States have reported using one or more social media platforms as their preferred source of news on daily basis (Statista, 2024). Thus, social media plays a pivotal role in influencing the perceptions and buying behavior of these generational cohorts (Pate and Adams, 2013; Stephen, 2016; Qutteina et al., 2019; Sayyed and Gupta, 2020). Moreover, depending on the credibility of the information sources they choose (Giffin, 1967), the young consumer becomes both a victim and agent for the spread of misinformation and disinformation.

Brands today use influencer marketing on social media to gauge young consumers' attention. Using the influencer marketing strategy, social media influencers as "micro-endorsers" (as compared to "bigger" celebrity endorsers) embody the same role that message sources play in the persuasion process (Hall, 2015). Thus, influencing perceptions and actual buying behavior of young consumers via blogs, posts, tweets, reels, and other forms of interactive social media engagement channels (Taprial and Kanwar, 2012; Sayyed and Gupta, 2020; Serbanescu, 2022). This phenomenon emphasizes the need to comprehend not just the perceptions of Millennials and Gen Z regarding the organic food industry, but also the specific media sources they rely on to gather information for making informed food purchasing decisions.

Numerous studies have explored consumers' perceptions toward organic farming and how it may influence their buying behavior (Dimitri and Dettmann, 2012; Grzelak and Maciejczak, 2013; Rodríguez-Bermúdez et al., 2020; Boobalan et al., 2022). However, few studies have explored student perceptions of the organic farming industry (Uçar and Özçelik, 2012; Osei et al., 2013). Moreover, the sources of information used by these young consumers remain underexplored.

Therefore, this study focusses on the student population (comprising of Millennials and Gen Z) and aims to contribute to the existing literature by (a) developing a typology of student consumers based on their perceptions about the organic farming industry, and (b) examining whether the choice of media as an information source varies across the different typologies. While Q methodology

(Stephenson, 1993) was employed to uncover diverse perspectives within the target population and create a typology of student consumers, an offline semi-structured questionnaire was administered to address the latter half of the study. Additionally, we drew upon the Theory of Source Credibility (Hovland and Weiss, 1951) (c) to explore the factors that lend credibility to the various media platforms used by student consumers to make informed buying decisions about organic produce.

Studies have identified that the credibility of a source is governed by three major components namely attractiveness, trustworthiness, and expertise that influence how a message is received and processed by the audience (McCroskey, 1966; Giffin, 1967; Whitehead, 1968; McGuire, 1985). While source attractiveness includes factors that make the source appealing and engaging, such as ease of access, user-friendly interfaces, and visually appealing content, source trustworthiness, on the other hand, relates to the perceived reliability and credibility of the source (Wathen and Burkell, 2002). Source expertise concerns the source's competence or qualification on a particular subject (Flanagin and Metzger, 2017; Lou and Yuan, 2019). Thus, the theory of source credibility leverages insights into how to effectively communicate messages and influence perceptions and behaviors and, is widely used in fields of marketing, public relations, and persuasion (Pornpitakpan, 2004; Geary, 2005). According to a study on influencer marketing, perceived trustworthiness and attractiveness affect consumers' trust in an influencer's sponsored content. However, it was found that influencer expertise does not influence followers' trust in branded content as influencers by default acquire the status of expertise among their followers (Lou and Yuan, 2019). Consequently, the risk of spreading of misinformation and disinformation is further heightened.

Our study focuses on university students as research participants for several reasons. Firstly, food and nutrition literacy among college students is a prevalent issue (Glik and Martinez, 2017; Payne-Sturges et al., 2018; Raskind et al., 2019). This issue is often exacerbated by a lack of health-promoting media literacy (Bergsma and Carney, 2008; Colatruglio and Slater, 2016). Secondly, younger generations exhibit greater concern for environmental factors (Poortinga et al., 2019; Walker and Matsa, 2021; Belotti et al., 2022), presenting an opportunity to evaluate their engagement with conversations around food and agriculture (Eugenio-Gozalbo et al., 2021). Lastly, college students, comprising Millennials and Gen Z as undergraduates and graduates, wield considerable influence in shaping the future of consumerism, particularly in the realms of digital engagement, authenticity, and sustainability (Sayyed and Gupta, 2020; Serbanescu, 2022).

2 Materials and methods

2.1 Overview of the methodology

Q methodology, introduced by William Stephenson, offers a systematic approach to studying subjectivity, popular among researchers interested in qualitative aspects of human behavior (Stephenson, 1993). It spans across disciplines like sociology (Atkins, 2019), education (Yang and Montgomery, 2013; Barnes et al., 2015; Lundberg et al., 2020), political science (Duenckmann, 2010), psychology (Størksen et al., 2012), veterinary science (de Graaf, 2007), environmental research, and agriculture (Bumbudsanpharoke et al., 2009; Pereira et al., 2016; Iofrida et al., 2018; Lehrer and Sneegas, 2018; Derksen and Mithöfer, 2021; Maurer et al., 2021).

Unlike traditional "R" methodology, which seeks correlations between variables across a sample, Q methodology identifies correlations between subjects across variables, focusing on individual uniqueness rather than population commonalities. This method treats individuals as variables and statements or items as the sample, aiming to explore unique perspectives within a group (Brown et al., 2008). It bridges qualitative and quantitative analysis by correlating individual participants and grouping them into factors (Davis and Michelle, 2011). Each participant's engagement with stimuli generates meaning, providing insights into diverse perspectives within the group, capturing complexity, and preserving individual self-reference without external influence (Stephenson, 1936; Stephenson, 1993). Factors obtained capture perspectives common to many participants but not necessarily all, ensuring a broad representation of perspectives, and thus offering a deeper understanding of human behavior (Watts and Stenner, 2012). This method enhances traditional surveys by providing insights into less significant variables relevant to individuals within a group.

The stepwise process includes concourse development, Q sample set selection, Q sort performance by participants, quantitative Q factor analysis, and factor interpretation. Participants sort statements into rank orders, revealing personal choices and beliefs, and analyzed quantitatively to group participants into factors based on correlated opinions. Interpretation of composite Q sorts or factor arrays allows researchers to assign unique labels to each factor, representing overall perceptions, facilitating a robust framework for studying subjectivity, and offering insights into diverse perspectives within the factors across various disciplines.

2.2 Instrument development and data collection

Before commencing the Q-methodological study, it was imperative to develop a comprehensive list of statements or items, termed the concourse, representing all facets of the subject under investigation (Stenner et al., 2008). This concourse was meticulously curated using statements derived from various sources, including a review of literature on consumer behavior and marketing, qualitative responses derived from the analysis of the survey data, including verbatim statements from participants (Webler et al., 2009), and excerpts from social media platforms such as YouTube, Facebook, and relevant blog posts. Themes generated through a grounded theory approach guided the selection of statements, covering aspects such as the environment, socioeconomics, health, ideological beliefs, and ethics. An almost equivalent number of statements were chosen for each theme to ensure a broad representation of ideas and perspectives. The concourse was iteratively refined until saturation was achieved (Watts and Stenner, 2012).

Following the development of the concourse, a Q sample set was assembled to represent a balanced and holistic picture of opinions within the population. Careful consideration was given to eliminate redundant statements and retain only those representing unique ideas. A total of 41 statements were chosen for the Q sample set from the original list of 80 statements in the concourse. Each statement in the Q sample set was carefully

phrased to minimize repetition, ambiguity, and esoteric terminology, ensuring clarity and coherence (Watts and Stenner, 2012).

The data for the study was collected over the Fall Semester of 2022. In this study, a purposive, non-random sampling approach was employed to select 18 participants from Athens, Georgia. According to Watts and Stenner (2012), in principle, when determining the number of participants for the study, it is advisable to select approximately half the number of statements from the Q set. This approach facilitates more effective factorization of participant groups. The chosen group consisted of both undergraduate and graduate students enrolled at the University of Georgia. To ensure diversity, the researchers consulted with colleagues, advisors, and potential participants to achieve a comprehensive representation across various demographic factors. This inclusivity encompassed age, sex, ethnicity, nationality, educational level (both undergraduate and graduate), and field of study.

For this study, Millennials were defined as individuals born between 1981 and 1996, while Generation Z (Gen Z) included those born between 1997 and 2012, based on criteria established by the Pew Research Center. This delineation allowed for a clear understanding of generational cohorts within the participant sample and facilitated targeted analysis of perspectives on organic farming across different age groups.

All participants ranged in age group from 19 to 29 years except a 41-year-old female graduate student. The sample included both American and international students. They were affiliated with diverse academic disciplines, including Agricultural Leadership, Education and Communication (ALEC), Horticulture, Forestry, History, Sports Management, Business, Veterinary Medicine, Education, Geography, Biochemistry, and Health Sciences. Therefore, for reference purposes, the participants were indexed as initials_year of birth_dept.

Initially, participants were requested to fill out an offline survey comprising both open-ended and close-ended questions related to demographic details and information about their purchasing experiences with organic produce. Additionally, they were asked to specify the type of information sources they relied on to acquire information about the organic farming industry and the rationale behind their choices. The survey was later used to address information regarding sources of information among different typologies of consumers. Thereafter, they were provided with a blank sorting grid and 41 sticky notes, each containing one Q statement. Participants were instructed to sort the statements into three piles based on their agreement or disagreement, and then arrange the statements on the sorting grid (as seen in Figure 1) according to their relative agreement level, utilizing an 11-point normal distribution grid labeled from "most disagree" to "most agree." Participants were prompted to share their sorting process, and these comments were audio-recorded to offer further insight during the analysis and interpretation phases (Watts and Stenner, 2012).

2.3 Data analysis

After completing data collection, the individual Q sorts and their corresponding ranking scores were entered into a custom Excel sheet template which is associated with the desktop web application Ken-Q (Banasick, 2019). Subsequently, the Q sorts were intercorrelated, and factor analysis was conducted using principal component analysis (PCA) with varimax rotation.

The analysis resulted in a four-factor solution that explained the largest percentage of study variance with the fewest confounding factors, making it the best fit for the analyzed solutions. Each of the four factors had an eigenvalue greater than 1, as recommended by Watts and Stenner (2012), and together they accounted for 54% of the study variance.

Following standard practice (Watts and Stenner, 2012), factors with a minimum of two Q sorts were chosen, with a factor loading value of at least 0.38. Q sorts distributed within the selected factors shared a common perspective on organic farming, as evidenced by the similarity of their sorting pattern.

At a significance level of $p < 0.005$, chosen to ensure better factor distribution, all 18 Q sorts loaded significantly onto one of the four extracted factors. However, four Q sorts were confounded, meaning they loaded onto more than one factor.

Table 1 presents the factor loadings of the participants, indicating the degree to which each Q sort contributed to each factor. This analysis provided valuable insights into the shared perspectives among participants regarding organic farming.

After creating composite Q sorts by combining individual Q sorts representing each factor, these combined Q sorts were represented in an array known as a factor array. The factor array is calculated by averaging the weighted scores of each item from all individual Q sorts associated with a specific factor. Items with higher loadings contribute more to the average weighted score and are more representative of that factor.

Factor interpretation, according to Stephenson (1936), is an abductive process that considers the holistic understanding of item configurations in composite Q sorts or factor arrays. The focus is on identifying items with the highest or lowest rankings in a configuration and examining the interrelationships between items within a factor array while avoiding personal preferences or biases.

The crib sheet method, as described by Watts and Stenner (2012), was utilized for factor interpretation. This involved a deliberative process of engaging with every item in a factor array. In the first phase of interpretation, items were categorized into four primary categories: (1) items with the highest rankings in the factor array (+5, may also include +4 ranked items), (2) items with the lowest rankings in the factor array (−5, may also include −4 ranked items), (3) items ranked higher in the given factor array than in other factor arrays, and (4) items ranked lower in the given factor array than in other factor arrays.

In the second phase of the crib sheet analysis, additional items that did not fall into the four basic categories from the first phase were considered. These items, often ranked near zero, were initially assumed to represent a neutral opinion. However, under unique circumstances, these items proved to be crucial in understanding the overall characteristics of that factor.

Together, these two phases of interpretation effectively described the factors. Participants' comments from the survey-style questionnaire and interviews were also incorporated to illustrate and clarify interpretations. This comprehensive approach provided valuable insights into the factors identified through the Q-methodological study.

3 Results and discussion

3.1 Q study

The Q-methodological study identified four student consumer typologies (as factors) seen in Table 2. While the "Dilettante

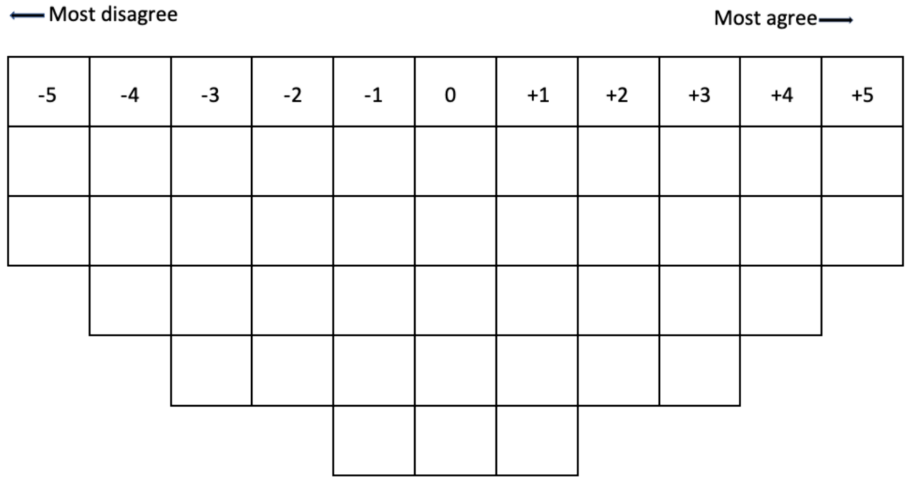

FIGURE 1
Q sort distribution grid.

TABLE 1 Factor loadings of the participants.

Part. no.	Q-sort	Factor 1	Factor 2	Factor 3	Factor 4
12	NA_1995_G_Hort	**0.797**	0.049	0.0364	0.046
9	LD_1981_G_For	**0.725**	−0.037	−0.125	0.221
14	PAR_1993_G_Bus	**0.595**	−0.026	0.248	0.243
5	MB_1993_G_Biochem	**0.571**	−0.113	0.241	**0.478****
7	IAZ_2000_U_Hist	**0.527**	**0.458****	−0.021	0.268
11	NU_1995_G_Geo	0.119	**0.759**	−0.218	0.043
18	SJD_2002_U_Health	−0.058	**0.576**	0.101	**0.526****
1	AG_1992_G_AgCom	−0.148	**0.561**	0.049	−0.056
4	MI_1996_G_Hort	−0.018	**0.560**	0.189	0.094
6	RTM_2002_U_SpMgt	0.370	**0.505**	0.137	−0.211
13	SU_1992_G_AgCom	−0.276	−0.092	**0.714**	0.378
10	AS_1995_G_Bus	0.328	−0.025	**0.621**	−0.002
3	PP_1999_G_Hort	−0.423	0.275	**0.620**	−0.228
8	BT_2001_U_Bus	0.343	0.133	**0.572**	−0.0006
16	EK_2001_U_Vet	0.155	0.091	−0.032	**0.762**
17	MC_2002_U_Ed	0.116	**0.492****	−0.085	**0.650**
2	RPS_1996_G_Hort	0.222	−0.054	0.040	**0.573**
15	KL_2000_U_For	0.309	−0.354	0.214	**0.459**
%Explained variance		23	13	10	8

At $P < 0.005$ **confounding factors.

Consumers" showed a readiness to switch to organic food, recognizing its perceived health and socio-environmental benefits, provided the prices were affordable; the "Decisive Consumers" preferred local produce over both conventional and large-scale organically farmed produce. Despite disagreeing with the socio-environmental and hedonic values associated with organic food, the "Need-based Consumers" preferred eating organic over conventionally farmed food, following a principle of "betterness of one over the other." The "Wandering Consumers" occasionally considered buying organic produce over conventionally farmed options, driven primarily by environmental concerns while dismissing the perceived health benefits of organic eating. These typologies reflect varied perceptions toward organic farming, spanning from tentative interest to selective preferences and pragmatic considerations. Understanding these perspectives is crucial for tailoring strategies to promote organic farming and enhance consumer engagement with organic products.

10.3389/fcomm.2024.1414042

TABLE 2 Statement rankings by factor.

Item no.	Statements	Factor arrays			
		F1	F2	F3	F4
1	Organic produce is more nutritious than produce grown conventionally.	5	3	−1	1
2	Organic produce is safer than produce sourced from conventional farms.	3	−1	0	5
3	Produce from organic farming has fewer calories.	−3	−4	−1	−4
4	Organic produce is fresher and more flavorful in comparison to the produce sold otherwise.	3	−1	0	−1
5	The health benefits of eating organic have been over-hyped.	−4	1	1	0
6	Organic eating prolongs life expectancy.	4	−2	−2	0
7	Organic means Natural.	1	−4	1	−1
8	The danger of pesticide intake from produce grown on conventional farms is often overblown.	−2	0	2	−5
9	Organic farming equals sustainability.	5	0	0	4
10	Organic does not mean "pesticide free."	−2	4	1	−1
11	Organic farming mitigates global warming	2	−5	1	1
12	Mass-produced organic uses much more fossil fuels for its production in comparison to the same amount of produce grown conventionally.	−1	−1	−4	0
13	Many conventional farmers adopt organic strategies to improve soil fertility and biodiversity.	1	2	−3	1
14	Eating organic is a form of environmental activism.	2	−3	4	−3
15	Organic labels build trust and credibility between producers and consumers.	4	1	−2	−2
16	It is important to have transparency in the food industry.	4	5	4	5
17	Commercial organic farming is a gateway to fraud in the food industry.	0	3	1	−3
18	Organic labels can sometimes be misleading.	1	4	3	4
19	The motivation behind organic farming on a small farm is very different from what is practiced on commercial scale.	0	3	2	3
20	Commercial organic farming is becoming a modified version of conventional farming.	0	1	3	1
21	Regulations for organic farming are weakly enforced.	−1	−3	−4	1
22	Pesticides used in organic farming are less harmful than synthetic pesticides.	1	0	0	−2
23	Mass-manufactured organic produce is equivalent to produce grown conventionally.	−3	0	−2	−3
24	Organic eating is an "Ideology."	−5	−3	2	−3
25	Organic eating is a fad.	−3	3	4	−4
26	Eating organic enhances our eco-conscientiousness	3	−2	−1	2
27	Organic farming brings communities together.	2	2	−1	−1
28	Organic produce is pesticide free.	1	−3	−3	3
29	Produce obtained from community-based organic farming is "true organic."	0	2	−3	3
30	Organic farming is not cost-effective.	−3	−1	3	−1
31	The costlier the produce, the better it is in quality.	−5	−4	−5	−5
32	Conventional agriculture is very efficient and relatively cost-effective than organic farming	−2	−1	2	2
33	Organic farming is a marketing gimmick.	−2	2	−2	−4
34	The health benefits of organic eating outweigh its cost.	3	0	0	2
35	Commercialization of organic farming has severely affected the existing small-scale models of organic agriculture.	−1	5	−4	3
36	There is much more food wastage in the organic food industry than in the conventional market.	−4	−2	−5	−2
37	Organic food is expensive because organic farming is expensive.	−1	1	5	4
38	The yields obtained from traditional organic farming methods are insufficient to meet the demands of the growing population worldwide.	2	1	3	0
39	Organic produce is costly because the demand for organic is rising.	−1	4	−3	0
40	Organic farming uses more resources than conventional farming.	0	−5	1	−2
41	Organic farming is suitable for wealthier countries.	−4	−2	5	2

3.1.1 Factor 1: the dilettante consumers

Factor 1 had an eigenvalue of 4.062 and explained 23% of the study variance (as seen in Table 2). The participants in this factor comprised four female Millennials from different graduate schools, such as business, horticulture, forestry, and biochemistry. Only one male undergraduate (Gen Z) was part of this factor. They answered "yes" when asked if they knew about organic farming and had heard about small-scale and large-scale organic farming. Each participant bought produce at least once weekly from commercial grocery chains such as Walmart and Kroger. Although all participants expressed a strong willingness to purchase organic food products but raised concerns about affordability due to high prices. While most of them used social media platforms, such as YouTube and Instagram, to obtain information regarding organic farming, they also consumed news articles as their information source. The undergraduate student, however, preferred watching YouTube channels, for example, "Self Sufficient Me" and "The Weedy Garden," as their knowledge source regarding organic farming and expressed their desire to start a kitchen garden inspired by the content from these channels. These consumers identified source attractiveness and trustworthiness as key factors contributing to their viewership of these social media platforms.

The dilettante consumer strongly believed that organic produce is more nutritious, fresher, flavorful, and safer (01: +5, 04: +3, 02: +3) than food produced conventionally. They argued that organic produce is pesticide-free (28: +1) and that the dangers of pesticide intake from conventional farming are not overblown (08: −2); therefore, eating organic would prolong life expectancy (06: +4). They strongly disagreed that the health benefits of eating organic food have been over-hyped (05: −4) and agreed that the benefits outweigh the cost (34: +3). As one of the participants quoted, "*The health benefits of eating organic food are legitimate. There is no joke about it.*" Another participant reported, "*Advertisements help people make informed decisions about a product that is new in the market. Organic food is relatively new, and therefore, the hype is justified.*" Hence, organic farming is neither a marketing gimmick (33: −2) nor an ideology (24: −5). Organic eating is not a fad (25: −3) "*People are driven toward eating organic because of its health benefits and not because their favorite influencer or friend asked them to do so.*"

Interestingly, the consumers reasoned that their knowledge of small-scale and large-scale organic farming was limited. Therefore, they were neutral in their beliefs about fraud in the organic food industry (17:0), the motivation behind small-scale and large-scale organic farming (19:0), and the fact that commercial organic farming is becoming a modified version of conventional farming (20:0). Despite their neutral stance, they strongly opposed the statement that mass-manufactured organic produce is equivalent to produce grown conventionally (23: −3). When asked why, one of them responded, "*Organic farming practices are very different from their conventional counterparts, irrespective of the scale. The produce from the two types of farming methods is certainly different.*" Hence, they strongly supported organic labels to build trust and credibility between producers and consumers (15:4).

The five participants believed that organic farming has the potential to mitigate global warming (11: +2) and is sustainable (09: +5). While one of the participants answered, "*In my opinion, organic farming uses efficient machinery*," the other stated, "*If each of us decides to grow our food, imagine how much resources we will be able to save even in terms of fossil fuel consumption.*" They strongly disagreed that the cost of the product determines its quality (31: −5): "*Just because something is costly, it may not be better quality. It will be cheaper for me to grow my produce and achieve great quality.*" Neither did they support the statement that organic produce is costly because of the rising demand (38: +2) nor due to the expensive farming practices (37: −1). One consumer said, "*Demand is only partially responsible for the price. Organic farming is novel; therefore, some resources are used more than required during experimentation. Hence, more costly than conventional produce.*" Their opinion of organic farming paralleled subsistence farming. Therefore, participants strongly believed that eating organic food enhances eco-consciousness (26: +3) and is a form of environmental activism (14: +2). They also agreed that organic farming brings communities together (27: +2): "*Every country has the potential to adopt organic farming only if every individual is willing to invest their time and energy*" (41: +4).

3.1.2 Factor 2: the decisive consumers

Factor 2 had an eigenvalue of 2.418 and explained 13% of the study variance (as seen in Table 2). The participants in this factor comprised both Millennials and Gen Z. Five participants were significantly associated with this factor. Two of the participants were females, and three were males. Of the two females, one was an undergraduate student in health sciences, while the other was a graduate student in the Department of Geography. Two of the three males were Millennials pursuing their PhDs in the Department of Horticulture and ALEC, respectively. The third male participant was an undergraduate in Sports Management. All of them answered "yes" when asked if they knew about organic farming and had heard about small-scale and large-scale organic farming. Most of the participants in the group purchased produce from commercial grocery chains such as Walmart and Kroger and did not prefer to purchase organic labeled produce. Out of the five participants, three had experience with cultivating their produce due to their passion for farming. Each participant admitted to having seen or followed some form of social media, either YouTube or Instagram as their information source about organic farming. As one of the graduate students from Ag Com stated that they followed authors/farmers like *Greg Judy* and *Joel Salatin* on YouTube for the latest trends in the organic farming industry. Some of these consumers also leaned toward scientific journals and news articles occasionally. When asked why they preferred social media platforms as their dominant source of information, each stated easy accessibility, user-friendliness, and source trustworthiness as the key factors.

The decisive consumers strongly supported the notion of transparency within the food industry (16: +5). When asked for their reasoning, they cited factors such as health, allergies, social responsibility, and sustainability. When asked about organic produce, they strongly disagreed that the word organic implies natural (7: −4). Organic produce available in the markets may not necessarily be grown without synthetic chemicals and pesticides (10: +4): "*Natural means free of all chemicals and pesticides, which I guess organic is not.*" While they agreed with the statement that organic labels build trust and credibility between producers and consumers (15: +1), consumers also believed that the regulations for organic farming are weakly enforced (20: +1). One of the consumers who had been growing her produce back in her country clarified, "*Something can be grown in a natural environment and not have an organic label. It depends on how much labels mean to you.*" The participants believed

that produce obtained from community-based organic material is truly organic (29: +2), as it promotes collective interest in society (27: +2). They also felt commercial organic farming is a gateway to fraud in the food industry (17: +3) and is becoming a modified version of conventional farming (15: +1). When asked why they believe that the motivation behind small-scale and large-scale organic farming is different (19: +3), one of the participants stated, "*Large-scale organic farming has become a money-making business* (33: +2) *that is affecting small-scale farmers who sought to practice organic farming locally*" (35: +5). However, one of the participants had a slightly different perspective and said, "*Sometimes though, there might not be any difference in the motivation behind the small-scale and large-scale farmers practicing organic farming. It all depends on whether someone can (capital) expand their business to a larger scale*."

Despite their beliefs regarding the large-scale organic farming industry and that organic label can sometimes be misleading (18: +4), participants maintained a neutral position when asked if they would consider mass-manufactured organic produce equivalent to conventional produce (23:0). They presumed that there are some differences in the way produce is farmed in both industries but were unsure when asked to further elaborate on those possible differences. However, the participants disagreed with the statements that organic farming uses more resources than conventional farming does (40: −5) and that mass-manufactured organic farming uses much more fossil fuels during production than conventional farming does (12: −1). Interestingly, they also strongly disagreed that organic farming mitigates global warming (11: −5). They believed that organic farming might use the same amount of fossil fuels as conventional farms, if not more. They defined sustainability in terms of human resources and the fossil fuels expended in the form of fertilizers and energy for machinery. Participants maintained a neutral stance when asked if they would consider organic farming sustainable (09:0): "It is variable across different places as well as countries."

The decisive consumers were further asked about their opinion on the health benefits of eating organic food. Neither of the participants believed that there is any relationship between organic farming and calorie content in the produce (03: −4) or that organic produce is safer than conventionally grown produce (02: −1). They also disagreed that organic eating could prolong life expectancy (06: −2). As one of the participants explained, "*Maintaining a healthy lifestyle is key to prolonging life expectancy by a few years. This may include proper diet, regular exercise, abstinence from harmful substances, and practices such as smoking*." They also believed that when produce is sourced locally, it is fresher and more flavorful irrespective of whether it is organic or not (04: −1). Although the participants felt that the health benefits of eating organic material have been over-hyped (05: +1), they also believed that organic produce grown on a local scale is more nutritious than produce grown conventionally (01: +3). This could be because most participants had personal experience growing and consuming organic produce.

All five consumers strongly agreed that organic produce is costly because of its rising demand (39: +4) and that organic consumption is a fad (25: +3). One of them highlighted, "*Most people consume organic simply because it is in fashion. My mother buys organic because other aunties buy organic*." They also considered organic eating neither enhances eco-consciousness (26: −2) nor is it a form of environmental activism (14: −3). As mentioned by one of the undergraduates, "*I know many who gravitate toward organic eating without having thought of how and what it can contribute to the environment*." They disagree that organic eating is an ideology (21: −3). As one of them explained, "*The market drives the trend of eating organic; people follow the trend for the sake of it…not necessarily because it appeals to their belief system*."

3.1.3 Factor 3: need-based consumers

Factor 3 had an eigenvalue of 1.88 and explained 10% of the study variance (as seen in Table 2). It comprised two female and one male graduate student from the Department of Agricultural Communication, Horticulture, and Business respectively, and one undergraduate student from the College of Business. All the consumers purchased their produce from commercial food chains and were unwilling to buy organic produce due to its cost. Therefore, should the price decrease, they may also consider purchasing organic food. The participants admitted to having limited knowledge about the distinctions between small- and large-scale organic farming, relying primarily on social media platforms such as Instagram and YouTube for information. They did not necessarily follow a specific channel or page but consumed information via Instagram reels and YouTube shorts as it is easy to get into those in a short span of time.

These consumers could be seen as having mixed perceptions about organic farming. The need-based consumers strongly disagreed that price could determine the quality of the produce (31: −5). Moreover, they also believed that organic food cannot prolong life expectancy (6: −2). Even though consumers admitted to knowing little about small- and large-scale organic farming practices, they believed that the commercialization of the organic industry has not affected existing small-scale organic models (35: −4). However, they agreed that the motivations behind small-scale and large-scale organic farming are different (19: +2). They also strongly disapproved that small-scale organic farming could be considered truly organic (29: −3). They firmly believed that organic food is expensive because organic farming practices are expensive (37: +5) and that it is suitable for wealthier countries (41: +5) due to its cost (30: +3). They strongly disagreed with the statement that food wastage in the organic industry is greater than that in the conventional farming industry (36: −5). As one of them quoted, "*Food wastage is everywhere, and it will not be fair to highlight one industry over the other.*"

Need-based consumers believed that organic food might not be more nutritious than conventional produce (1: −1), and neither does it have fewer calories (3: −1). In addition, the organic farming industry may not be pesticide-free (28: −3), and the danger of pesticide intake from produce grown conventionally is often overblown (8: 2). The regulations in the organic food industry, however, are not weakly enforced (21: −4), and the produce from large-scale organic farming is not equivalent to produce grown via conventional practices (23: −2).

While they held almost neutral positions in terms of their perceptions about the implications of organic farming on the environment (9:0; 11: +1; 2:0), they agreed that eating organic food is a form of environmental activism (14:4). On the other hand, they also agreed that organic eating could be considered a fad (25: +4) or an ideology (24: +2). As one of them mentioned, "*While there are those that can purchase organic food for the environment, there are others who do it because of its popularity*."

3.1.4 Factor 4: the wandering consumers

Factor 4 had an eigenvalue of 1.511 and explained 8% of the study variance (as seen in Table 2). It comprised four participants, including two females and one male undergraduate from veterinary sciences, forestry, and education. There was only one male graduate student from the Department of Horticulture. While all of them bought their produce from Walmart and Kroger, they also considered purchasing fresh produce from local farmer's markets and stores such as Earth Fare, Sprouts, and Trader Joe's. Every participant confirmed familiarity with organic farming through their classes, news articles, and social media platforms like Instagram and YouTube. Unlike other consumers, wandering consumers did not follow any dedicated page, channel for their information on organic farming. Rather they found themselves consuming organic farming related videos occasionally majorly because of ease of accessibility. And hence admitted having a lack of understanding regarding small-scale and large-scale organic farming practices.

Wandering consumers strongly believed that pesticides used in conventional farming are harmful (08: −5) and that organic produce is safer because it is pesticide-free (02: +5; 28: +3). Thus, making organic produce comparatively more nutritious (01: +1). While they maintained that organic eating might enhance eco-consciousness (26: +2), it is not a form of environmental activism (14: −3). As one of them quoted, "*Environmental activism involves a lot of sacrifices that may or may not involve eating organic, although it may make an individual feel that they are contributing to the environment*." Another participant mentioned, "*The organic market is consumer-driven; people make their own choices irrespective of any advertising*" (25: −4, 33: −4, 24: −3). Furthermore, organic farming is sustainable (09: +4), as it uses fewer resources than conventional farming (40: −2).

Although the consumers lacked awareness about small-scale and large-scale organic farming practices, they believed that mass-manufactured organic produce is not equivalent to produce grown conventionally (23: −3). One participant said, "*It is not possible to put organic and conventional farming on the same pedestal*." In their opinion, community-based organic food is truly organic (29: +3) but were unsure how the farming practice could lead to rapport building among people (27: −1). In addition, organic labels may not necessarily build trust and credibility between producers and consumers (15: −2), and there might be instances where regulations are weakly enforced (21: +1). The industry, however, is not fraudulent (17: −3). One of the undergraduates said, "*Instances of corruption can be found in any industry; it would be rather unfair to say that the organic industry is a fraud*."

3.2 Consensus statements

Although the factors had divergent perceptions, they also agreed on some common Q statements. For example, for all four factors, transparency was important in the food industry (16: +4, +5, +4, +5). Furthermore, three factors also suggested that yields obtained from traditional organic farming practices are insufficient to meet growing demands, while the fourth factor was neutral (38: +2, +1, +3, 0). However, they strongly disagreed that one can assess the quality of the produce by its cost (31: −5, −4, −5, −5).

In addition to the shared opinions, all factors when questioned about their preference for social media platforms over other information sources, cited the content's entertainment value and ease of access as some of the possible reasons. While some were influenced by influencers and YouTubers, as observed among dilettante consumers, others came across posts and vlogs related to organic farming either coincidentally or after engaging in discussions on organic farming in class or elsewhere. However, it remained unclear to what extent expertise influenced young consumers in evaluating the credibility of the content on social media.

4 Conclusion

In this study, we aimed to develop typologies of student consumers based on their perceptions of organic farming and subsequent purchasing behaviors. In addition to examining their differing perspectives and rationales, we assessed whether the type of media sources consumed varied across the different typologies. Consequently, we investigated to some extent the potential media attributes that influence student consumers' choices of primary information sources related to the organic farming industry.

We identified four typologies of student consumers (as factors), namely, the dilettante consumer, the decisive consumer, the need-based consumer, and the wandering consumer. It was seen that their perspectives ranged across a spectrum from agreement to disagreement regarding organic food and organic farming as a sustainable form of agriculture. We observed heterogeneity between and within the factors. Despite being distributed differently, each factor consisted of consumers with varying racial profiles, spanning across different generational cohorts and educational backgrounds. Therefore, student consumers' perceptions could not be discerned based on their demographic background.

The dilettante consumers exhibited a willingness to adopt organic food primarily due to the perceived health benefits. They, however, also demonstrated a limited understanding of the practices involved in both small-scale and large-scale organic farming. In contrast, the decisive consumers expressed firm opinions on the socio-environmental impacts of organic farming. They hesitated to buy organic food, believing that the potential health benefits of organic eating were based on an exaggerated perception of the risks of pesticide intake from conventional produce. However, they would prefer eating locally produced food over food from conventional farming as they were equally conscious of the negative socio-environmental impacts of conventional farming practices. Need-based consumers doubted the health benefits of organic eating but maintained that the socio-environmental impacts of large-scale organic farming practices were significantly different from those of conventional farming. And thus, cannot be compared. Hence, they would rather eat organic if it were affordable. Lastly, the wandering consumers were convinced that organic farming is sustainable, and that eating organic food is safer than eating produce from conventional farming. However, like other factors, they found organic food costly for regular consumption (Tandon et al., 2021) and were therefore flexible in their choice, opting for either conventionally or organically grown produce. For the type of student consumers who preferred eating organic, perceived safety and ethical considerations played a vital role in their built perception of the organic farming industry (Nasir and Karakaya, 2014; Lee and Yun, 2015; Curvelo et al., 2019;

Ghali, 2020). However, the perceived prestige associated with eating organic did not influence either their perception or purchase decisions.

Students, as consumers, presented contradictory perspectives regarding the advantages of the organic farming sector, suggesting that the perceived benefits of organic consumption may not align with a robust body of scientific evidence-based knowledge on the matter. Consequently, leading to dissonance between students' perceptions and their actual purchasing behavior (Hidalgo-Baz et al., 2017). While cost has always been identified as one of the primary inhibitors for buying organic produce (Tandon et al., 2021), but it is possible that inadequate information or a holistic knowledge on organic farming sector could also be an underlying reason for such discrepancy. However, caution is warranted in making such causal claims. Nonetheless, this could serve as an impetus for future studies.

We discovered that social media emerged as the major information source across all the four typologies of student consumers. They relied on these platforms largely due to its engaging content and ease of accessibility (Wathen and Burkell, 2002; Sayyed and Gupta, 2020; Serbanescu, 2022). While some student consumers were drawn to social media influencers (Lou and Yuan, 2019) as trusted information sources on platforms like Instagram, others opted for YouTube for DIY videos and organic farming tutorials. Hence, media attributes such as source attractiveness and perceived trustworthiness (Giffin, 1967; McGuire, 1985; Hall, 2015) may have contributed to these young consumers leaning toward social media as a reliable information source, though this is not definitive. However, the extent to which these consumers rely on source expertise (McCroskey, 1966) is debatable. These observations align with previous literature and Pew Research 2022 survey findings indicating that younger generations tend to use social media as their primary information source for purchase decisions (Aubrun et al., 2005; Kuttschreuter et al., 2014). This also highlights the potential perils of digital echo chambers on students' perceptions and buying behavior (Cinelli et al., 2021), particularly in the context of a contentious topic like the organic farming industry (Reganold and Wachter, 2016). Interestingly, it was observed that individuals who embraced organic food often came from backgrounds steeped in a culture of organic eating or were engaged in some form of subsistence farming. However, they chose to eat local organic vs. organic from large-scale farming. This suggests that experiential learning plays a significant role in enhancing young consumers' understanding of the broader socio-environmental implications of the food industry (Eugenio-Gozalbo et al., 2021).

4.1 Implications

With recent advancements leading to the USDA enforcing new regulations to monitor fraud in organic food supply chains (National Organic Coalition, 2024), the diverse and unique perspectives of consumers on organic farming and food become increasingly relevant. This is crucial for establishing trust and credibility not only for the organization but also for the entire food industry. While prior studies investigated the "what" and "how" of consumer perceptions toward organic food and farming, very few have focused on the "why(s)" especially among student consumers. We incorporated the Q methodology and recognized that while student consumers might resonate with the same sentiment (and degree) about organic food and farming, their underlying arguments varied. This implies that nuanced developments in the organic farming industry need to be disseminated to the audience in a streamlined fashion that not only presents the facts and the figures but also addresses them in coherence with the unique perspectives identified through the study.

Amidst the growing prominence of food choice debates concerning Genetically Modified Organisms (GMO) and hyper-local products in contemporary agricultural research, this study assumes significance (Hunt and Wald, 2020). The findings underscore the importance of this research, as they reveal that a significant number of student consumers, although demonstrate pro-environmental concerns (Poortinga et al., 2019; Walker and Matsa, 2021; Belotti et al., 2022), lack clarity regarding terminologies associated with organic farming. Moreover, they frequently interchange these terms based on their subjective interpretations through chosen knowledge sources. Therefore, recognizing a gap in their comprehension suggests that similar misunderstandings may persist in the aforementioned debates as well.

While marketing agencies adeptly employ emotional advertising targeted at younger audiences through social media platforms (Yiridoe et al., 2005; Hughner et al., 2007; Thøgersen, 2010; Aertsens et al., 2011; Smith-Spangler et al., 2012), there remains a noticeable absence of concerted efforts from the scientific community to disseminate knowledge in a manner accessible and comprehensible to these audiences. This discrepancy between scientific discoveries and scientific communication creates a gap that needs bridging (Pornpitakpan, 2004; Hunt and Wald, 2020). Therefore, stakeholders, including the scientific community, policymakers, agricultural experts, and educational leaders, must recognize the importance of leveraging platforms such as YouTube and Instagram to capture the attention of both Millennials and Gen Z. Effectively utilizing the unique features of these platforms is paramount in attracting and engaging youth. Furthermore, fostering critical thinking skills and promoting food and media literacy among young people (Bergsma and Carney, 2008; Glik and Martinez, 2017; Payne-Sturges et al., 2018; Raskind et al., 2019) is imperative in reducing the risks associated with unreliable sources on social media.

Additionally, we believe that the utilization of Q methodology remains largely untapped within the realm of Agricultural Education and Communication. There is a significant opportunity to harness its potential further to delve deeper into producer-consumer perceptions regarding science and innovation in agriculture.

4.2 Limitations

Part of the objective of this study was to elucidate the different perspectives of student consumers (in the form of typologies) regarding organic food and farming through a meticulously constructed Q set that encapsulates the broader worldview of the topic. While a portion of the methodology employs quantitative analysis to categorize perspectives into factors, the qualitative insights derived from individual subjectivities lend credibility to the study. However, it is important to note that this study does not assert the generalizability and validity of the entire consumer population; rather, the results are indicative of the sample under study. Secondly, since most of the participants may not be familiar with Q methodology, it is crucial to acknowledge that data collection can pose challenges and be time intensive when using this

methodology in research. Therefore, it necessitates meticulous planning and supervision both before and during the process to ensure accuracy and reliability. Finally, while this investigation examines the media types that student consumers use to shape their perceptions of the organic food industry, future research could employ alternative methodologies with a larger sample size. It could also thoroughly explore additional media attributes beyond source attractiveness, such as ease of access, user-friendliness, trustworthiness, and expertise, which may influence different consumer typologies.

Data availability statement

The original contributions presented in the study are included in the article/Supplementary material, further inquiries can be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by Ethics Committee of the University of Georgia (No. PROJECT00004479). The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

SN: Conceptualization, Data curation, Formal analysis, Investigation, Methodology, Visualization, Writing – original draft, Writing – review & editing. JC: Project administration, Resources, Supervision, Visualization, Writing – review & editing. KD: Resources, Supervision, Validation, Writing – review & editing.

Funding

The author(s) declare that no financial support was received for the research, authorship, and/or publication of this article.

Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Publisher's note

Supplementary material

The Supplementary material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fcomm.2024.1414042/full#supplementary-material

References

Adams, D. C., and Salois, M. J. (2010). Local versus organic: a turn in consumer preferences and willingness-to-pay. *Renew. Agric. Food Syst.* 25, 331–341. doi: 10.1017/S1742170510000219

Aertsens, J., Mondelaers, K., Verbeke, W., Buysse, J., and Van Huylenbroeck, G. (2011). The influence of subjective and objective knowledge on attitude, motivations and consumption of organic food. *Br. Food J.* 113, 1353–1378. doi: 10.1108/00070701111179988

Atkins, M. T. (2019). Creating age-friendly cities: prioritizing interventions with Q-methodology. *Int. Plan. Stud.* 25, 303–319. doi: 10.1080/13563475.2019.1608164

Aubrun, A., Brown, A., and Grady, J. (2005). "Harmful and productive patterns in newspaper representations of food systems" in Perceptions of the US Food System: What and How Americans Think about their Food (East Battle Creek, MI: Kellogg Foundation), 57–87.

Banasick, S. (2019). KADE: a desktop application for Q methodology. *J. Open Source Softw.* 4:1360. doi: 10.21105/joss.01360

Barnes, C., Angle, J., and Montgomery, D. (2015). Teachers describe epistemologies of science instruction through Q methodology. *Sch. Sci. Math.* 115, 141–150. doi: 10.1111/ssm.12111

Belotti, F., Donato, S., Bussoletti, A., and Comunello, F. (2022). Youth activism for climate on and beyond social media: insights from FridaysForFuture-Rome. *Int. J. Press Politics.* 27, 718–737. doi: 10.1177/19401612211072776

Bergsma, L. J., and Carney, M. E. (2008). Effectiveness of health-promoting media literacy education: a systematic review. *Health Educ. Res.* 23, 522–542. doi: 10.1093/her/cym084

Best, H. (2008). Organic agriculture and the conventionalization hypothesis: a case study from West Germany. *Agric. Hum. Values* 25, 95–106. doi: 10.1007/s10460-007-9073-1

Boobalan, K., Sivakumaran, B., and Susairaj, M. (2022). Organic food preferences: a comparison of American and Indian consumers. *Food Qual. Prefer.* 101:104627. doi: 10.1016/j.foodqual.2022.104627

Brown, S. R., Durning, D. W., and Selden, S. C. (2008). Q methodology. In: Public Administration and Public policy. Eds. K. Yang and G. J. Miller. (Boca Raton, FL: CRC Press, Taylor & Francis). 134, 721–763.

Bumbudsanpharoke, W., Moran, D., and Hall, C. (2009). Exploring perspectives of environmental best management practices in Thai agriculture: an application of Q-methodology. *Environ. Conserv.* 36, 225–234. doi: 10.1017/S0376892909990397

Cerjak, M., Mesić, Ž., Kopić, M., Kovačić, D., and Markovina, J. (2010). What motivates consumers to buy organic food: comparison of Croatia, Bosnia Herzegovina, and Slovenia. *J. Food Prod. Mark.* 16, 278–292. doi: 10.1080/10454446.2010.484745

Cicia, G., Del Giudice, T., and Ramunno, I. (2009). Environmental and health components in consumer perception of organic products: estimation of willingness to pay. *J. Food Prod. Mark.* 15, 324–336. doi: 10.1080/10454440902925930

Colatruglio, S., and Slater, J. (2016). Challenges to acquiring and utilizing food literacy: perceptions of young Canadian adults. *Can. Food Stud.* 3, 96–118. doi: 10.15353/cfs-rcea.v3i1.72

Cinelli, M., De Francisci Morales, G., Galeazzi, A., Quattrociocchi, W., and Starnini, M. (2021). The echo chamber effect on social media. *Proceedings of the National Academy of Sciences*. 118. doi: 10.1073/pnas.2023301118

Curvelo, I. C. G., Watanabe, E. A. D. M., and Alfinito, S. (2019). Purchase intention of organic food under the influence of attributes, consumer trust and perceived value. *Rev. Gestão.* 26, 198–211. doi: 10.1108/REGE-01-2018-0010

Davis, C. H., and Michelle, C. (2011). Q methodology in audience research: bridging the qualitative/quantitative 'divide' participations. *J. Aud. Recept. Stud.* 8, 559–593.

de Graaf, G. (2007). Veterinary students' views on animal patients and human clients, using Q-methodology. *J. Vet. Med. Educ.* 34, 127–138. doi: 10.3138/jvme.34.2.127

Derksen, D. M., and Mithöfer, D. (2021). Identifying stakeholders' opinions on sustainability implementation in floriculture with Q methodology. In IV international symposium on horticulture in Europe-SHE2021 1327. 771–780.

Dimitri, C., and Dettmann, R. L. (2012). Organic food consumers: what do we really know about them? *Br. Food J.* 114, 1157–1183. doi: 10.1108/00070701211252101

Duenckmann, F. (2010). The village in the mind: applying Q-methodology to re-constructing constructions of rurality. *J. Rural. Stud.* 26, 284–295. doi: 10.1016/j.jrurstud.2010.01.003

Edenbrandt, A. K., Lagerkvist, C. J., and Nordström, J. (2021). Interested, indifferent or active information avoiders of carbon labels: cognitive dissonance and ascription of responsibility as motivating factors. *Food Policy* 101:102036. doi: 10.1016/j.foodpol.2021.102036

Eugenio-Gozalbo, M., Ramos-Truchero, G., and Suárez-López, R. (2021). University gardens for sustainable citizenship: assessing the impacts of garden-based learning on environmental and food education at Spanish higher education. *Int. J. Sustain. High. Educ.* 22, 516–534. doi: 10.1108/IJSHE-06-2020-0208

Flanagin, A., and Metzger, M. J. (2017). "Digital media and perceptions of source credibility in political communication" in *The Oxford handbook of political communication*, Eds. K. Kenski and K. H. Jamieson (New York: Oxford University Press). 417, 417–436.

Fleming-Milici, F., and Harris, J. L. (2020). Adolescents' engagement with unhealthy food and beverage brands on social media. *Appetite* 146:104501. doi: 10.1016/j.appet.2019.104501

Forman, J., Silverstein, J., Committee on NutritionCouncil on Environmental HealthBhatia, J. J., Abrams, S. A., et al. (2012). Organic foods: health and environmental advantages and disadvantages. *Pediatrics* 130, e1406–e1415. doi: 10.1542/peds.2012-2579

Geary, D. L. (2005). The decline of media credibility and its impact on public relations. *Public Relat. Q.* 50:8.

Ghali, Z. Z. (2020). Effect of utilitarian and hedonic values on consumer willingness to buy and to pay for organic olive oil in Tunisia. *Br. Food J.* 122, 1013–1026. doi: 10.1108/BFJ-06-2019-0414

Giffin, K. (1967). The contribution of studies of source credibility to a theory of interpersonal trust in the communication process. *Psychol. Bull.* 68, 104–120. doi: 10.1037/h0024833

Glik, D., and Martinez, S. M. (2017). College students identify university support for basic needs and life skills as key ingredient in addressing food insecurity on campus. *Calif. Agric.* 71, 130–138. doi: 10.3733/ca.2017a0023

González, P. A., and Parga-Dans, E. (2020). Organic labeling controversies: a means to an end within global value chains. *Renew. Agric. Food Syst.* 35, 109–114. doi: 10.1017/S1742170518000455

Grand View Research. (2022). Organic food and beverages market size, share and trends analysis report by product (organic food, organic beverages), by distribution channel (offline, online), by region, and segment forecasts, 2022–2030 (Report ID: 978–1–68038-095-8). Available at: https://www.grandviewresearch.com/industry-analysis/organic-foods-beverages-market

Grzelak, P., and Maciejczak, M. (2013). Comparison between the United States and Poland of consumers' perceptions of organic products. *Stud. Agric. Econ.* 115, 47–56. doi: 10.7896/j.1302

Hall, J. (2015). Build authentic audience experiences through influencer marketing. (Jersey City, NJ: Forbes).

Hidalgo-Baz, M., Martos-Partal, M., and González-Benito, Ó. (2017). Attitudes vs. purchase behaviors as experienced dissonance: the roles of knowledge and consumer orientations in organic market. *Front. Psychol.* 8:211383. doi: 10.3389/fpsyg.2017.00248

Hovland, C. I., and Weiss, W. (1951). The influence of source credibility on communication effectiveness. *Public Opin. Q.* 15, 635–650. doi: 10.1086/266350

Hughner, R. S., McDonagh, P., Prothero, A., Shultz, C. J., and Stanton, J. (2007). Who are organic food consumers? A compilation and review of why people purchase organic food. *J. Cons. Behav. Int. Res. Rev.* 6, 94–110. doi: 10.1002/cb.210

Hunt, K. P., and Wald, D. M. (2020). The role of scientific source credibility and goodwill in public skepticism toward GM foods. *Environ. Commun.* 14, 971–986. doi: 10.1080/17524032.2020.1725086

Iofrida, N., De Luca, A. I., Gulisano, G., and Strano, A. (2018). An application of Q-methodology to Mediterranean olive production–stakeholders' understanding of sustainability issues. *Agric. Syst.* 162, 46–55. doi: 10.1016/j.agsy.2018.01.020

Ireton, C., and Posetti, J. (2018). Journalism, fake news and disinformation: Handbook for journalism education and training. (Paris: Unesco Publishing). 43:130.

Koswatta, T. J., Wingenbach, G., Leggette, H. R., and Murphrey, T. P. (2023). Factors affecting public perception of scientific information about organic foods. *Br. Food J.* 125, 587–607. doi: 10.1108/BFJ-08-2021-0874

Kuepper, G. (2010). A brief overview of the history and philosophy of organic agriculture. Poteau, OK: Kerr Center for Sustainable Agriculture.

Kun, A. I., and Kiss, M. (2021). On the mechanics of the organic label effect: how does organic labeling change consumer evaluation of food products? *Sustain. For.* 13:1260. doi: 10.3390/su13031260

Kuttschreuter, M., Rutsaert, P., Hilverda, F., Regan, Á., Barnett, J., and Verbeke, W. (2014). Seeking information about food-related risks: the contribution of social media. *Food Qual. Prefer.* 37, 10–18. doi: 10.1016/j.foodqual.2014.04.006

Lanero, A., Vázquez, J.-L., and Sahelices-Pinto, C. (2021). Halo effect and source credibility in the evaluation of food products identified by third-party certified eco-labels: can information prevent biased inferences? *Food Secur.* 10:2512. doi: 10.3390/foods10112512

Lee, H. J., and Yun, Z. S. (2015). Consumers' perceptions of organic food attributes and cognitive and affective attitudes as determinants of their purchase intentions toward organic food. *Food Qual. Prefer.* 39, 259–267. doi: 10.1016/j.foodqual.2014.06.002

Lehrer, N., and Sneegas, G. (2018). Beyond polarization: using Q methodology to explore stakeholders' views on pesticide use, and related risks for agricultural workers, in Washington State's tree fruit industry. *Agric. Hum. Values* 35, 131–147. doi: 10.1007/s10460-017-9810-z

Leifeld, J., and Fuhrer, J. (2010). Organic farming and soil carbon sequestration: what do we really know about the benefits? *Ambio* 39, 585–599. doi: 10.1007/s13280-010-0082-8

Lou, C., and Yuan, S. (2019). Influencer marketing: how message value and credibility affect consumer trust of branded content on social media. *J. Interact. Advert.* 19, 58–73. doi: 10.1080/15252019.2018.1533501

Lundberg, A., de Leeuw, R., and Aliani, R. (2020). Using Q methodology: sorting out subjectivity in educational research. *Educ. Res. Rev.* 31:100361. doi: 10.1016/j.edurev.2020.100361

Magkos, F., Arvaniti, F., and Zampelas, A. (2006). Organic food: buying more safety or just peace of mind? A critical review of the literature. *Crit. Rev. Food Sci. Nutr.* 46, 23–56. doi: 10.1080/10408690490911846

Majerczak, P., and Strzelecki, A. (2022). Trust, media credibility, social ties, and the intention to share towards information verification in an age of fake news. *Behav. Sci.* 12:51. doi: 10.3390/bs12020051

Martens, B., Aguiar, L., Gomez-Herrera, E., and Mueller-Langer, F. (2018). The digital transformation of news media and the rise of disinformation and fake news. *Digital Economy Working Paper 2018-02, Joint Research Centre Technical Reports*. (Spain: European Commission). p53. doi: 10.2139/ssrn.3164170

Maurer, L., Schenkenfelder, J., and Winckler, C. (2021). Resource, collaborator, or individual cow? Applying Q methodology to investigate Austrian farmers' perspectives on motivational aspects of improving animal welfare. *Front. Vet. Sci.* 7:607925. doi: 10.3389/fvets.2020.607925

McCroskey, J. C. (1966). Scales for the measurement of ethos. *Commun. Monogr.* 33, 65–72. doi: 10.1080/03637756609375482

McGuire, W. J. (1985). "Chapter attitudes and attitude change" in *Handbook of social psychology*, 233–346.

Meel, P., and Vishwakarma, D. K. (2020). Fake news, rumor, information pollution in social media and web: a contemporary survey of state-of-the-arts, challenges and opportunities. *Expert Syst. Appl.* 153:112986. doi: 10.1016/j.eswa.2019.112986

National Organic Coalition. (2024). New Organic Rules are on the Horizon for 2024. Available at: https://www.nationalorganiccoalition.org/blog/2024/1/2/new-organic-rules-are-on-the-horizon-for-2024. (Last accessed: July 24,2024).

Nasir, V. A., and Karakaya, F. (2014). Underlying motivations of organic food purchase intentions. *Agribusiness* 30, 290–308. doi: 10.1002/agr.21363

Osei, S., Owusu, M., Pomaa-Yeboah, P., and Boateng, M. (2013). A study of student perception of organic agriculture and organic foods. *Ghana. J. Anim. Sci.* 7, 142–150.

Pate, S. S., and Adams, M. (2013). The influence of social networking sites on buying behaviors of millennials. *Atl. Mark. J.* 2:7.

Payne-Sturges, D. C., Tjaden, A., Caldeira, K. M., Vincent, K. B., and Arria, A. M. (2018). Student hunger on campus: food insecurity among college students and implications for academic institutions. *Am. J. Health Promot.* 32, 349–354. doi: 10.1177/0890117117719620

Pereira, M. A., Fairweather, J. R., Woodford, K. B., and Nuthall, P. L. (2016). Assessing the diversity of values and goals amongst Brazilian commercial-scale progressive beef farmers using Q-methodology. *Agric. Syst.* 144, 1–8. doi: 10.1016/j.agsy.2016.01.004

Poortinga, W., Whitmarsh, L., Steg, L., Böhm, G., and Fisher, S. (2019). Climate change perceptions and their individual-level determinants: a cross-European analysis. *Glob. Environ. Chang.* 55, 25–35. doi: 10.1016/j.gloenvcha.2019.01.007

Pornpitakpan, C. (2004). The persuasiveness of source credibility: a critical review of five decades' evidence. *J. Appl. Soc. Psychol.* 34, 243–281. doi: 10.1111/j.1559-1816.2004.tb02547.x

Qutteina, Y., Hallez, L., Mennes, N., De Backer, C., and Smits, T. (2019). What do adolescents see on social media? A diary study of food marketing images on social media. *Front. Psychol.* 10:491755. doi: 10.3389/fpsyg.2019.02637

Raskind, I. G., Haardörfer, R., and Berg, C. J. (2019). Food insecurity, psychosocial health and academic performance among college and university students in Georgia, USA. *Public Health Nutr.* 22, 476–485. doi: 10.1017/S1368980018003439

Reganold, J. P., and Wachter, J. M. (2016). Organic agriculture in the twenty-first century. *Nat. Plants* 2, 15221–15228. doi: 10.1038/nplants.2015.221

Rodríguez-Bermúdez, R., Miranda, M., Orjales, I., Ginzo-Villamayor, M. J., Al-Soufi, W., and López-Alonso, M. (2020). Consumers' perception of and attitudes towards organic food in Galicia (northern Spain). *Int. J. Consum. Stud.* 44, 206–219. doi: 10.1111/ijcs.12557

Sayyed, B. J. W., and Gupta, R. (2020). Social media impact: generation Z and Millenial on the cathedra of social media. In 2020 8th international conference on reliability, infocom technologies and optimization (trends and future directions) (ICRITO). IEEE, 595–600.

Scialabba, N. E. H., and Müller-Lindenlauf, M. (2010). Organic agriculture and climate change. *Renewable agriculture and food systems*. 25158–169. doi: 10.1017/S1742170510000116

Serbanescu, A. (2022). "Millennials and the gen Z in the era of social media" in *Social media, technology, and new generations: digital millennial generation and generation Z*. Eds. A. Atay and M. Z. Ashlock. (Lanham, Mayland USA: Lexington books). 61.

Smith-Spangler, C., Brandeau, M. L., Hunter, G. E., Bavinger, J. C., Pearson, M., Eschbach, P. J., et al. (2012). Are organic foods safer or healthier than conventional alternatives? A systematic review. *Ann. Intern. Med.* 157, 348–366. doi: 10.7326/0003-4819-157-5-201209040-00007

Statista (2024). Consumption frequency of news from social media in the U.S. 2022, by generation. Available at: https://www.statista.com/statistics/1124159/us-generational-social-media-news/#:~:text=A%202022%20survey%20found%20that,used%20social%20networks%20for%20news (accessed: April 20, 2024)

Stenner, P., Watts, S., and Worrell, M. (2008). "Q methodology" in *The SAGE handbook of qualitative research in psychology*, Eds. C. Willig and W. S. Rogers. (London: SAGE Publications Ltd) 215–239. doi: 10.4135/9781848607927

Stephen, A. T. (2016). The role of digital and social media marketing in consumer behavior. *Curr. Opin. Psychol.* 10, 17–21. doi: 10.1016/j.copsyc.2015.10.016

Stephenson, W. (1936). The inverted factor technique. *Br. J. Psychol.* 26:344.

Stephenson, W. (1993). Introduction to Q-methodology. *Operant Subject.* 17, 1–13. doi: 10.22488/okstate.93.100509

Størksen, I., Thorsen, A. A., Øverland, K., and Brown, S. R. (2012). Experiences of daycare children of divorce. *Early Child Dev. Care* 182, 807–825. doi: 10.1080/03004430.2011.585238

Su, C.-H., Tsai, C.-H., Chen, M.-H., and Lv, W. Q. (2019). US sustainable food market generation Z consumer segments. *Sustain. For.* 11:3607. doi: 10.3390/su11133607

Tandon, A., Dhir, A., Kaur, P., Kushwah, S., and Salo, J. (2020). Why do people buy organic food? The moderating role of environmental concerns and trust. *J. Retail. Consum. Serv.* 57:102247. doi: 10.1016/j.jretconser.2020.102247

Tandon, A., Jabeen, F., Talwar, S., Sakashita, M., and Dhir, A. (2021). Facilitators and inhibitors of organic food buying behavior. *Food Qual. Prefer.* 88:104077. doi: 10.1016/j.foodqual.2020.104077

Taprial, V., and Kanwar, P. (2012). Understanding social media. (London: Bookboon). 61. Available at: https://bookboon.com/en/understanding-social-media-ebook. (Accessed July 24, 2024).

Tariq, A., Wang, C., Tanveer, Y., Akram, U., and Akram, Z. (2019). Organic food consumerism through social commerce in China. *Asia Pac. J. Mark. Logist.* 31, 202–222. doi: 10.1108/APJML-04-2018-0150

Thøgersen, J. (2010). Country differences in sustainable consumption: the case of organic food. *J. Macromark.* 30, 171–185. doi: 10.1177/0276146710361926

Uçar, A., and Özçelik, A. O. (2012). "University student attitudes toward organic foods" in Organic food and agriculture-new trends and developments in the social sciences. (London: IntechOpen). 230.

Wall, M. (2015). Citizen Journalism: A retrospective on what we know, an agenda for what we don't. *Digital journalism* 6, 797–813. doi: 10.1080/21670811.2014.1002513

Walker, M., and Matsa, K. E. (2021). News Consumption Across Social Media in. *Pew Centre Research*. Available at: https://www.pewresearch.org/journalism/2021/09/20/news-consumption-across-social-media-in-2021. (Last accessed: July 24, 2024).

Wathen, C. N., and Burkell, J. (2002). Believe it or not: factors influencing credibility on the web. *J. Am. Soc. Inf. Sci. Technol.* 53, 134–144. doi: 10.1002/asi.10016

Watts, S., and Stenner, P. (2012). Doing Q methodological research: theory, method and interpretation.

Webler, T., Danielson, S., and Tuler, S. (2009). Using Q method to reveal social perspectives in environmental research. Greenfield MA: Social and Environmental Research Institute. *54*, 45.

Whitehead, J. L. (1968). Factors of source credibility. *Q. J. Speech* 54, 59–63. doi: 10.1080/00335636809382870

Williamson, C. S. (2007). Is organic food better for our health? *Nutr. Bull.* 32, 104–108. doi: 10.1111/j.1467-3010.2007.00628.x

Yang, Y., and Montgomery, D. (2013). Gaps or bridges in multicultural teacher education: AQ study of attitudes toward student diversity. *Teach. Teach. Educ.* 30, 27–37. doi: 10.1016/j.tate.2012.10.003

Yiridoe, E. K., Bonti-Ankomah, S., and Martin, R. C. (2005). Comparison of consumer perceptions and preference toward organic versus conventionally produced foods: a review and update of the literature. *Renew. Agric. Food Syst.* 20, 193–205. doi: 10.1079/RAF2005113