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"I feel the weight of expectations": how emotions and social norms shape news choices about superfood diets

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Abstract:

Focusing on "super diets" and different approaches to integrate superfoods in one's diet (i.e., small- vs. large-change approaches), this study examines the drivers behind healthy eating information management (both seeking and avoidance). We combine self-reported data (N = 359) about the individual's affective states (positive (PA), negative (NA), and mixed (MA)) and the perceived informational subjective norms (ISN) with unobtrusively measured news selectivity. The data was analyzed using zero-inflated negative binomial (ZINB) regression models, which simultaneously accounted for the seeking and avoiding healthy eating news. Findings revealed that the seeking behavior could neither be explained by the individual's affective state (negative or mixed), informational subjective norms, nor by their interaction. However, contrary to our predictions, positive affect was not associated with avoiding news about healthy eating. Regarding specific content features, informational subjective norms were the only significant predictor of seeking news featuring large-change approaches to one's diet. While individuals in negative affective states were likely to spend less time on news featuring a small-change approach, individuals with mixed affects were likely to spend more time on news featuring such an approach. The interaction between mixed affect and negative affect with informational subjective norms reversed this relationship. Theoretical and practical implications are discussed.

Keywords: Information Management, Affect, Norms, Healthy Eating, Superfoods

Introduction

Obesity is a significant threat to global public health (Seidell & Halberstadt, 2015), and despite the increased awareness of the importance of healthy eating, unhealthy eating habits continue to persist (Sathyamala, 2017; Verplanken & Orbell, 2022). Media and health campaigns promote dietary changes, leading to the popularity of "super diets" and different approaches to changing one's diet. These approaches range from complete overhauls to replacing certain unhealthy food choices with healthier ones (large-change vs. small-change; Graham et al., 2022).

Food choices are about more than information; the individual's affective state impacts them - and so does the individual's media selection (Reinecke, 2016; Zillmann, 2000). The unprecedented access to information is turning health information into a highly selective behavior (Kim et al., 2016), managed through seeking or avoidance (Link, 2021; Wang et al., 2021). Information management can also be impacted by the perceived pressure to know about healthy eating (e.g., informational subjective norms). However, the interplay between the individual's affective state, informational subjective norms, and media selectivity about healthy eating news remains unclear.

This study draws on the selective exposure paradigm and methodology to simultaneously test the seeking and avoidance behavior of healthy eating revolving around superfood alternatives in the news. First, we explore how affective states (positive (PA), negative (NA), and mixed (MA)) and informational subjective norms (ISN) impact the information management behaviors of healthy eating news featuring superfoods. Second, the study design tests for the information management of specific content-related features (large- vs. small-change approaches) to account for the different ways to integrate superfoods into one's diet.

Information and the Affective State

Affect refers to all feeling-related states (Forgas, 1995), including moods and emotions (see Russell, 1980; Luong & Knobloch-Westerwick, 2023). To consider the role of affective states on information management, we turn to the mood management theory (MMT; Zillmann, 2000) and the risk information-seeking (and avoidance) models (seeking: RISP

and PRISM; Griffin et al., 1999; Kahlor, 2010 and avoidance: PRIA; Deline & Kahlor, 2019;). MMT assumes that mood - an affective state that is diffused and unfocused (Lischetzke, 2014) - motivates individuals to arrange their media stimuli to terminate or alleviate negative affect (NA) and preserve or intensify positive affect (PA) (Reinecke, 2016; Zillmann, 1988). Media selectivity is one mechanism through which individuals regulate their affective state (Knobloch-Westerwick, 2006; Zillmann, 2000).

The selectivity of media content and management of information behaviors has often been examined using the risk information-seeking models (e.g., RISP and PRISM; Griffin et al., 1999; Kahlor, 2010). These models suggested that affects, defined as the individual's emotional valence, directly play a role in self-regulation by motivating the seeking or avoidance of information (Lu et al., 2020; Yang & Kahlor, 2013). While NA predicted information seeking using the RISP model and PRISM (Yang & Kahlor, 2013), such models lacked insight into information avoidance behaviors. Only recently did the planned risk information avoidance (PRIA) model address this gap, suggesting that PA predicts information avoidance (Deline & Kahlor, 2019).

Although these models only consider affective states as a unidimensional evaluation - either positive or negative (Yang et al., 2014), recent studies emphasized the role of mixed affect (MA) – the co-occurrence of both negative and positive affect (Nabi, 2019; Slater et al., 2016). Like NA, which stimulates cognitive elaboration and careful information processing, MA can heighten the elaborative processing and reflection of media messages (Bartsch et al., 2014; Das et al., 2017; Ersner-Hershfield et al., 2008). Given that food choices can often be emotionally charged and require profound reflective thoughts, MA can affect an individual's motivation to learn more about healthier food alternatives (Schneider & Schwarz, 2017; Shepherd, 2002). We hypothesize:

H1 a-b: a) Negative and b) mixed affective states will be associated with the seeking of healthy eating news.

H2: Positive affective state will be associated with avoiding healthy eating news.

Added Pressure: Informational Subjective Norms

Informational subjective norms (ISN) is a crucial predictor of information-seeking behavior (Ou & Ho, 2021; Yang et al., 2014). ISN is the individual's motivation to conform to the perceived social pressure regarding what important others think the individual should know about an issue (Griffin et al., 1999; Kahlor, 2010). Thus, when an individual believes that others expect them to have some knowledge about an issue, they are likely to act and seek information more actively (Griffin et al., 2013).

Although affective state and ISN were identified as factors driving health information management behaviors (Ou & Ho, 2021), gaps in understanding persist regarding the interaction between affective states and social norms (Deline & Kahlor, 2019). Recent findings have challenged the notion that affective states and social norms independently shape information management behaviors, suggesting a positive correlation between informational subjective norms and anticipated and

experienced positive affects (Lu et al., 2020). This underscores the need to examine how affective states and social norms (ISN in our case) jointly predict healthy eating information management behaviors. Thus, we ask:

RQ1: To what extent does the interaction between affective states (positive, negative, and mixed) and ISN predict information management of healthy eating news?

Approaches to Healthy Eating

The superfoods boom has primarily been driven by the perception that these food choices are no ordinary food in that they not only fulfill the individual's desire for a healthier lifestyle but also contribute to the individual's eating identity and social distinction (Graeff-Hönninger & Khajehei, 2019). Consequently, the 'super diet' style has gained popularity in the media (Mintel, 2016; Weitkamp & Eidsvaag, 2014) with calls to use superfoods as part of one's diet more often and more effectively (Tacer-Caba, 2019).

Health campaigns typically advocate for either a small-change or a large-change approach to integrating healthier food choices (Hayes et al., 2021; Hill, 2009). A large-change approach requires substantial changes to an individual's dietary behavior (Graham et al., 2022), which may lead to remarkable short-term results. However, individuals often experience a yoyo-effect, regaining most of their lost weight (Graham et al., 2022). Alternatively, the small-change approach relies on habit formation by empowering individuals to slowly make small, achievable changes to their diet (e.g., swapping one food for a healthier alternative; Hill, 2009; Rodearmel et al., 2007). However, little is known about how the individual's affective state and the pressure to know about healthy eating impacts the selective exposure to a specific healthy eating news approach. Thus, we ask:

RQ2: To what extent does the affective state (positive, negative, and mixed) predict information management about specific features of healthy eating news (i.e., small- vs. large-change)?

RQ3: To what extent does the interaction between affective state (positive, negative, and mixed) and ISN predict information management about specific features of healthy eating news (i.e., small- vs. large-change approaches)?

Method

Participants

A total of 392 participants completed the study. Nine were excluded for exceeding the maximum reading time, while 24 were excluded for not passing the manipulation check or providing implausible responses. The final sample was n = 359 participants. The sample included n = 199 self-identified as female and n = 160 male. Their age ranged from 18 to 77 (M = 29.0, SD = 13.0). Individuals mostly self-identified as Belgian (92.8%).

The participant's Body Mass Index (BMI) was based on self-reported weight and height (M = 23.2, SD = 3.8). The distribution of the BMI was within a healthy range; 5.6% were underweight (BMI < 18.5), 68.0% had a healthy BMI (BMI 18.5 – 24.9), and 21.7% were overweight (BMI of 25.0 - 29.9). About 4.7% had an obese BMI (BMI ≥ 30.0) (CDC, 2021).

The sample included 169 (47.1%) with a higher education degree (bachelor and above), 138 (38.4%) with a high school diploma, 36 (10.0%) with a professional degree (professional bachelor), and 16 (4.5%) with no high school diploma.

Procedure

An online survey was conducted using snowball sampling. After their consent, participants answered demographic and healthy eating-related questions and reported their present affective state. After completing the first part of the study, they were given a link to a mock-up news web magazine (Foody) and asked to browse and select news articles they preferred for up to 5 minutes (Zhu et al., 2024). They were also told that the allocated time was insufficient to read all articles. Once they received the instructions, they were redirected to the Foody landing page featuring eight news articles, and their time began. Towards the end of their time, a pop-up window notified them before they were redirected to the second part of the survey, which focused on their reading experience and information processing. After completion, participants were debriefed about the study's purpose. The answers from both parts of the survey combined with the individual's browsing patterns were merged, thus relating the information-seeking behavior with the individual's characteristics (Zhu et al., 2024).

Materials

News articles were adapted from different news media sources and edited to have the same length (800 words). To eliminate any presentation-order effects (Elsenberg & Barry, 1988), the content randomization function in WordPress was used, which displayed the news articles in a random order each time the landing page was loaded. Similar images were used to avoid possible visual preferences (Wells & Windschitl, 1999). All articles focused on superfood alternatives; however, their content-related features differed - four articles encouraged a small-change approach, and four encouraged a large-change approach, all revolving around superfoods). The approach featured in the new article could be inferred from its title (see Figure 1). The study included two content-related features: statistical information vs. exemplars and small- vs. large-change approaches. However, only the small- vs. large-change content factor is relevant for theorizing this study.

Measures

Information Management. Information management was conceptualized as the time, in seconds, a participant spent on a news article. We employed the selective exposure paradigm (Hastall & Knobloch-Westerwick, 2013) and measured selectivity using unobtrusive observations of media exposure. This approach avoids many shortcomings associated with self-reported measurements (Hastall & Knobloch-Westerwick, 2013). Participants could choose any article to read and go back and forth between the landing page and the full article chosen. By clicking on an article, they were taken to the full article, and the time spent was captured in seconds. Individuals could only read one article at a time; thus, articles not chosen were coded as zero, indicative of selective avoidance. The participants' total browsing time (M = 86.8, SD = 80.7) as well as the time they spent on specific content-related features: small-change (M = 43.9, SD = 61.5) and large-change (M = 42.8, SD = 56.4), was captured automatically and unobtrusively.

Affective States. Affective states were measured using the Short-Form of the Positive and Negative Affect scale (I-PANAS-SF; Thompson, 2007). Individuals were asked, "Thinking about yourself and how you normally feel, to what extent do you feel right now …?" and their responses were assessed on a 5-point scale ranging from 1 = strongly disagree to 5 = strongly agree. Responses indicated the current affective state using five positive (determined, attentive, alert, inspired, active; Cronbach's α =.73; M = 3.25, SD = .67) and five negative affects (afraid, nervous, upset, ashamed, hostile; Cronbach's α = .80; M = 1.92, SD = .77).

Mixed Affect. Mixed affect was computed following the procedure outlined by Ersner-Hershfield et al. (2008). The same equation was applied, but the affective states rather than discrete emotions were used:

$$MA = MIN [Positive\ Affect,\ Negative\ Affect]$$

Positive and negative affects needed to be high to obtain a high score on mixed affect, whereas low positive or negative affect levels resulted in a low mixed affect score (M = 1.85, SD = .66).

Informational Subjective Norms. ISN was measured using 4-items adapted from Kahlor (2007), which included, "People whose opinion I value would like me to be informed about healthy eating and food." The responses ranged from 1 = strongly disagree to 7 = strongly agree, and all items were combined into a composite measure (Cronbach's α = 0.77; M = 4.2, SD = 1.1). The wording of all items can be found in Appendix 1.

Covariates. The covariate variables included age, BMI, gender (female; 55.4%), and education (college degree; 57.1%).

Analysis

We use the zero-inflated binomial (ZINB) regression model to simultaneously model the seeking (reading times) and avoidance (excess zeros of articles not chosen) of healthy eating

Figure 1

Screenshot of the Landing Page Highlighting the Two Different Healthy Eating Content-Related Features
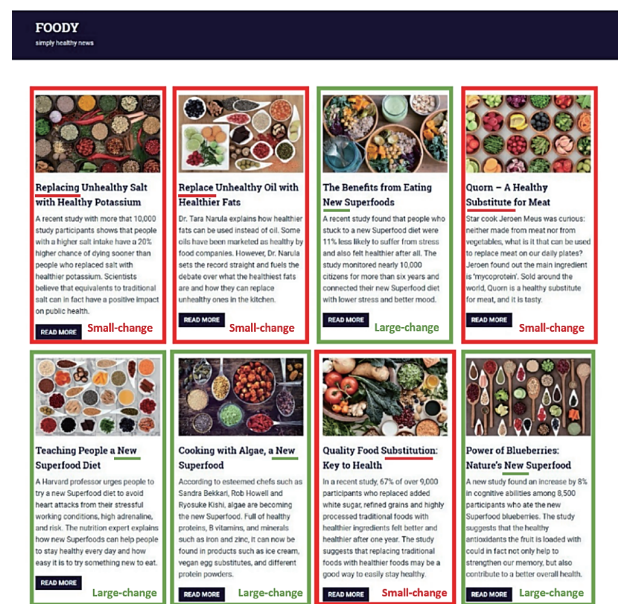
Note: News articles in red represent the small-change (swap) approach, and news articles in green represent the large-change (new) approach. In large-change approach news articles, individuals were encouraged to incorporate and eat new superfoods such as quinoa or pea milk. In small-change approach news articles, individuals were encouraged to replace certain foods, such as white rice with whole-grain rice or pasta with whole-grain pasta. The colored frames are for clarification purposes and were not visible to the individuals who participated in the study.

news. Given the nature of the data, including overdispersion and excess zeros, ZINB models are the most appropriate way to model selective exposure (Scherr & Leiner, 2021). The model simultaneously explains the negative binomial distribution of the selective exposure data using a specific set of predictors and explains the excess zeros capturing information avoidance as part of a logit model with a different set of predictors. Age, gender, education, and BMI were included as control variables in the models.

Results

Zero-order correlations revealed that all variables were moderately correlated (see Table 1).

The ZINB model revealed that neither the negative affect (B = -.469, SE = .607, p = .440) nor the mixed affect (B = .671, SE = .710, p = .345) were associated with the overall healthy eating information seeking (i.e., reading time). Thus, H1a-b

was rejected. Positive affect had a significant but negative effect on information avoidance (B = -.498, SE = .238, p = .032), suggesting that PA is not associated with avoidance of healthy eating news, contrary to our hypothesis. Thus, H2 was also rejected (see Table 2). In addition, ISN was non-significant for information seeking (B =.180, SE = .114, p = .114).

Addressing RQ1, none of the interactions between affects (negative, positive, and mixed) and ISN was significant, regardless of whether it was seeking or avoidance.

Addressing RQ2, none of the affective states, NA (B = .422, SE = .767, p = .583) and MA (B = .132, SE = .887, p = .882) were associated with large-change approach news seeking. However, ISN was found to be significantly and positively associated with the seeking of the large-change approach (B = .287, SE = .129, p = .027), which indicates that when individuals perceive important others expect them to know about healthy eating, the large-change approach seems to be more

Table 1
Zero-Order Correlation between Predictors of Selective Exposure to Healthy Eating News

		1	2	3	4	5	6
1	(RT) Small-Change (Swapping)	—					
2	(RT) Large-Change (New)	-.07	—				
3	Negative Affect	-.08	-.11*	—			
4	Positive Affect	.12*	.07	-.11*	—		
5	Mixed Affect	-.04	-.12*	.92***	.04	—	
6	Informational Subjective Norm	.11*	.01	.10	.12*	.08	—
	M	43.9	42.84	1.92	3.25	1.85	4.16
	SD	61.5	56.42	0.77	0.67	0.66	1.08

Note. N = 359; Pearson correlation with two-tailed significance tests.
RT = Reading time in seconds. Both negative and positive affect were assessed on a 5-point scale ranging from 1 = *strongly disagree* to 5 = *strongly agree*. Mixed affect is defined as *the minimum* score of *positive and negative affect. This variable ranges from 1 to 3.6. Informational subjective norms were assessed on a 7-point scale ranging from 1 = strongly disagree to 7 = strongly agree.*
*$p < .05$, **$p < .01$, ***$p < .001$

Table 2
Zero-Inflated Negative Binomial (ZINB) Regression Model Simultaneously Predicting Exposure and Avoidance of Healthy Eating News

	Overall Exposure			Large Change (New)			Small Change (Swap)		
	B	SE	p	B	SE	p	B	SE	p
Covariates									
Gender (1 = female)	**.18**	**.08**	**.02**	.17	.12	.14	.17	.10	.09
Age	.00	.00	.90	.00	.00	.89	-.00	.00	.67
BMI	.01	.01	.19	-.01	.02	.67	.02	.01	.13
Education (1 = college)	-.01	.08	.88	-.07	.11	.51	-.05	.10	.61
Negative Binomial Model Explaining Exposure to Healthy Eating News Features									
Negative Affect (NA)	-.47	.61	.44	.42	.77	.58	**-2.93**	**.50**	**.00**
Mixed Affect (MA)	.67	.71	.35	.13	.89	.88	**3.03**	**.78**	**.00**
Informational Subjective Norm (ISN)	.18	.11	.11	**.29**	**.13**	**.03**	.11	.14	.42
NA x ISN	.06	.13	.64	-.09	.16	.56	**.46**	**.10**	**.00**
MA x ISN	-.14	.15	.38	.06	.18	.75	**-.49**	**.16**	**.00**
Logit Model Explaining Avoidance of Healthy Eating News Features									
Positive Affect (PA)	**-.50**	**.24**	**.03**	**-.44**	**.21**	**.03**	-.38	.22	.08
PA x ISN	-.01	.03	.73	.02	.03	.41	-.04	.03	.20
Overall Model Parameter									
Log Pseudolikelihood	-1713.22			-1307.71			-1180.27		
Wald χ2 (9)	14.75			12.10			130.46		
p	.098			.208			.000		

Note. N = 359; robust standard errors reported; zero-inflated negative binomial regression model that predicts the information seeking (and avoidance) of the healthy eating small-change and large-change content-related features. Reading times were unobtrusively captured, measured, and reported in seconds. Four articles on the website represented both small-change and large-change content features.
Dummy variables included gender (1 = female, 0 = male) and education (1 = college degree, 0 = no college degree); continuous measures included age (range 18 - 77), informational subjective norms (1 = strongly disagree to 7 = strongly agree), positive affect (1 = strongly disagree to 5 = strongly agree), negative affect (1 = strongly disagree to 5 = strongly agree), and mixed affect ranges from 1 to 3.6; high mixed affect suggests that both positive and negative affect were high.

appealing. Furthermore, PA was significantly but negatively associated with avoiding a large-change approach (B = -.440, SE = .207, p = .034).

Focusing on the small-change approach, NA was negatively associated with seeking this approach (B = -2.932, SE = .502, p = <.001). In contrast, MA was positively associated with seeking the small-change approach (B = 3.025, SE = .779, p = <.001). In other words, an individual with NA will likely spend less time on news featuring a small-change approach. However, individuals with MA are likely to spend more time on news featuring a small-change approach.

Addressing RQ3, none of the interactions between affective states and ISN was associated with seeking or avoiding the large-change approach. However, the interaction between NA (B = .455, SE = .095, p = <.001) and MA (B = -.489, SE = .158, p = .002) with ISN was associated with interest in news featuring a small-change approach. While the interaction between NA and ISN was associated with spending more time on news containing information about small changes, the interaction between MA and ISN was associated with spending less time on such news. Upon further inspection of both interactions, we found that high NA and high ISN were associated with more time spent on a small-change approach than high NA and Low ISN. Furthermore, we also found that high MA and low ISN were associated with more time on small-change news than high MA and high ISN.

Discussion

The findings suggest that the seeking behavior of healthy eating news could neither be explained by the main effects of the affective state (whether negative affect [NA] or mixed affect [MA]), informational subjective norms (ISN), nor by their interactions. However, positive affect (PA) was not associated with avoiding healthy eating news. Focusing on the specific approaches, ISN was the only significant predictor of large-change news seeking. Additionally, individuals with MA spent more time on news featuring a small-change approach than those with NA who spent less time on such news articles. However, when interacting with ISN, these relationships reversed.

Contrary to PRIA predictions (Deline & Kahlor, 2019), PA was not associated with avoidance of healthy eating news; instead, individuals with PA were less likely to avoid such news, especially news featuring a large-change approach. One interpretation is related to social movements such as "body positivity" and "self-love," which aim to foster a more inclusive and compassionate society by promoting self-acceptance and acceptance of all body shape types (Cohen et al., 2019). Some argue that such movements indirectly contributed to the normalization of obesity (Pawar et al., 2020; Robinson, 2017). This is reflected in global web search trends between 2004 and 2019, which show a decline in searches centered on obesity as a disease and a rise in searches related to positive acceptance of body image (Pawar et al., 2020). The implications of the normalization of obesity have been considered an obstacle, hindering the promotion of healthy environments and the discussion of obesity (Muttarak, 2018). However, our findings suggest that health campaigns can leverage the positivity fostered by these movements to increase interest in learning about healthy eating and superfood alternatives, particularly interest in the large-change approach.

Despite the similarities between NA and MA (Bartsch et al.,

2014; Das et al., 2017), our results indicate that MA is associated with more, while NA is associated with less time spent on news featuring a small-change approach. One explanation is that MA - the simultaneous presence of both PA and NA - can lead to more careful information processing as individuals seek to navigate and resolve their uncertainty (see Anderson et al., 2019; Tiedens & Linton, 2001). As for the interest in the small-change approach, an explanation is that NA increases the salience of immediate and concrete goals without consideration for health benefits (Gardner et al., 2014), thus leading to less engagement with the small-change approach, which typically requires more effort to achieve and sustain (Hill, 2009). Conversely, individuals with MA may be drawn to the empowerment offered by this approach (Graham et al., 2022; Hayes et al., 2021).

The interplay between social norms and affective state suggested a reciprocal relationship, wherein emotions can sustain social norms (e.g., comply with social norms to avoid negative emotions and increase personal satisfaction; Keltner & Haidt, 1999), and social norms can regulate emotions by shaping their expression to align with normative expectations (Staller & Petta, 2001; Thoits, 1990). Given that media selectivity is a mechanism to regulate one's affective state (Knobloch-Westerwick, 2006), those experiencing high NA tend to gravitate towards a small-change approach, potentially as a means to terminate or alleviate their NA. Furthermore, high ISN appears to amplify their interest in this approach. While these complex interaction effects require further investigation to fully understand their implications, one practical application could be their integration into the digital intervention efforts. Such efforts encourage individuals to swap their initial food choice (make a small-change) with a healthier alternative using a digital recommendation system (see Jansen et al., 2021). Thus, such digital interventions can explore the possibility of strategically emphasizing ISN about healthy eating to potentially lead to a more permanent dietary change (Hill, 2009).

While this study advances our understanding of the "why" behind the "what" individuals seek in the context of healthy eating news, the complexity of the phenomena requires further attention. Information avoidance was measured by the time not spent on an article (in seconds; Knobloch-Westerwick, 2015). However, information avoidance can also encompass inattention, biased interpretation of information, or forgetting (Golman et al., 2017), which, in turn, is embedded in contextual "cultures of news consumption" (Toff & Kalogeropoulos, 2020). While the news environment provides unprecedented access to a broad range of dietary topics and sources (Lioutas, 2014), individuals tend to acquire information incidentally or through information scanning behavior (Lewis, 2017; Lewis et al., 2022; Ruppel, 2016; Tian & Robinson, 2009). Thus, understanding attention to information is as crucial as understanding information retention - the ability to store and recall information - which is affected by any distractions that divert attention from a specific task (Barrouillet et al., 2004). Therefore, the imposed task of the study, the constant back-and-forth between the landing page and the full articles, and the limited access to various sources and topics (only diet-related news articles included) may have influenced the observed information management behavior.

Limitation
This study enhances our understanding of how affective states

and informational subjective norms jointly influence health-related information seeking and avoidance. Insights from this research can inform the design of more effective health communication strategies and interventions.

Specifically, leveraging informational subjective norms can intensify interest in small dietary changes, particularly among individuals with high negative affect. Future research should address some of the limitations inherent in this study. Given the predominant representation of Belgians in our sample, future studies should include diverse samples to enhance the cross-cultural applicability of our findings. Additionally, to better understand selective exposure behaviors, including a control topic (e.g., sleep or exercise articles) alongside diet-related articles would enhance the findings' generalizability to different news items.

Further, employing experimental designs would enable controlled manipulation variables, such as the self-reported data about the individual's affective state and perceived ISN, which would facilitate the observation of causal relationships. Finaly, despite its overall good reliability and validity (Thompson, 2007), the I-PANAS-SF 's reduced dimensionality, context insensitivity, and the self-reported bias may limit capturing the full complexity of the emotional states (Harley, 2016). Future research could leverage physiological responses associated with emotions, such as heat rate, skin conductance, or brain activity, for objective measurement (Ba & Hu, 2023; Harley, 2016).

Data Availability Statment

The datasets used and/or analyzed during the current study are available from the corresponding author on reasonable request.

Funding Information

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