




ACADEMIC PAPER

The impact of emotions on shopping behavior during epidemic. What a business can do to protect customers

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Abstract

The study investigated how the perception of in-shop COVID-19 contraction influences emotions in decision-making and how they further effect actions undertaken by consumers to control the situation within a store. Structural equation modeling was used to study the relationship between the risk of in-store infection, emotions and in-shop behavior, based on data retrieved from 914 questionnaires. Results showed, that the perceived risk of becoming infected in a store causes an increase in arousal and, at the same time, a decrease in perceived pleasure during shopping. The rise in arousal led to an increase in consumers taking actions to decrease their risk of contagion, while an increase in noticeable pleasure lowered interest of following recommendations for pandemic behavior. The findings imply that through changes regarding in-store atmosphere, stationary shops can provide consumers with a sense of urgency and awareness of infection risk so that they may do their shopping more efficiently.

1 | INTRODUCTION

At the time of writing this article, COVID-19 was declared a global pandemic by the World Health Organization (WHO), with 3,986,119 cases and 278,814 deaths. This prompted governments around the world to encourage their citizens to practice social distancing and undergo quarantine as greatly as possible in order to limit spreading of the disease and exposure (CDC, 2020). Such a time of crisis disrupts normal routines and creates a crisis based on fear (Forster & Tang, 2005). It becomes an epidemic of suspicion - citizens are suspicious of everything and everyone, considering the whole environment a potential source of infection (Strong, 1990). This climate of fear and suspicion was clearly observed in the research by Leung et al. (2004) who surveyed respondents in Hong Kong, China and discovered that 23% considered themselves "very likely" or "somewhat likely" to become infected with SARS when the post-infection rate was only 0.0026%. Exaggerated beliefs such as these cause individuals to undertake behavior changes and/or steer clear of sectors where private consumption involves face-to-face services such as tourism, transportation and leisure, creating vast economic disruptions (Noy &

Shields, 2019). However, a sector that does not appear to be affected by such a crisis is grocery products. As reported by Jung, Park, Hong, and Hyun (2016), who conducted research on how MERS influenced consumer expeditors in Korea, found that the purchase of these items cannot be postponed. As essential as shopping is to consumers, it was also found to be the third most risky setting in which one could acquire pandemic influenza (Sadique et al., 2007). This fear of contagion within supermarkets was found to be true in a report by Nielson (2020a). This author indicated that the spread of COVID-19 prompts consumers to reduce their visits to large supermarkets and become more inclined towards shopping at neighborhood stores where they have little interaction with other consumers, whilst only traveling short distances. The stores at which consumers do their grocery shopping, therefore, must understand the new cautious behaviors of their consumers and cater to them.

The influence of a store's environment and atmosphere on decision-making processes has long been at the center of marketers' interest despite the lack of such research in the context of times of crisis such as a pandemic. At the core of such research is the Pleasure Arousal Dominance (PAD) model (Mehrabian & Russell, 1974). In this

model, it is indicated that environmental stimuli shape behavioral responses as they are the consequences of emotions regarding pleasure (P), arousal (A) and dominance (D). Therefore, the main objective of this article is to understand how the perception of possibly contracting the virus at a store affects feelings of pleasure, arousal in decision-making and the actions undertaken by consumers to reduce these feelings while being at a shop.

The first part of the article is a theoretical review of the effects pleasure and arousal have on decision-making and the role emotions play in risk perception. This is followed by an examination of the research problems and the hypothesis associated with them. The authors then elaborate on the methodology undertaken in this research and the variables that were used to better understand the measured behavioral changes. Following this is a review of the obtained findings and drawn conclusions, in which the authors of this study review business implications, limitations and future research avenues.

2 | THEORETICAL DEVELOPMENT

Studies conducted by a majority of authors provide much evidence that people behave differently when faced with threats, for example, the reason for changes in behavior are emotions associated with evaluating the risks and probabilities of a given phenomenon (Gigerenzer, 2006). As it turns out, people are not so much sensitive to objective probabilistic values as they are to emotions that are the consequence of thinking about a given threat. Moreover, risk assessment of an event is disturbed by the mental availability of an event in the mind of the decision maker (Fischhoff, Gonzalez, Lerner, & Small, 2005). Thus, the decision on whether to undertake a certain action will depend on one's belief that the event will happen to the person, on the emotions associated with that event, as well as on its mental availability in that person's mind.

To the authors' knowledge, this is the first study in which an attempt was made to investigate the impact of COVID-19 on people's shopping behavior. What makes this research innovative is the use of emotion and risk theories, which allow a better understanding of customer motivation to follow recommendations and take precautions to protect themselves against infection during the reign of the virus. In this part, the authors discuss the theories on which the assumptions were built and which were used to derive research hypotheses, as presented on the model framework (Figure 1).

2.1 | Emotional influence on risk perception

People's reaction to risk involves both cognitive appraisals and emotional reactions (Loewenstein, Weber, Hsee, & Welch, 2001). Although cognitive evaluation demands probability and outcome valences, emotions often emerge without conscious deliberation and people may experience negative feelings such as fear without identification of its target (Loewenstein et al., 2001; Zajonc, 1980).

Researchers have found that specific emotions differently influence appraisal tendencies and risk perceptions (Campos-Vazquez & Cuijly, 2014; Lerner & Keltner, 2000, 2001; She, Eimontaite, Zhang, & Sun, 2017). Feelings of anger lead to evaluation of negative events as predictable, being under one's control and to lower risk perception. On the other hand, fear increases perceived risk of outcome; negative events are seen as more unpredictable and under situational control (Lerner & Keltner, 2000). As a consequence, fear enhances risk-averse behaviors while anger enhances risk-seeking actions (Lerner & Keltner, 2001). Campos-Vazquez and Cuijly (2014) demonstrated that sadness leads to risk-aversion in the domain of gains, while Habib, Cassotti, Moutier, Houdé, and Borst (2015) observed similar effects of sadness in the gain frame as well as opposite effects of anger. Contrary to Lerner and Keltner (2001), Habib et al. (2015) demonstrated that

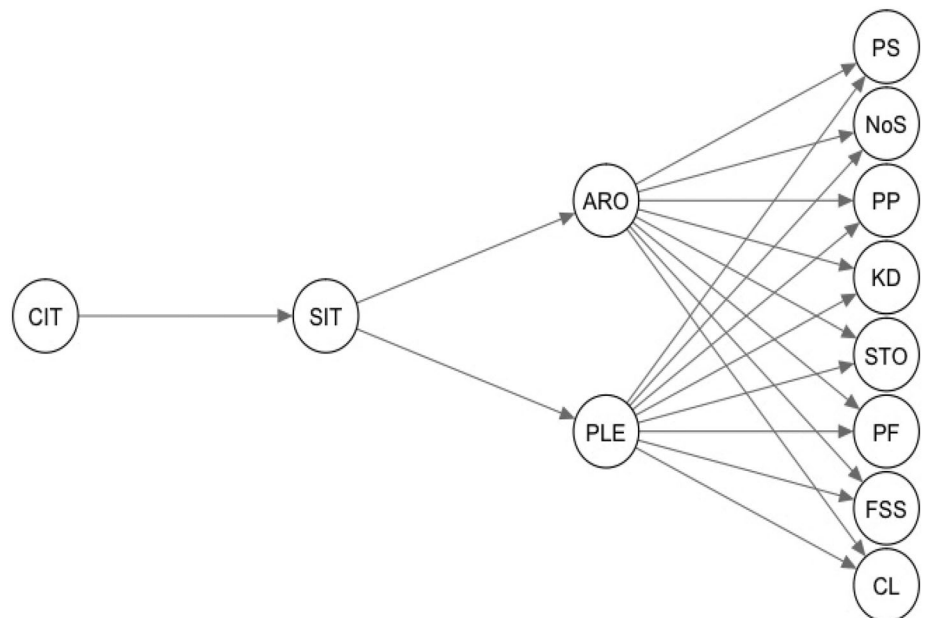


FIGURE 1 Model framework. ARO, arousal; CIT, COVID-19 infection threat; CL, contact limitation; FSS, food supply security; KD, keeping distance; NoS, number of stores; PF, product familiarity; PLE, pleasure; PP, product packaging; PS, personal security; SIT, in-store COVID-19 infection threat; STO, shopping time optimization

emotional influence on risk tendencies is limited to gain frames. However, Lerner and Keltner investigated dispositional fear and anger, while Habib et al. (2015) examined the impact of emotional context on decisions.

According to Lerner and Keltner (2000, 2001; Lerner & Tiedens, 2006), same-valence emotions have different effects on risk behaviors because of different feelings of control (individual agency vs. situational agency) and uncertainty (low vs. high), but not due to different levels of arousal. On the other hand, Wierzbica et al. (2015) observed a weak correlation between discrete categories of emotions and arousal, nonetheless, fear was found to be most strongly correlated with arousal.

In this study, the authors assume that the emotion of fear is crucial in people's perception of becoming infected with COVID-19 and that perceived risk of infection has direct influence on the belief that a person can get infected during shopping. When danger is available in one's mindset, s/he will perceive such an event as more likely to occur (Fischhoff et al., 2005). Moreover, events associated with strong affective consequences (e.g., danger to life) increase probability neglect, thus, leading to overreaction and insensitivity of the actual likelihood of a threat (Slovic & Peters, 2006). Sunstein (2003) claims that when probability neglect appears, people focus their thinking on negative outcomes (Slovic & Peters, 2006). The authors anticipate that belief about the prevailing epidemic affects people's emotions because it is a threat to their health or even lives. Therefore, if someone experiences such a threat, everyday life activities (e.g., shopping) that can lead to infection, are perceived as riskier.

H1 Higher perceived risk of contracting a virus affects the perception of possibly contracting the virus being at a store.

2.2 | Pleasure, arousal and dominance

Due to numerous reports on the significant impact of emotions in Merhabian and Russel's approach to shopping behavior (Coker, 2020; Gorn, Tuan Pham, & Yatming Sin, 2001; Mattila & Wirtz, 2008), the authors decided to apply this theory in order to determine the effect of arousal and pleasure on the perceived risk of contracting COVID-19 at a store. Environmental stimuli shape behavioral responses as they are the consequences of emotional experience regarding pleasure (P), arousal (A) and dominance (D) (Mehrabian & Russell, 1974). Those emotional dimensions elicit approach/avoidance behaviors and influence risk perception. For example, approach behavior involves motivation to enter a shop, interact with salespeople and satisfaction with the environment (Mower, Kim, & Childs, 2012).

According to Mehrabian and Russell (1974), arousal is "an affective property (dimension) ranging from sleep to frantic excitement". Pleasure refers to valence of the affective state that can be positive or negative (Mehrabian, 1996). This results from the belief that a given event can facilitate or hinder one's goal achievements (Vieira, 2013). Dominance is a feeling of control over situations and/or other surroundings versus feelings of being controlled/influenced by a situation and/or other (Mehrabian, 1996; Vieira, 2013). Both pleasure and arousal are the subject of research in the

area of consumer behavior and decision-making, while dominance is often ignored (Bakker, van der Voordt, Vink, & de Boon, 2014). For instance, Jahedi, Deck, and Ariely (2017) suggest that aroused participants are more willing to take risks for gains, while Reich and Zautra (2002) concluded that high stress reduces a person's ability to process information. Kaufman (1999) even claims that extremes in emotional arousal contribute to bounded rationality. Herabadi, Verplanken, and Van Knippenberg (2009) demonstrated that high arousal of positive experiences enhances impulsive buying, which is also confirmed by Liao, To, Wong, Palvia, and Kakhki (2016).

Crucially, arousal is shown to be elicited by fear appeals and to have further consequences on risk perception and behaviors (Lerner & Keltner, 2001; Ruiter, Abraham, & Kok, 2001; Salters-Pedneault, Gentes, & Roemer, 2007). Fear arousal can be defined as "an unpleasant emotional state triggered by the perception of threatening stimuli" (Ruiter et al., 2001). Such a state influences both emotional reactions and motivation to prevent the possible negative outcome of an event and has been illustrated as having influence on health-related behaviors (Myrick & Nabi, 2017; Ruiter, Kessels, Peters, & Kok, 2014). As feelings of threat are demonstrated to increase psychological arousal and information processing (LeDoux, 2000, p. 175; Steimer, 2002), the authors assume that conviction of danger related to contracting the virus increases anticipated arousal associated with shopping.

H2 The perception of possibly contracting the virus at a shop has a positive effect on the feeling of arousal accompanying shopping.

Pleasure is found to influence a vast set of behaviors related to consumer decision-making (Hagtvedt & Patrick, 2008; Kahn & Isen, 1993; Menon & Kahn, 1995; Menon & Kahn, 2002; Schifferstein & Tanudjaja, 2004). Importantly, empirical investigations demonstrate interdependencies between arousal and pleasure. If a person is in a pleasant environment, then stimulation should enhance approach behaviors (Donovan & Rossiter, 1982, p. 39). On the other hand, high arousal in unpleasant conditions should lead to avoidance behaviors. For example, arousal has been shown to increase the impact of pleasure on perceived value and satisfaction (Mattila & Wirtz, 2000). In their other studies, Mattila and Wirtz (2006) observed that an attractive store environment may be seen as unpleasant if it is not consistent with one's desired level of stimulation. Thus, pleasure can moderate the influence of arousal on in-store behaviors (Wirtz, Mattila, & Tan, 2007).

As pleasure is described in terms of positive or negative feelings (Bakker et al., 2014; Mehrabian, 1996), it is rational to assume that availability of danger related to an event will decrease pleasure attributed to such a situation. Notably, scholars have demonstrated that people anticipate pleasure associated with different decision outcomes and that pleasure can be a further decision driver (Mellers & McGraw, 2001). Thus, the authors presume that considering shopping during epidemic is strongly associated with displeasure.

H3 The perception of possible contracting the virus at a store has negative influence on the feeling of pleasure associated with shopping.

Furthermore, it is assumed that there is a strong relationship between both anticipated arousal/pleasantness and willingness to take actions that could reduce the probability of getting infected by COVID-19. The authors of this paper perceive such actions as the possibility of increasing control one could have over the danger of infection. The control over the danger environment is the third component of the PAD emotional model and its importance has been shown with regard to behaviors and health (Bakker et al., 2014; De Lange, Taris, Kompier, Houman, & Bongers, 2003, 2004; Furda et al., 1994; Gaillard, 2003; Johnson & Hall, 1988; Warr, 1994). Although dominance received less attention in consumer research, the authors believe it is rational to include this emotional state in the study. According to Demaree, Everhart, Youngstrom, and Harrison (2005), the dominance emotional state is associated with approach/withdrawal behaviors, thus changes in dominance may elicit different behaviors. Dominance is also the only factor that differentiates fear from anger—two discrete emotions similar in valence and arousal (Mehrabian & O'Reilly, 1980). Moreover, in some studies, dominance is illustrated as having significant influence on in-store behaviors (Foxall, 1997; Foxall & Yani-de-Soriano, 2005; Yani-de-Soriano & Foxall, 2006).

An interesting observation from South Korea, reported by Nielson (2020a), indicated that the spread of COVID-19 is prompting consumers to reduce their visits to large supermarkets, shifting their shopping habits more towards neighborhood stores where they have little interaction with other consumers, whilst only traveling short distances. Another interesting note from this report is that shopping, which is considered a familiar affair in Korea, has now become the responsibility of an adult member of the family to reduce the exposure risk of other family members. Another change in behavior induced by the epidemic is re-assessment of preferences and importance of food attributes. This was observed in the research by Forster and Tang (2005), who noted a spike in the demand for rice, cooking oil, canned goods, consumable foods, frozen foods, cleaning products and toiletries during the SARS crisis in Hong Kong. This demand for items with long shelf-life, such as powdered milk products, dried beans, canned meat, chickpeas, rice, tuna, black beans. Biscuit mix, water and pasta remained applicable during the current COVID-19 epidemic in the U.S., as reported by Nielson (2020b). The same was evident in Canada, where the majority of items in consumer stockpiles consisted of canned, frozen and fresh foods, along with toilet paper and hand sanitizers (Deloitte, 2020). A recent study by Szymkowiak, Kulawik, Jeganathan, and Guzik (2020) adds to the above, produced an eight-factor scale which can be used to measure in-store behavior during times of pandemics. The eight factors include contact limitation, food supply security, consumption of familiar products, optimization of shopping time, in-store social distancing, consumption of products without packaging, number of stores frequented and in-store behavioral changes undertaken to ensure one's personal safety. As discussed above, the emotional state rises to the perception of risk, thus the range of activities undertaken by a consumer in order to maintain control and increase personal safety is conditioned by the intensity of emotion, such as arousal and pleasure while shopping.

Therefore, the following hypotheses referring to behavioral intentions were adopted in the study:

H4a-h In conditions of in store risk infection, along with the increase in arousal, there is an increase in actions undertaken by a consumer to improve control over possible infection: (a) limiting contact with others, (b) limiting the purchase of unpackaged products, (c) maintaining distance in a store, (d) optimization of the time spent in a store, (e) buying familiar products, (f) limiting the number of visited stores, (g) buying products with a long shelf-life, (h) applying additional personal protection.

H5a-h In conditions of in-store risk of infection, along with the increase in shopping pleasure, there is a decrease in actions undertaken by a consumer to improve control over possible infection: (a) limiting contact with others, (b) limiting the purchase of unpackaged products, (c) maintaining distance in store, (d) optimization of the time spent in a store, (e) buying previously known products, (f) limiting the number of visited stores, (g) buying products with long expiration dates, (h) applying additional personal protection.

3 | CURRENT RESEARCH

3.1 | Methods

The study was conducted using a self-administered questionnaire. The questionnaire included statements about perceived risk of COVID-19 infection threat (CIT-3 items), perceived in-store COVID-19 infection threat (SIT-5 items), contact limitation (CL-4 items), food supply security (FSS-4 items), product familiarity (PF-3 items), shopping time optimization (STO-3 items), keeping distance (KD-3 items), product packaging (PP-3 items), number of stores (NoS-3 items) and personal security (PS-3 items), to which respondents were to comment on a scale of 1–7 (1 strongly disagree–7 strongly agree). In addition, on the bipolar scale, respondents were asked to identify their emotions accompanying purchases in relation to arousal (3 items) and pleasure (4 items). The full list of statements is presented in Table 1. Respondents were recruited using Amazon MTurk. In total, 914 completed surveys were collected. The study used two-step validation of responses for people who completed the entire survey. Those included using questions verifying the respondent's attention against the given answers and inverted questions that verified their consistency and, thus, their truthfulness. On this basis, 184 questionnaires were excluded from the trial. The average age among respondents was 40.9 ($SD = 13.08$, min = 18, max = 76). The respondent group was also diverse due to gender, education, income and status (Table 2).

The study was conducted in two stages as proposed by Anderson and Gerbing (1988), to separately analyze validity and reliability of the constructs and test hypotheses based on the adopted research model using structural equation modeling. This allowed to estimate multiple regression equations conceptualized in the model using latent

TABLE 1 Factor statements

Questionnaire, measuring items	
Perceived COVID-19 infection Threat (CIT)	It is very easy to become infected with the COVID-19 virus
	There is a high risk of contracting COVID-19
	COVID-19 is easily transmittable
Perceived in-store infection threat (SIT)	One can become infected with COVID-19 at the grocery store
	Shopping during the COVID-19 epidemic is a risk to health
	There is a risk of infection with the COVID-19 virus while at the store
	When shopping, one is at risk of becoming infected with COVID-19
	There is a fear of becoming infected with the COVID-19 virus while shopping
Contact limitation (CL)	Doing shopping without accompanying people
	Limiting the number of household residents who do shopping
	Purchasing from a store that in which there are few customers at a time
	Doing shopping at times of low shopper traffic
Food supply security (FSS)	Purchasing preserved food products
	Purchasing frozen food products
	Purchasing food products with long expiration dates
	Stocking up on food items
Product familiarity (PF)	Purchasing already known food products
	Purchasing trusted food brands
	Choosing familiar products
Shopping time	Limiting time spent in store
Optimization (STO)	Moving smoothly without stopping others
	Shopping quickly
Keeping distance (KD)	Keeping a distance waiting in line
	Waiting at a distance while someone else is choosing products
	Maintaining a distance while waiting in line
Number of stores (NoS)	Using one grocery store for purchases
	Conducting shopping at one store
	Limiting the number of stores visited
Personal security (PS)	Disinfecting handles after touching for example, freezer doors
	Bringing hand disinfecting agent during shopping
	Using contactless payment
Product packaging (PP)	Refraining from purchasing food without packaging

TABLE 1 (Continued)

Questionnaire, measuring items	
	Refraining from purchasing unpacked, ready-to-eat foods
	Limiting the purchase of unpackaged vegetables
Pleasure (PLE)	Unhappy-happy
	Annoyed-pleased
	Melancholic-contented
Arousal (ARO)	Calm-excited
	Sluggish-frenzied
	Dull-jittery
	Sleepy-wide-awake

variables (Hair, Black, Babin, & Anderson, 2014). The R programming environment and Lavaan, Psych package were used in the analysis. All analyzes were performed with the use of bootstrapping to improve reliability of the results.

4 | RESULTS

Confirmatory analysis was carried out in order to assess the reliability and validity of the measurement model (Table 3). CFA results indicate compliance with the recommended values. ($\chi^2 = 1,854.75$; CFI = 0.95; TLI = 0.95; GFI = 0.89; IFI = 0.95; $\chi^2/df = 2.59$; $p < .00$, and RMSEA = 0.047). All factors loading items were above 0.69 which exceeds the recommended 0.6 (Chin, Gopal, & Salisbury, 1997). Further, to measure scale reliability, Cronbach's α was applied. The values of Cronbach's α ranged from 0.76 to 0.94, representing good and very good consistency as recommended by Hair et al. (2014). For measuring convergent and discriminant validity, in addition to standardized factor loading, two parameters were used, that is, Composite Reliability (CR) and Average Variance Extracted (AVE). The AVE values were between 0.52–0.82, totaling 0.68, which is above the acceptable limit of 0.5 as recommended by Hair et al. (2014). The CR values also exceeded the acceptable limit of 0.6, with values ranging from 0.77 to 0.94 and equaling 0.96, which indicates internal consistency of multiple indicators (Bagozzi & Yi, 1988). The square root of the AVE was also higher than the correlation between each construct, indicating good adequacy (Table 4). Based on the above results, it can be assumed that the proposed conceptual model has good validity, both convergent and discriminant, as well as reliability.

Empirical analysis based on the adopted theoretical model revealed a good fit. Using bootstrapping (5,000 samples), the model demonstrated a good fit ($\chi^2 = 1,991.43$; CFI = 0.95; TLI = 0.94; GFI = 0.88; IFI = 0.95; $\chi^2/df = 2.72$; $p < .00$, and RMSEA = 0.049) and it may be used to assess the impact of emotions resulting from the perceived threat of becoming infected by COVID-19 on in-store behavior.

Based on the study, analysis of the effects between factors was performed. There is a high positive relationship between perceived

TABLE 2 Description of the study group

Gender			
Variable	Counts	% of total	Cumulative %
Female	434	59.5%	59.5%
Male	288	39.5%	99.0%
Prefer not to say	7	1.0%	100.0%
Education level			
Variable	Counts	% of total	Cumulative %
Bachelor's degree	339	46.5%	46.5%
Doctorate	18	2.5%	49.0%
High school degree or equivalent	213	29.2%	78.2%
Less than a high school diploma	3	0.4%	78.6%
Master's degree	127	17.4%	96.0%
Other	29	4.0%	100.0%
Annual income			
Variable	Counts	% of total	Cumulative %
\$20,000–\$29,999	95	13.0%	13.0%
\$30,000–\$39,999	85	11.7%	24.7%
\$40,000–\$49,999	72	9.9%	34.6%
\$50,000–\$59,999	85	11.7%	46.2%
\$60,000–\$69,999	55	7.5%	53.8%
\$70,000–\$79,999	55	7.5%	61.3%
\$80,000–\$89,999	35	4.8%	66.1%
\$90,000≥	127	17.4%	83.5%
≤\$19,999	120	16.5%	100.0%
Status			
Variable	Counts	% of total	Cumulative %
Employed full-time	377	51.7%	51.7%
Employed part-time	114	15.6%	67.4%
Retired	49	6.7%	74.1%
Self-employed	73	10.0%	84.1%
Student	33	4.5%	88.6%
Unable to work	20	2.7%	91.4%
Unemployed	63	8.6%	100.0%

general possibility of becoming infected with the virus and the perceived possibility of becoming infected with the virus at a store ($\beta = .83, p < .001$). Thus, the H1 hypothesis was confirmed. The perceived risk of becoming infected in a store causes an increase in arousal ($\beta = .38, p < .001$) and at the same time, a decrease in perceived pleasure while being at the store ($\beta = -.44, p < .001$), which confirms hypotheses H2 and H3, respectively. Research has revealed the impact of feelings on in-store behavior. The arousal increase affects CL ($\beta = .17, p < .05$), STO ($\beta = .17, p < .01$), PS ($\beta = .16, p < .05$), KD ($\beta = .17, p < .05$) and NoS ($\beta = .19, p < .01$). No other

statistically significant relationships were found for stimulation, which only confirms hypotheses H4a, H4c, H4d, H4f and H4h. In the case of noticeable pleasure, significant negative impact was noted on all dimensions of shopping behavior, increasing control over the threat. Standardized regression coefficient values were $\beta = -.11, p < .05$ for PF and from $\beta = -.40$ to $\beta = -.25$ at the level of $p < .001$ for the remaining variables. A detailed description of the values is shown in Table 5.

5 | FINDINGS AND DISCUSSION

This study concerned the effects of COVID-19 on emotional arousal, pleasantness and subjective risk related to infection within context of the in-store behavior. To the authors' knowledge, this is the first investigation of how risk perception of becoming infected with the coronavirus influences emotional responses associated with shopping considerations. Of special interest was whether emotional arousal and pleasantness cause an increase or decrease in willingness to follow recommendations and take protective precautions against infection. It was expected that the overall risk of contracting the virus translates into greater confidence in the possibility of contracting the virus while shopping. The authors assumed that typical daily activity such as shopping does not elicit any negative states, but when the threat of an epidemic is present in the mind of a decision maker, shopping is associated with an increase in arousal with a simultaneous decrease in pleasantness. This has further consequences on people's tendencies to be careful and protect themselves from contagion.

In order to assess the emotional consequences of COVID-19 on shopping behaviors, the PAD emotional model was used. The rationale for choosing this construct relates to the assumption that all negative emotions are not identical (Raghunathan & Pham, 1999). The authors specifically followed the suggestion that the emotion of fear characterizes high arousal, displeasure and low dominance (Lerner & Keltner, 2000). Moreover, as the epidemiological threat is beyond the control of both stores and buyers, the only way to limit its negative effects is to take precautions. Thus, the participants of this study reported behavioral intentions to undertake actions increasing their personal control over the virus.

5.1 | Emotional influence on risk perception

A positive correlation has been demonstrated between general possibility of infection with the virus and the perceived possibility of becoming infected at a store (H1). This finding is not surprising as dramatic events involving feelings of threat affect risk judgments (Gigerenzer, 2006). A potential explanation may be related to availability heuristic, that is the belief that things that have happened recently are more likely to occur in the near future (Folkes, 1988; Schwarz et al., 1991; Schwarz & Vaughn, 2002). For example, Fischhoff et al. (2005) observed an increase in the perceived risk of a terrorist attack among those whose attack experience has more

Latent factor	Item	Factor loading	Sig.	Cronbach's α	C.R.	AVE
CIT	CIT1	0.90	***	0.92	0.92	0.8
	CIT2	0.91	***			
	CIT3	0.88	***			
SIT	SIT1	0.81	***	0.94	0.94	0.76
	SIT2	0.90	***			
	SIT3	0.93	***			
	SIT4	0.92	***			
	SIT5	0.80	***			
PLE	PLE1	0.90	***	0.85	0.85	0.65
	PLE2	0.79	***			
	PLE3	0.72	***			
ARO	ARO1	0.74	***	0.8	0.8	0.51
	ARO2	0.71	***			
	ARO3	0.70	***			
	ARO4	0.70	***			
CL	CL4	0.82	***	0.88	0.87	0.64
	CL1	0.80	***			
	CL2	0.79	***			
	CL3	0.80	***			
FSS	FSS1	0.78	***	0.86	0.87	0.62
	FSS2	0.82	***			
	FSS3	0.87	***			
	FSS4	0.69	***			
PF	PF1	0.92	***	0.93	0.93	0.82
	PF2	0.91	***			
	PF3	0.89	***			
STO	STO1	0.90	***	0.89	0.89	0.72
	STO2	0.81	***			
	STO3	0.83	***			
KD	KD1	0.95	***	0.94	0.94	0.84
	KD2	0.89	***			
	KD3	0.91	***			
PP	PP1	0.90	***	0.91	0.91	0.77
	PP2	0.88	***			
	PP3	0.85	***			
NoS	NoS1	0.75	***	0.9	0.78	0.65
	NoS2	0.80	***			
	NoS3	0.87	***			
PS	PS1	0.75	***	0.76	0.77	0.52
	PS2	0.73	***			
	PS3	0.69	***			
Total				0.93	0.96	0.68

TABLE 3 Confirmatory factor analysis

Abbreviations: AVE, average variance extracted; CR, composite reliability.

availability in their minds. A similar conclusion was obtained by Larsen, Brun, øgaard, and Selstad (2011), who noted that recent terrorist attacks influence risk assessments and reduce willingness of travel to

destinations where an attack had already occurred. Other research seems to support that claim (Brun, Wolff, & Larsen, 2011; Fuchs, Uriely, Reichel, & Maoz, 2013; Gray & Wilson, 2009).

TABLE 4 Correlations between the constructs

	CIT	SIT	PLE	ARO	CL	FSS	PF	STO	KD	PP	NoS	PS
CIT	0.89											
SIT	0.83	0.87										
PLE	-0.37	-0.40	0.81									
ARO	0.28	0.35	-0.43	0.71								
CL	0.54	0.60	-0.36	0.26	0.80							
FSS	0.40	0.41	-0.30	0.19	0.50	0.79						
PF	0.22	0.21	-0.09	0.00	0.25	0.53	0.91					
STO	0.49	0.57	-0.43	0.29	0.81	0.53	0.36	0.85				
KD	0.47	0.52	-0.33	0.25	0.75	0.41	0.20	0.84	0.92			
PP	0.32	0.33	-0.26	0.13	0.40	0.61	0.41	0.38	0.28	0.88		
NoS	0.36	0.42	-0.25	0.20	0.52	0.53	0.36	0.52	0.37	0.57	0.88	
PS	0.41	0.49	-0.28	0.22	0.71	0.50	0.31	0.66	0.63	0.52	0.56	0.73

Note: Values in bold represent the square root of AVE.

TABLE 5 Between-factor effect

Hypothesis	Factor	Factor	Sig	Beta	
H1	CIT	→ SIT	***	.83	Approved
H2	SIT	→ ARO	***	.38	Approved
H3	SIT	→ PLE	***	-.44	Approved
H4a	ARO	→ CL	*	.17	Approved
H5a	PLE	→ CL	***	-.34	Approved
H4b	ARO	→ STO	**	.17	Approved
H5b	PLE	→ STO	***	-.40	Approved
H4c	ARO	→ FSS		.10	Rejected
H5c	PLE	→ FSS	***	-.28	Approved
H4d	ARO	→ PP		.04	Rejected
H5d	PLE	→ PP	***	-.26	Approved
H4e	ARO	→ PF		-.03	Rejected
H5e	PLE	→ PF	*	-.11	Approved
H4f	ARO	→ PS	*	.16	Approved
H5f	PLE	→ PS	***	-.25	Approved
H4g	ARO	→ KD	*	.17	Approved
H5g	PLE	→ KD	***	-.30	Approved
H4h	ARO	→ NoS	**	.19	Approved
H5h	PLE	→ NoS	***	-.26	Approved

The authors' research provides initial evidence that having one's life threatened due to COVID-19, influences risk judgments related to a specific element of an individual's daily routine—shopping. However, two issues should be raised here. First, it has been suggested that an explanation for this observation is mental availability of COVID-19 infection in the minds of decision-makers. But questions were not asked regarding ease of recall or ease of imagining being infected. In this paper, it was assumed that information about the dominance of the virus is widespread, and continuous mass media communication contribute to the presence of such content in the minds of decision-

makers. It is difficult to imagine that any of the study participants were not aware of the epidemic, especially since the questionnaire was conducted online and, therefore, participants had direct connection to the Internet and most recent news events. On the other hand, it should be clearly stated that the sense of danger and the ease with which content come to mind (Tversky & Kahneman, 1973) can be different among various people. Thus, vividness of imagining viral infection could mediate the relationship between overall possibility of infection and infection at the store (Shedler & Manis, 1986).

Secondly, literature is rich in examples of how negative emotions (e.g., fear or anger) influence risk perceptions (Lerner & Keltner, 2001; Loewenstein et al., 2001). There is no doubt that the possibility of catching the virus is a source of negative emotions, which then affects the perceived risk of contracting infection at a store. However, there is also the possibility that risk of infection could be higher due to feelings of fear not related to the COVID-19 threat itself. Thus, an individual dramatic event that causes negative feelings (e.g., job loss) may have similar consequences for risk perception as the prevailing virus (Fessler, Pillsworth & Flamson, 2004).

5.2 | Pleasure, arousal and dominance

Since contracting COVID-19 is associated with limiting one's success in achieving goals, while posing a threat to one's life, cognitive appraisal of such an event leads to the emergence of negative feelings (Folkman & Lazarus, 1984). Thus, it is not surprising that participants associate shopping during a pandemic with displeasure (H3). Moreover, it has been demonstrated that shopping during a pandemic is associated with increased emotional arousal (H2). This finding is in line with psychological literature in which it is suggested that the emotion of fear is connected with increased arousal, displeasure and lack of control (Lerner & Keltner, 2000; Reisenzein, 1994). However, the main objective of this paper is related to determining the consequences of arousal and (dis)pleasure on willingness to apply security

practices that everyone may undertake to limit the possibility of COVID-19 infection at a store. Thus, in this section, the main focus is on discussion related to the influence of arousal and (dis)pleasure evoked by COVID-19 on in-store behaviors.

5.2.1 | Arousal

It has been discovered that respondents who perceived themselves at risk of contagion and experiencing an increase in arousal opted to limit contact with others (H4a), maintain distance (H4c), optimize the time in which they were present at the store (H4d), limit the number of shops that were visited (H4f) and undertook additional steps to ensure their safety (H4h). However, these respondents did not show any preferences towards limiting the purchase of unpackaged products (H4b), but purchased only products that they were familiar with (H4e) and those that had a long shelf-life (H4g). Thus, it was confirmed that arousal related to infection translates into higher willingness to protect oneself. In other words, fear-aroused people seek possibilities to reduce the threat of infection and are risk-averse. Other studies, however, provide mixed and inconsistent support for these observations (Jahedi et al., 2017). For example, Savitsky, Medvec, Charlton, and Gilovich (1998) demonstrated that pessimism is associated with an increase in arousal, which is in line with the findings of this study. Thus, participants would be more willing to use protection as they anticipate negative outcomes of going to a store. Feldman-Hall, Glimcher, Baker, and Phelps (2016) claim that high arousal is correlated with safe-option preferences, but only when the risk is high and the chance of winning low. Schmidt, Mussel, and Hewig (2013) indicated that lower resting arousal decreases risk perception while enhancing risk-seeking. They argue that low-aroused people seek stimulation which is the reason for risk preferences.

Contrary to the authors' findings, in some studies, it has been indicated that high arousal enhances risk-seeking. According to Knutson, Wimmer, Kuhnen, and Winkielman (2008), high arousal seems to enhance preferences for risky options. Rydell et al. (2008) claim that arousal enhances the preference for risk-seeking but only when it is linked to anger and not fear. Similar conclusions were drawn by Lerner and Keltner (2001), suggesting that dispositional fear enhances choosing risk-averse options, while anger enhances the preference for risk-seeking. Crucially, arousal is shown to have varying influence on risk-taking tendencies due to its valence (positive vs. negative) (Galentino, Bonini, & Savadori, 2017).

Therefore, the results of this study broaden up-to-date knowledge regarding the effects of arousal on risk-related behaviors. Although this stream of research provides mixed results, it is clear that the effect of emotional arousal on risky behaviors depends on valence (positive vs. negative) and control (individual vs. situational) over an event. In the authors' research, arousal is associated with negative outcomes and lack of individual control, thus enhancing risk-averse behaviors related to increased willingness to protect oneself.

5.2.2 | Pleasure

Visiting a physical store for shopping as per Roy Dholakia (1999) is a major source of relaxation as well as a household chore. Thus, it is reasonable to expect that higher pleasure associated with shopping increases willingness to go to a store. However, would that pleasure translate into preference for undertaking actions increasing personal control over the virus? It was expected that pleasure (vs. displeasure) decreases willingness to protect oneself, and this assumption is supported by the analysis of respondents for whom a notable increase in pleasure was indicated during shopping while under the threat of contagion, showing little interest in asserting dominance and protecting oneself by limiting contact with others (H4a), maintaining distance (H4c), optimizing the time spent at a store (H4d), limiting the number of visited shops (H4f), undertaking additional steps to ensure protection (H4h) and limiting the purchase of products that were unpackaged (H4b), familiar (H4e) or having a long shelf-life (H4g). Such findings are rather troubling as the hedonic principle of behavior states that people approach pleasure and avoid pain (Higgins, 2006). Higgins (1998) reiterates this, citing the hedonic principle as a lawful description of orderly event patterns and states that when situated behavior produces pleasure, there is a very high possibility of it being repeated.

5.2.3 | Dominance

Fear in an individual is associated with uncertainty and low situational control (Smith & Ellsworth, 1985). Adding to this statement, Lerner and Keltner (2000) connects this with low certainty, high anticipated effort, low control and medium responsibility. Therefore, any attempt at dominance over a uncontrollable situation is more likely to be ignited by the presence of fear rather than its absence. This was clearly observed in the case of the present study, as the respondents who perceived themselves under risk of contagion and experience an increase in arousal, opted to assert dominance over their personal security by limiting contact with others, maintaining distance, optimizing the time in which they were present at a store and limiting the number of shops visited by them. This is in line with the findings of Lerner and Keltner (2000), who in their research on anger, fear and decision-making, discovered that fear causes individuals to become averse to risk, in contrast to anger. Reiterating this, Habib et al. (2015) stated that fear increases risk aversive decision-making among individuals. Such behavior, as per Fessler, Pillsworth, and Flanson (2004), is the functional objective of fear which is to reduce any harm that may occur to an individual experiencing it.

6 | CONCLUSIONS

This is the first study in which it was measured how environmental stimulus such as fear of contagion by a pandemic shapes consumer behavioral response within a store. The findings affirm those obtained

in previous studies as a high positive relationship was discovered between the perceived general possibility of becoming infected with the virus and the perceived possibility of becoming infected with the virus at a store. This perceived threat of becoming infected was then found to have caused an increase in arousal and a decrease in perceived pleasure while being at a store. The feeling of (dis)pleasure affects all areas of control/dominance, while arousal affects the majority, but not all. The respondents who showed an increase of noticeable pleasure during shopping while under the threat of contagion, appear to be less interested in protecting themselves.

The authors expect the findings of this research to have wide ranging repercussions on how stationary shops should prepare themselves for unprecedented events such as an epidemic, where the threat of contagion is ever-present. Based on this study, stationary shops cannot function on the premise of business as usual during a pandemic and are now faced with a conundrum. It has further been discovered that a sense of pleasure one obtains during shopping leads to a decrease in behavior allowing to protect oneself against contagion and obey WHO recommendations. Such a sense of security, when combined with existing in-store atmospheric boosting activities such as music, ambient lighting and temperature control, can be expected to urge the consumer to stay longer, consuming more and creating an atmosphere that is very conducive for the spread of contagion. Such an environment poses a very serious threat to society as urbanization is at an all-time high, with many depending on supermarkets for their food supply. However, the achieved conclusions apply to all types of stores where virus transmission is possible. The question that begs answering then is, what can such stationary stores do differently? The authors believe that the answer to this is not complete alleviation of in-store atmosphere-related conditions, but a change in them so as to provide consumers with a sense of urgency and awareness of infection risk so that they may go about their shopping in a more efficient manner, instead of doing everything to make the customer feel good in a store.

This study, as can be expected, does have certain limitations. One such limitation is that the questionnaire was released during the outbreak of the COVID-19 pandemic, restricting the possibility of comparing the results for in-shop behavior with a time from before the epidemic. One must also bear in mind that certain behaviors such as the preference for social distancing and donning of protective wear during shopping could be a result of government mandated rules that were implemented to prevent the spread of COVID-19. It was also interesting to discover that the respondents did not show a preference towards purchasing only products that they were familiar with and those that had a long shelf-life, despite widespread reports related to stockpiling of goods. The cause behind this finding it believed to be that the quarantine measures had already been in force for an extended period of time prior to the release of the study questionnaire, with the aforementioned stockpiling behavior occurring only as the quarantine measures were introduced. It is also important to note that the research sample was based solely in the U.S., the findings being an indication of the in-store behavioral changes of consumers within this environment. This limitation, however, can be used

as a premise for further research including respondents from other nations. The authors also believe that is the scope of this research may be extended to workplaces, banks and services such as hair-dressers in order to obtain a better understanding of how individuals perceive the risk of contagion in a variety of settings and undertake steps helping them assert dominance.

CONFLICT OF INTEREST

The authors declare no conflicts of interest.

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REFERENCES

- Anderson, J., & Gerbing, D. (1988). Structural equation Modeling in practice: A review and recommended two-step approach. *Psychological Bulletin*, 103, 411–423. Retrieved from <https://doi.org/10.1037/0033-2909.103.3.411>
- Bagozzi, R., & Yi, Y. (1988). On the evaluation of structural equation models. *Journal of the Academy of Marketing Science*, 16(1), 74–94. <https://doi.org/10.1007/BF02723327>
- Bakker, I., van der Voordt, T., Vink, P., & de Boon, J. (2014). Pleasure, arousal, dominance: Mehrabian and Russell revisited. *Current Psychology*, 33(3), 405–421.
- Brun, W., Wolff, K., & Larsen, S. (2011). Tourist worries after terrorist attacks: Report from a field experiment. *Scandinavian Journal of Hospitality and Tourism*, 11(3), 387–394. <https://doi.org/10.1080/15022250.2011.593365>
- Campos-Vazquez, R. M., & Cuijly, E. (2014). The role of emotions on risk aversion: A prospect theory experiment. *Journal of Behavioral and Experimental Economics*, 50, 1–9. <https://doi.org/10.1016/j.socec.2014.01.001>
- CDC. (2020). How COVID-19 spreads. Retrieved from <https://www.cdc.gov/coronavirus/2019-ncov/prevent-getting-sick/how-covid-spreads.html>
- Chin, W. W., Gopal, A., & Salisbury, W. D. (1997). Advancing the theory of adaptive structuration: The development of a scale to measure faithfulness of appropriation. *Information Systems Research*, 8(4), 342–367. <https://doi.org/10.1287/isre.8.4.342>
- Coker, B. (2020). Arousal enhances herding tendencies when decision making. *Journal of Consumer Behaviour*, 19(3), 229–239. <https://doi.org/10.1002/cb.1811>
- De Lange, A. H., Taris, T. W., Kompier, M. A., Houtman, I. L., & Bongers, P. M. (2004). The relationships between work characteristics and mental health: Examining normal, reversed and reciprocal relationships in a 4-year study. *Work & Stress*, 18(2), 149–166.
- De Lange, A. H., Taris, T. W., Kompier, M. A. J., Houman, I. L. D., & Bongers, P. M. (2003). The very best of the millennium': Longitudinal research and the demand-control-(support) model. *Journal of Occupational Health Psychology*, 8, 282–305.
- Deloitte. (2020). COVID-19: Voice of Canadians and impact to retailers.
- Demaree, H. A., Everhart, D. E., Youngstrom, E. A., & Harrison, D. W. (2005). Brain lateralization of emotional processing: Historical roots and a future incorporating "dominance". *Behavioral and Cognitive Neuroscience Reviews*, 4(1), 3–20. <https://doi.org/10.1177/1534582305276837>
- Donovan, R., & Rossiter, J. (1982). Store atmosphere: An environmental psychology approach. *Journal of Retailing*, 58(1), 34–57.

- Feldman-Hall, O., Glimcher, P., Baker, A. L., & Phelps, E. A. (2016). Emotion and decision-making under uncertainty: Physiological arousal predicts increased gambling during ambiguity but not risk. *Journal of Experimental Psychology: General*, 145(10), 1255–1262.
- Fessler, D. M. T., Pillsworth, E. G., & Flanson, T. J. (2004). Angry men and disgusted women: An evolutionary approach to the influence of emotions on risk taking. *Organizational Behavior and Human Decision Processes*, 95(1), 107–123. <https://doi.org/10.1016/j.obhdp.2004.06.006>
- Fischhoff, B., Gonzalez, R. M., Lerner, J. S., & Small, D. A. (2005). Evolving judgments of terror risks: Foresight, hindsight, and emotion. *Journal of Experimental Psychology: Applied*, 11(2), 124–139.
- Folkes, V. S. (1988). The availability heuristic and perceived risk. *Journal of Consumer Research*, 15(1), 13–23.
- Folkman, S., & Lazarus, R. S. (1984). *Stress, appraisal, and coping* (pp. 150–153). New York, NY: Springer Publishing Company.
- Forster, P., & Tang, Y. (2005). The role of online shopping and fulfillment in the Hong Kong SARS crisis.
- Foxall, G. R., & Yani-de-Soriano, M. M. (2005). Situational influences on consumers' attitudes and behavior. *Journal of Business Research*, 58(4), 518–525. [https://doi.org/10.1016/S0148-2963\(03\)00142-5](https://doi.org/10.1016/S0148-2963(03)00142-5)
- Fuchs, G., Uriely, N., Reichel, A., & Maoz, D. (2013). Vacationing in a terror-stricken destination: Tourists' risk perceptions and rationalizations. *Journal of Travel Research*, 52(2), 182–191. <https://doi.org/10.1177/0047287512458833>
- Foxall, G. R. (1997). The emotional texture of consumer environments: A systematic approach to atmospherics. *Journal of Economic Psychology*, 18(5), 505–523.
- Furda, J., de Jonge, J., le Blanc, P., Meijman, T., Scheurs, P., & Scheenen, J. (1994). Het demand-control-support model in relatie tot gezondheidsklachten en herstelklachten. *Gedrag en Organisatie*, 7, 225–237.
- Gaillard, A. W. K. (2003). *Stress, productiviteit en gezondheid* (2nd ed.). Amsterdam: Uitgeverij Nieuwezijds.
- Galentino, A., Bonini, N., & Savadori, L. (2017). Positive arousal increases individuals' preferences for risk. *Frontiers in Psychology*, 8, 1–9. <https://doi.org/10.3389/fpsyg.2017.02142>
- Gigerenzer, G. (2006). Out of the frying pan into the fire: Behavioral reactions to terrorist attacks. *Risk Analysis: An International Journal*, 26(2), 347–351.
- Gorn, G., Tuan Pham, M., & Yatming Sin, L. (2001). When arousal influences ad evaluation and valence does not (and vice versa). *Journal of Consumer Psychology*, 11(1), 43–55. https://doi.org/10.1207/S15327663JCP1101_4
- Gray, J. M., & Wilson, M. A. (2009). The relative risk perception of travel hazards. *Environment and Behavior*, 41(2), 185–204. <https://doi.org/10.1177/0013916507311898>
- Habib, M., Cassotti, M., Moutier, S., Houdé, O., & Borst, G. (2015). Fear and anger have opposite effects on risk seeking in the gain frame. *Frontiers in Psychology*, 6, 253–260. <https://doi.org/10.3389/fpsyg.2015.00253>
- Hagtvedt, H., & Patrick, V. M. (2008). Art infusion: The influence of visual art on the perception and evaluation of consumer products. *Journal of Marketing Research*, 45(3), 379–389. <https://doi.org/10.1509/jmkr.45.3.379>
- Hair, J., Black, W., Babin, B., & Anderson, R. (2014). *Multivariate data analysis* (7th ed.). Essex: Pearson Education Limited.
- Herabadi, A. G., Verplanken, B., & Van Knippenberg, A. (2009). Consumption experience of impulse buying in Indonesia: Emotional arousal and hedonistic considerations. *Asian Journal of Social Psychology*, 12(1), 20–31. <https://doi.org/10.1111/j.1467-839X.2008.01266.x>
- Higgins, E. (1998). Beyond pleasure and pain. *The American Psychologist*, 52, 1280–1300. <https://doi.org/10.1037//0003-066X.52.12.1280>
- Higgins, E. T. (2006). Value from hedonic experience and engagement. *Psychological Review*, 113(3), 439–460.
- Jahedi, S., Deck, C., & Ariely, D. (2017). Arousal and economic decision making. *Journal of Economic Behavior & Organization*, 134, 165–189.
- Johnson, J. V., & Hall, E. M. (1988). Job strain, workplace social support, and cardiovascular disease: A cross sectional study of a random sample of the Swedish working population. *American Journal of Public Health*, 78, 1336–1342.
- Jung, H., Park, M., Hong, K., & Hyun, E. (2016). The impact of an epidemic outbreak on consumer expenditures: An empirical assessment for MERS Korea. *Sustainability*, 8(5), 454. <https://doi.org/10.3390/su8050454>
- Kahn, B. E., & Isen, A. M. (1993). The influence of positive affect on variety seeking among safe, enjoyable products. *Journal of Consumer Research*, 20(2), 257–270. <https://doi.org/10.1086/209347>
- Kaufman, B. E. (1999). Emotional arousal as a source of bounded rationality. *Journal of Economic Behavior & Organization*, 38(2), 135–144. [https://doi.org/10.1016/S0167-2681\(99\)00002-5](https://doi.org/10.1016/S0167-2681(99)00002-5)
- Knutson, B., Wimmer, G. E., Kuhnen, C. M., & Winkielman, P. (2008). Nucleus accumbens activation mediates the influence of reward cues on financial risk taking. *Neuroreport*, 19(5), 509–513.
- Larsen, S., Brun, W., øgaard, T., & Selstad, L. (2011). Effects of sudden and dramatic events on travel desire and risk judgments. *Scandinavian Journal of Hospitality and Tourism*, 11(3), 268–285. <https://doi.org/10.1080/15022250.2011.593360>
- LeDoux, J. E. (2000). Emotion circuits in the brain. *Annual Review of Neuroscience*, 23(1), 155–184. <https://doi.org/10.1146/annurev.neuro.23.1.155>
- Lerner, J. S., & Keltner, D. (2000). Beyond valence: Toward a model of emotion-specific influences on judgement and choice. *Cognition and Emotion*, 14(4), 473–493. <https://doi.org/10.1080/026999300402763>
- Lerner, J. S., & Keltner, D. (2001). Fear, anger, and risk. *Journal of Personality and Social Psychology*, 81(1), 146–159. <https://doi.org/10.1037/0022-3514.81.1.146>
- Lerner, J. S., & Tiedens, L. Z. (2006). Portrait of the angry decision maker: How appraisal tendencies shape anger's influence on cognition. *Journal of Behavioral Decision Making*, 19(2), 115–137. <https://doi.org/10.1002/bdm.515>
- Leung, G., Quah, S., Ho, L.-M., Ho, S.-Y., Hedley, A., Lee, H.-P., & Lam, T.-H. (2004). A tale of two cities: Community Psychobehavioral surveillance and related impact on outbreak control in Hong Kong and Singapore during the severe acute respiratory syndrome epidemic. *Infection Control and Hospital Epidemiology: The Official Journal of the Society of Hospital Epidemiologists of America*, 25, 1033–1041. <https://doi.org/10.1086/502340>
- Liao, C., To, P. L., Wong, Y. C., Palvia, P., & Kakhki, M. D. (2016). The impact of presentation mode and product type on online impulse buying decisions. *Journal of Electronic Commerce Research*, 17(2), 153–168.
- Loewenstein, G. F., Weber, E. U., Hsee, C. K., & Welch, N. (2001). Risk as feelings. *Psychological Bulletin*, 127(2), 267–286. <https://doi.org/10.1037/0033-2909.127.2.267>
- Mattila, A., & Wirtz, J. (2000). The role of preconsumption affect in post-purchase evaluation of services. *Psychology & Marketing*, 17(7), 587–605.
- Mattila, A., & Wirtz, J. (2006). Arousal expectations and service evaluations. *International Journal of Service Industry Management*, 17(3), 229–244. <https://doi.org/10.1108/09564230610667087>
- Mattila, A. S., & Wirtz, J. (2008). The role of store environmental stimulation and social factors on impulse purchasing. *Journal of Services Marketing*, 22(7), 562–567. <https://doi.org/10.1108/08876040810909686>
- Mehrabian, A. (1996). Analysis of the big-five personality factors in terms of the PAD temperament model. *Australian Journal of Psychology*, 48(2), 86–92.
- Mehrabian, A., & O'Reilly, E. (1980). Analysis of personality measures in terms of basic dimensions of temperament. *Journal of Personality and*

- Social Psychology*, 38(3), 492–503. <https://doi.org/10.1037/0022-3514.38.3.492>
- Mehrabian, A., & Russell, J. A. (1974). *An approach to environmental psychology*, Cambridge, MA: The MIT Press.
- Mellers, B. A., & McGraw, A. P. (2001). Anticipated emotions as guides to choice. *Current Directions in Psychological Science*, 10(6), 210–214. <https://doi.org/10.1111/1467-8721.00151>
- Menon, S., & Kahn, B. (2002). Cross-category effects of induced arousal and pleasure on the internet shopping experience. *Journal of Retailing*, 78(1), 31–40. [https://doi.org/10.1016/S0022-4359\(01\)00064-1](https://doi.org/10.1016/S0022-4359(01)00064-1)
- Menon, S., & Kahn, B. E. (1995). The impact of context on variety seeking in product choices. *Journal of Consumer Research*, 22(3), 285–295. <https://doi.org/10.1086/209450>
- Mower, J. M., Kim, M., & Childs, M. L. (2012). Exterior atmospherics and consumer behavior: Influence of landscaping and window display. *Journal of Fashion Marketing and Management*, 16(4), 442–453. <https://doi.org/10.1108/13612021211265836>
- Myrick, J. G., & Nabi, R. L. (2017). Fear arousal and health and risk messaging. In *Oxford research encyclopedia of communication*, Oxford, England: Oxford University Press. <https://doi.org/10.1093/acrefore/9780190228613.013.266>
- Nielson. (2020a). From the field: Nielsen South Korea offers personal insight on shopping trends amid the Covid-19 outbreak. Retrieved from <https://www.nielsen.com/us/en/insights/article/2020/from-the-field-nielsen-south-korea-offers-personal-insight-on-shopping-trends-amid-the-covid-19-outbreak/>
- Nielson. (2020b). Key consumer behavior thresholds identified as the coronavirus outbreak evolves. Retrieved from <https://www.nielsen.com/us/en/insights/article/2020/key-consumer-behavior-thresholds-identified-as-the-coronavirus-outbreak-evolves/>
- Noy, I., & Shields, S. (2019). The 2003 severe acute respiratory syndrome epidemic: A retroactive examination of economic costs.
- Raghunathan, R., & Pham, M. T. (1999). All negative moods are not equal: Motivational influences of anxiety and sadness on decision making. *Organizational Behavior and Human Decision Processes*, 79(1), 56–77.
- Reich, J. W., & Zautra, A. J. (2002). Arousal and the relationship between positive and negative affect: An analysis of the data of Ito, Cacioppo, and Lang (1998). *Motivation and Emotion*, 26(3), 209–222.
- Reisenzein, R. (1994). Pleasure-arousal theory and the intensity of emotions. *Journal of Personality and Social Psychology*, 67(3), 525–539. <https://doi.org/10.1037/0022-3514.67.3.525>
- Roy Dholakia, R. (1999). Going shopping: Key determinants of shopping behaviors and motivations. *International Journal of Retail & Distribution Management*, 27(4), 154–165. <https://doi.org/10.1108/09590559910268499>
- Ruiter, R. A., Abraham, C., & Kok, G. (2001). Scary warnings and rational precautions: A review of the psychology of fear appeals. *Psychology and Health*, 16(6), 613–630. <https://doi.org/10.1080/08870440108405863>
- Ruiter, R. A., Kessels, L. T., Peters, G. J. Y., & Kok, G. (2014). Sixty years of fear appeal research: Current state of the evidence. *International Journal of Psychology*, 49(2), 63–70. <https://doi.org/10.1002/ijop.12042>
- Rydell, R. J., Mackie, D. M., Maitner, A. T., Claypool, H. M., Ryan, M. J., & Smith, E. R. (2008). Arousal, processing, and risk taking: Consequences of intergroup anger. *Personality and Social Psychology Bulletin*, 34(8), 1141–1152. <https://doi.org/10.1177/0146167208319694>
- Sadique, M. Z., Edmunds, W. J., Smith, R. D., Meerding, W. J., de Zwart, O., Brug, J., & Beutels, P. (2007). Precautionary behavior in response to perceived threat of pandemic influenza. *Emerging Infectious Diseases*, 13(9), 1307–1313. <https://doi.org/10.3201/eid1309.070372>
- Salters-Pedneault, K., Gentes, E., & Roemer, L. (2007). The role of fear of emotion in distress, arousal, and cognitive interference following an emotional stimulus. *Cognitive Behaviour Therapy*, 36(1), 12–22. <https://doi.org/10.1080/16506070600874281>
- Savitsky, K., Medvec, V. H., Charlton, A. E., & Gilovich, T. (1998). "what, me worry?": Arousal, misattribution, and the effect of temporal distance on confidence. *Personality and Social Psychology Bulletin*, 24(5), 529–536.
- Schiffstein, H. N., & Tanudjaja, I. (2004). Visualising fragrances through colours: The mediating role of emotions. *Perception*, 33(10), 1249–1266. <https://doi.org/10.1068/p5132>
- Schmidt, B., Mussel, P., & Hewig, J. (2013). I'm too calm—Let's take a risk! On the impact of state and trait arousal on risk taking. *Psychophysiology*, 50(5), 498–503. <https://doi.org/10.1111/psyp.12032>
- Schwarz, N., Bless, H., Strack, F., Klumpp, G., Rittenauer-Schatka, H., & Simons, A. (1991). Ease of retrieval as information: Another look at the availability heuristic. *Journal of Personality and Social Psychology*, 61(2), 195–202.
- Schwarz, N., & Vaughn, L. A. (2002). The availability heuristic revisited: Ease of recall and content of recall as distinct sources of information. In T. Gilovich, D. Griffin, & D. Kahneman (Eds.), *Heuristics and biases: The psychology of intuitive judgment* (pp. 103–119). Cambridge, England: Cambridge University Press. <https://doi.org/10.1017/CBO9780511808098.007>
- She, S., Eimontaite, I., Zhang, D., & Sun, Y. (2017). Fear, anger, and risk preference reversals: An experimental study on a Chinese sample. *Frontiers in Psychology*, 8, 1–8. <https://doi.org/10.3389/fpsyg.2017.01371>
- Shedler, J., & Manis, M. (1986). Can the availability heuristic explain vividness effects? *Journal of Personality and Social Psychology*, 51(1), 26–36. <https://doi.org/10.1037/0022-3514.51.1.26>
- Slovic, P., & Peters, E. (2006). Risk perception and affect. *Current Directions in Psychological Science*, 15(6), 322–325. <https://doi.org/10.1111/j.1467-8721.2006.00461.x>
- Smith, C. A., & Ellsworth, P. C. (1985). Patterns of cognitive appraisal in emotion. *Journal of Personality and Social Psychology*, 48(4), 813–838.
- Steimer, T. (2002). The biology of fear-and anxiety-related behaviors. *Dialogues in Clinical Neuroscience*, 4(3), 231–249.
- Strong, P. (1990). Epidemic psychology: A model. *Sociology of Health & Illness*, 12(3), 249–259. <https://doi.org/10.1111/1467-9566.ep11347150>
- Sunstein, C. R. (2003). Terrorism and probability neglect. *Journal of Risk and Uncertainty*, 26(2–3), 121–136. <https://doi.org/10.1023/A:1024111006336>
- Szymkowiak, A., Kulawik, P., Jeganathan, K., & Guzik, P. (2020). In-store epidemic behavior: scale development and validation. arXiv preprint: 2005.02764.
- Tversky, A., & Kahneman, D. (1973). Availability: A heuristic for judging frequency and probability. *Cognitive Psychology*, 5(2), 207–232. [https://doi.org/10.1016/0010-0285\(73\)90033-9](https://doi.org/10.1016/0010-0285(73)90033-9)
- Vieira, V. A. (2013). Stimuli–organism–response framework: A meta-analytic review in the store environment. *Journal of Business Research*, 66(9), 1420–1426. <https://doi.org/10.1016/j.jbusres.2012.05.009>
- Warr, P. (1994). A conceptual framework for the study of work and mental health. *Work and Stress*, 8, 84–97.
- Wierzbna, M., Riegel, M., Wypych, M., Jednoróg, K., Turnau, P., Grabowska, A., & Marchewka, A. (2015). Basic emotions in the Nencki affective word list (NAWL BE): New method of classifying emotional stimuli. *PLoS One*, 10(7), e0132305.
- Wirtz, J., Mattila, A., & Tan, R. (2007). The role of arousal congruency in influencing consumers' satisfaction evaluations and in-store behaviors. *International Journal of Service Industry Management*, 18(1), 6–24. <https://doi.org/10.1108/09564230710732876>
- Yani-de-Soriano, M. M., & Foxall, G. R. (2006). The emotional power of place: The fall and rise of dominance in retail research. *Journal of Retailing and Consumer Services*, 13(6), 403–416. <https://doi.org/10.1016/j.jretconser.2006.02.007>
- Zajonc, R. B. (1980). Feeling and thinking: Preferences need no inferences. *American Psychologist*, 35(2), 151–175. <https://doi.org/10.1037/0003-066X.35.2.151>

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