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Marketing the use of headgear in high contact sports

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ABSTRACT

High contact sports have gained popularity among consumers, who often seek thrills and the feeling of invincibility by risking their well-being. One major health risk associated with these sports is head injuries, including trauma, concussion, and sleep disruption. In this research, we investigate the effect of consumers' product choice difficulty on their health risk assessments. We illustrate a novel mediating route by documenting how and when choice maximization can help consumers make the optimal choice when faced with the many products available in the market. To aid their decisions, consumers require communication about the health benefits of the product (first-stage boundary condition) but not at the expense of reducing their game-playing enjoyment (second-stage boundary condition). The paper concludes with contributions to and implications for theory and practice and a research agenda to guide future inquiries in this under-researched area.

1. Introduction

Physical exercise is crucial to maintaining a healthy lifestyle (van Esch et al., 2019). However, sporting injuries also present individual and social health problems, including pain, physical inactivity, medical treatment, and work absenteeism and the direct and indirect costs associated with these factors (Marshall and Guskiewicz, 2003; Vriend et al., 2017). On average, there are 8.6 million sports- and recreation-related injury episodes reported annually in the U. S. (Sheu et al., 2016). Traumatic brain injury (TBI), concussion specifically, is one of the most potentially dangerous types of injuries sustained in high contact and collision sports (Cantu, 1996). In fact, many concussions are unreported or even unrecognized by athletes and coaches (Kerr et al., 2014). The risk of concussion is greatest for people participating in collision sports, such as rugby, ice hockey, Tae kwon do, and American football (Black et al., 2017; Covassin et al., 2003; Harmon et al., 2013; Koh et al., 2003; Pfister, T., Pfister, K., Hagel, Ghali and Ronksley 2016; Tommasone and McLeod, 2006; Zuckerman et al., 2015). As such, head injury interventions are of extreme importance to consumers, retailers, and policy makers, and societal health in general.

Most of the (health) intervention research focuses on individual behavior change, including the use of personal protective equipment (PPE) and specific training or education programs to reduce the risk of injuries (Klügl et al., 2010; McGlashan and Finch, 2010). One type of prevention strategy for TBI is through protective headgear and helmets for head protection. Previous social marketing campaigns and targeted education-based information campaigns have focused on increasing helmet use in both cycling (Ludwig et al., 2005) and skiing (Levy et al., 2007). However, there is very limited use of PPE in high contact sports injury prevention (Donaldson and Poulos, 2014). Overall, there is a need to transform sports injury prevention information and research into effective, mainstream marketing campaigns to enable effective consumer decision-making regarding PPE purchase and use. Marketing campaigns can also counter misconceptions regarding helmet use and safety (Joseph et al., 2014). Such campaigns are not only of interest to public health campaigners but also retailers of sporting PPE.

Consequently, our research examines how retailers and social marketers can improve PPE use in high contact sports (e.g., in sports where PPE is not compulsory) and investigate the factors that influence an individual's assessment of risk (e.g., not wearing PPE). The socio-ecological model informs our work, which suggests that individual change is based on individual characteristics (i.e., knowledge, attitudes, and beliefs) and the external social (i.e., social norms) and physical environment (i.e., availability, choice) (Newton et al., 2013; Thompson

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et al., 2002). For example, research indicates Enduro mountain bikers use of PPE to be correlated with the individual and environmental elements such as perceived benefits, financial costs, social cues, comfort, and severity of consequences, but not with perceptions of potential harm, danger, and media/communication about PPE (Pratt et al., 2019). Informed by the socio-ecological model, our research focuses on risk assessment (perceived threat), the perceived health benefits of PPE, the external (choice difficulty), and individual barriers (choice maximization) towards PPE adoption. Hence, the purpose of this study is first, to investigate the influence of choice difficulty on health risk assessment as part of how consumers purchase PPE for participation in high contact sports. Second, to explore the effect of the consumers' choice maximization (e.g. underlying causal mechanism) in mediating the relationship between choice difficulty on health risk assessment. Lastly, to explore the effect of both the health benefits of the product and game playing enjoyment as 1st and 2nd stage dual moderators (e.g. boundary conditions) on the mediated model. This research is expected to guide consumers external choices and individual barriers when either purchasing/adopting PPE in relation to high contact sports. For marketers/retailers, the research indicates they also need to focus on the consumers' perceptions of the health benefits of the product and their game playing enjoyment, especially if they want to positively increase consumers' risk assessment likelihood.

The research study employs a cross-sectional design to examine the influence of choice difficulty on health risk assessment. We also investigate the mediating effect of choice maximization and the moderating effect of the product's health benefits and game-playing enjoyment (Fig. 1). Next, the paper proceeds with a literature review to discuss the various constructs to develop our hypotheses and proposed conceptual framework. Supporting this theoretical model, we then present the design, procedures, and results of the study. We conclude with theoretical and practical implications, as well as directions for future research.

2. Literature review and hypothesis development

2.1. Personal protective equipment use

Although partaking in sports is a healthy activity for physical and mental productivity, the risks associated with head injuries in high contact sports are many (Raikes et al., 2019). Every year in the U.S., 3.3 million mild traumatic head injuries, including concussion, insomnia, and daytime sleepiness, are associated with participants refraining from wearing PPE (Raikes et al., 2019). At the same time, 50% of sport-related head injuries are unreported, making head injuries a vital health focus in the medical and marketing disciplines to promote the importance of using PPE (Raikes et al., 2019).

Biomechanical research demonstrates that PPE reduces the impact forces to the brain, but research results in the field have not seen any differences in rate or severity of concussion (Daneshvar et al., 2011). In such cases, risk compensation is an important factor associated with PPE use, which may give players a false sense of security, resulting in a more dangerous play (Hagel and Meeuwisse, 2004). However, for sports such as skiing, snowboarding, and cycling, there is evidence that helmets reduce the incidence of head injuries (Benson et al., 2009). Nevertheless, for sports for which PPE is optional, players should be given the best and most accurate information in order to make their own choice about injury prevention strategies. This point is where targeted education campaigns, through retailers or social marketers, and changes to the retail landscape and offerings can aid individual behavior change (van Esch et al., 2020). Such campaigns should be informed by theoretical behavior change models; something which sports injury prevention studies very rarely utilize (McGlashan and Finch, 2010).

2.2. Behavior change for the use of personal protective equipment

Behavior directly influences injury prevention through PPE's use or non-use (Verhagen et al., 2010). Several models explain how individuals change their behavior; one of the most comprehensive models is the socio-ecological model (Brennan et al., 2014). The socio-ecological model of behavior demonstrates that individuals are influenced by factors associated with the individual themselves and the environment (McLeroy et al., 1988). Reciprocal determinism establishes the interplay between the individual, the behavior, and the environment (Bandura, 1978). At the individual level, PPE's use is based on knowledge, attitudes, and beliefs, such as knowledge about helmet safety and attitudes towards wearing PPE (Chi and Kilduff, 2011). Individual characteristics, such as a person's choice of maximization tendencies, also influence behaviors. Individuals are also influenced by their social environment, such as social norms and enforcement, and by their physical environment, such as the availability of helmets (i.e., the choice of PPE available may directly impact whether individuals purchase helmets) (Newton et al., 2013; Thompson et al., 2002). Cues to action, such as media influences and health issue experiences, may also trigger behavior change (Ross et al., 2010).

However, ecological models are rarely used in injury prevention interventions (Gielen and Sleet, 2003; Trifiletti et al., 2005; Verhagen et al., 2010). Specifically, biomechanical models commonly used to assess injury causation and prevention do not consider psycho-social (Van Tiggelen et al., 2008) or environmental factors. In their systematic review, McGlashan and Finch (2010) found that only 11 percent of sports injury prevention studies explicitly used behavioral and social sciences theories. Hence, incorporating a behavioral approach to sports injury prevention (e.g., marketing PPE to consumers) is needed to inform effective interventions (Gielen and Sleet, 2003; Trifiletti et al., 2005; Verhagen et al., 2010). More importantly, behavioral models provide a framework for "studying problems, identifying target groups and behaviors for intervention, developing appropriate interventions and for evaluating intervention success" (McGlashan and Finch, 2010, p. 842). For example, De Nooijer, De Wit, and Steenhuis (2004) found that wearing protective gear for in-line skaters was affected by social influences, self-efficacy expectations, and intention. Consequently, it is essential to study the social-psychological determinants of wearing PPE (De Nooijer, De Wit and Steenhuis, 2004), which can help organizations design effective marketing interventions (McGlashan and Finch, 2010; Trifiletti et al., 2005). Consequently, we focus on individual characteristics (choice maximization) and perceptions (risk assessment/perceived threat and health benefits of PPE) and the external barriers to PPE

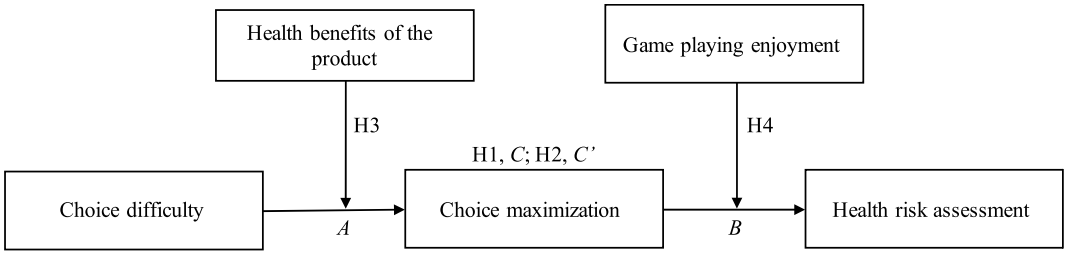

Fig. 1. Conceptual framework.

adoption (choice difficulty). Most importantly, an individual's health risk assessment influences their use of PPE.

2.3. Health risk assessment

Whilst there is a wealth of evidence supporting that bodily impact(s) are the primary cause for traumatic brain injury, there is limited evidence supporting the type of health risk assessments conducted by those engaging in the sport and how they process the likelihood of interventions (e.g., PPE) to reduce any potential hazards (Bachynski and Goldberg, 2014). An athlete's risk assessment rests on their level of risk tolerance, protection, accident, and assault expectation (Kummeneje and Rundmo, 2019). In this research, we identify health risk assessment as the participant's belief in the likelihood of health problems occurring due to engaging in high contact sports (Shrier, 2015). However, extreme sports have positive perceptions with the challenges, risks, and difficulties extreme sports possess (Raggiotto et al., 2019). Thus, what attracts participants to high risk sports is that the sport involves some danger, and this attraction poses a challenge for retailers marketing PPE to thrill-seeking consumers (Kummeneje and Rundmo, 2019).

The risk assessment of consumers derives from their cognitive and emotional state that directly impacts their behavior (Bran and Vaidis, 2019). The participants' ability to assess the health risk assessment of partaking in high contact sports resides in their integration of judgment and the available information (Chamarro et al., 2018). In the context of high contact sports, often these two elements (health assessment and risk) can conflict as participants are aware of the dangers but are excited by challenging these dangers (Chamarro et al., 2018). Research shows risk assessment is often driven by emotional reactions rather than cognitive assessment, indicating that although participants are aware of the dangers of not wearing PPE during the sport, the thrill-seeking emotional appeal that induces positive game-playing enjoyment will negatively impact their risk assessment to purchase protective gear (Kummeneje and Rundmo, 2019). Sometimes, individuals may even believe their sport is less dangerous than others, even when this belief is unsubstantiated (e.g., Braham et al., 2004; Finch et al., 2003; Taylor et al., 2005). Other research also indicates risk perceptions are low, for example, for surfing (i.e., 5.7% consider it high risk and 32.3% moderate risk) (Taylor et al., 2005). Therefore, these conflicting emotions reduce the participants' objective decision-making in using PPE (Chamarro et al., 2018). As such, traditional marketing tactics (i.e., portraying the risk and safety issues) are not effective for high contact sports as the participants' assessment of risk is very different (Van Tiggelen, Wickes, Stevens, Roosen and Witvrouw, 2008). Therefore, for sport participants to fully understand the health risk assessment of high contact sports, both cognitive and emotional marketing appeals are important (Kummeneje and Rundmo, 2019). In addition, beyond the information and appeals in social marketing campaigns, external barriers to PPE adoption, namely, choice difficulty are also an important consideration for marketers and retailers (Armstrong et al., 2020).

2.4. Choice difficulty

Environmentally, helmets' availability (and choice involvement) is an important factor in decision making. For example, environmental factors such as availability, accessibility, and cost are barriers to bicycle helmet usage (Thompson et al., 2002). Rugby, in particular, has seen a significant increase in the number of PPE products offered, as has soccer (Caswell et al., 2007) and mountain biking. As such with the "high cost and volume of types of equipment available" (i.e., mouthguards, shin gear, and other PPE for simultaneous use) this often forces a choice (Pratt et al., 2019, p. 29). Research has shown that when consumers face a large choice set, they are less likely to select one of the options than when presented with a smaller choice set (Fasolo et al., 2007); this phenomenon is called the *tyranny of too much choice*.

Difficult decision environments can come in the form of overwhelming choice (i.e., in products, brands, and stores). Information load increases when attributes and alternatives increase (Jacoby et al., 1974; Malhotra, 1982) but can also be affected by other dimensions of information such as the number of attribute levels (i.e., different types of head protection) and the uniformity of attributes among alternatives (i.e., the similarity between PPE options) (Lurie, 2004). Such information overload leads to choice difficulty (Chamarro et al., 2018). In this case, *choice difficulty* is defined as the frustration and hesitancy that impact decision-making (Willemsen et al., 2016) in participants when purchasing PPE.

When understanding the actual health risks varies, consumers use different logic and methods to evaluate the risk (Nicholson, Soane, Fenton-O'Creevy and Willman, 2005). Moreover, the concept of a health risk assessment can be difficult to understand and making an informed decision can become complicated (West and Bramwell, 2006). Recent reports indicate that consumers want the option of a health risk assessment, but at the same time, they may have difficulty in making the initial decision when presented with too much choice (Stacey et al., 2017). This situation leads consumers to a position of "*I want a choice, but I don't want to decide,*" which encompasses consumers' complex feelings about a health risk assessment (Marteau, 1999). Therefore, choice difficulty will negatively impact consumer assessments of health risk in high contact sports (Warren and Lupinek, 2019; Willemsen et al., 2016). Stated formally:

H1. The choice difficulty of using PPE will negatively influence a health risk assessment.

2.5. Choice maximization

As the market becomes saturated with PPE choices, the decision-making process becomes more difficult. The decision-making frustrates sports' participants, leading them to be pressured into making the optimal choice (Warren and Lupinek, 2019). Research indicates the consumers who have limited subjective knowledge on the product will make the optimal choice in conditions that a variety of alternative options are available (Hadar and Sood, 2014). Conversely, when the consumer has a higher subjective knowledge about the product, they experience difficulty making the optimal choice (Hadar and Sood, 2014).

Through a marketing lens, it may be the retailers' responsibility to ease the individuals' decision-making process by marketing the health benefits of the product while still keeping the allure of challenging and risk to induce the enjoyment of game-playing (Arli et al., 2019; Warren and Lupinek, 2019). *Choice maximization* is defined as the participant's desire to make the optimal choice (van Ryzin and Vulcano, 2017).

The measure of maximization tendency in individuals encompasses three dimensions: first, a continual tendency to seek better options; second, choosing and making decisions is difficult, and finally, a tendency to hold high standards (Nenkov et al., 2008). Choice maximizers tend to agonize over decisions, where satisficers may be happy with selecting a "good enough" option (Schwartz et al., 2002). In accord, Roets et al. (2012) suggest that the implications of choice maximization for decision quality are highly significant to a variety of personal decision-making domains, for example, career (Iyengar et al., 2006), negotiations (Hackley, 2006), family life (Barrett-Howard and Tyler, 1986), and consumer choice (Misuraca et al., 2015). Therefore, choice maximization will influence consumers' choice difficulty in relation to a health risk assessment. Stated formally:

H2. Choice maximization will positively mediate the relationship between choice difficulty and a health risk assessment.

2.6. Health benefits of the product

Beyond making a choice in the marketplace (i.e., choice difficulty and choice maximization), the perceived health benefits of wearing a

helmet play also play a large role in decision making. Health benefits of the product are defined as the participant's ability to think of the health consequences of using the product (Dahl and Hoeffler, 2004). Commonly, individuals believe other sports, rather than their own, are more dangerous and have a higher risk of injuries (i.e., head injury) (e.g., Braham et al., 2004; Finch et al., 2003; Taylor et al., 2005). For example, Australian Rules football players considered rugby, boxing, and driving a car to be associated with a higher risk of head injury than Australian Rules football, which they perceived to be low to moderate in risk (Finch et al., 2003). Consequently, while 80% of players said they would wear PPE if it prevented injury, the belief that their sport was not as dangerous as other sports may have prevented them from wearing PPE (Finch et al., 2003). Such perceptions of general lower risk in their sport may influence a belief in the need for PPE. Taylor et al. (2005) found that the majority (over 60%) of surfers believe wearing protective PPE results in a lower rate of injury, while 40% of Australian Rules footballers thought PPE would result in less likelihood of being injured (Finch et al., 2003). Thus, research demonstrates that individuals may believe that PPE does not provide adequate protection. Disconcertingly, there seems to be a general lack of knowledge and education about PPE's importance. For example, Pratt et al. (2019) found that most mountain bikers had never seen any advertising suggesting PPE's importance or benefit for injury prevention. Overall, it may be a lack of knowledge and misinformation, which reduces the risk perception exhibited in previous studies (Finch et al., 2003; Taylor et al., 2005). Hence, providing the product's health benefits will positively moderate the relationship between choice difficulty and maximization when purchasing PPE. Stated formally:

H3. Health benefits of the product will have a positive first stage moderating effect on the influence of choice difficulty on health risk assessment mediated by choice maximization, resulting in a moderated mediation.

2.7. Game playing enjoyment

While the perceived health benefits of PPE plays an important role, other reasons for not wearing PPE include comfort and that individuals, overall, do not like wearing PPE (Braham et al., 2004; Finch et al., 2003). Numerous studies across various sports have shown that participants do not wear PPE due to interference with game performance and sport enjoyment (Braham et al., 2004; Dean and Bundon, 2020; Finch et al., 2003; Taylor et al., 2005). For example, in hockey, mouth guards make it harder to breathe (Rapisura et al., 2010; Taylor et al., 2005), while surfers felt PPE was uncomfortable and could hinder their performance (Dean and Bundon, 2020). Yet, research indicates that PPE, such as mouthguards, does not affect aerobic performance (Rapisura et al., 2010). Thus, while individuals may have a great enjoyment of a high contact sport, they may be reluctant to wear PPE, which interferes with their ability to fully enjoy the sport (Jular and Kasnakoglu, 2017).

The experiential aspects of consumption in general and intrinsically motivated hedonic enjoyment are well documented (Holbrook et al., 1984). Within the wide-ranging class of consumer behavior, games (e.g., sports and other physical leisure activities) comprise a common and influential type of consumption experience (e.g., playful consumption) that is congruent with both emotional and physical aspects (Lim et al., 2010).

Game playing enjoyment is different for adrenaline seekers participating in high contact sports as they often seek sensation and enjoyment in challenging the limits of their psychological and physical abilities (Raggiotto et al., 2019). These enjoyments create sensations of self-enhancement and invincibility (Castanier et al., 2010; Raggiotto et al., 2019). Over time, research indicates that as an athlete increases in expertise, they gain higher emotional intelligence, and as a consequence, take more risks as they perceive they have the emotional intelligence to cope with higher negative aftermaths (Vaughan et al., 2019). Simultaneously, they gain a higher threshold of enjoyment and thrill for the sport (Vaughan et al., 2019). Therefore, providing the appeal of safety when advertising in these sports types will negatively affect purchase intention as safety reduces the positive perception of game-playing enjoyment (Raggiotto et al., 2019). Therefore, *game playing enjoyment*, defined as the individual's expression of enjoyment with high contact sports, will negatively impact their choice in PPE and health risk assessment. Stated formally:

H4. Game playing enjoyment will have a negative second stage moderating effect on the moderated mediation (CD-HBP-CM-HRA), resulting in a dual-stage moderated mediation.

3. Methodology

3.1. Data collection

To examine the anticipated relationships between health risk assessment, choice difficulty, choice maximization, health benefits of the product, and game-playing enjoyment, we deployed a cross-sectional design in which we recruited 435 adults (final sample) via Amazon Mechanical Turk (MTurk) with a HIT approval rate higher than 95%, and who had already completed more than 100 HITs successfully. Participants received a reasonable pay rate compared to similar survey tasks (USD 0.10) for completing the survey. The extant literature supports Amazon's Mechanical Turk use in social science research (Hauser and Schwarz, 2016; Smith et al., 2016).

Participants reported the following demographics: gender (Male = 62.4%), age (18–25 = 58.8%), ethnicity (African American = 23.5%, Asian = 17.2%, Caucasian = 59.3%).

We asked participants a series of questions based on existing and established measures but without specifying a particular sport, PPE type, or brand. In addition, there was no mention of any anticipated efficiency or effectiveness benefits about PPE and its use, nor the length of time that PPE may or may not have been in use. In general, the instructions to complete the survey were purposefully brief to avoid shaping participants' perceptions of PPE use in high contact sports and thereby allowing participants' existing perceptions and attitudes to remain operational.

3.2. Measures

This study used established scale items. The health risk assessment was adapted from Chattopadhyay et al. (2013) and comprised four items intended to measure a person's estimate of the likelihood of experiencing a certain health problem (*Very unlikely (1)* and *(5) Very likely*). We adapted choice difficulty from Xu et al. (2013). The measure is comprised of three items intended to measure the frustration and hesitancy which a person would experience concerning a particular decision (*Not at all (1)* and *(9) Very much*). Choice maximization was adapted from Xu et al. (2013). The measure is comprised of four items intended to measure one's chronic desire to make the optimal choice when making decisions (*Strongly disagree (1)* and *(5) Strongly agree*). We adapted the health benefits of the product from Spassova and Lee (2013); it is comprised of three items intended to measure the degree to which a person thinks about the immediate health-related consequences of using the product (*Not at all (1)* and *(7) A lot*). Game playing enjoyment was adapted from Peters and Leshner (2013) and is comprised of three items intended to measure the degree to which a person expresses enjoyment for playing a particular game (*Strongly disagree (1)* and *(5) Strongly agree*).

Considering tested variables were collected using the same method and source of measurement, we employed procedural remedies to control for such bias via using different scale formats –such as a different number of scale points, anchor labels (Podsakoff et al., 2012). In doing so, we minimized scale properties shared by tested variables, and

prevented participants from using the same cognitions in answering different questions.

In additional to procedural remedies beforehand, we also employed statistical remedies and conducted a Herman's single factor test (Podsakoff, 2003). Specifically, we entered all variables measured in an Exploratory Factor Analysis (EFA) using a non-rotated solution. The analysis yielded four factors with initial eigenvalues greater than 1.0 and accounted for 64.50% of total variance observed. More importantly, the results showed that, reassuringly, the maximum variance that can be explained by a single factor was only 32.51% of total variance (<50%). Therefore, there was minimal possibility of encountering common method bias (Lindell and Whitney, 2011; Lee et al., 2020). Table 1 summarizes the scale items used in this study.

4. Results

In support of H_1 to H_4 and to test for conditional effects with both first and second-stage moderation (e.g., dual moderated mediation), we employed the PROCESS macro by Hayes et al. (2017; Model 21; 10,000 bootstrapped samples). See Table 2.

In support of H_1, the results show a negative effect on the relationship between choice difficulty and health risk assessment (B = −.05, *SE* = 0.01, $t = -4.13$, $p < .01$, CI95% = −0.07, −0.03). To investigate the role of choice maximization in the process that links choice difficulty and health risk assessment and in support of H_2, the analysis yielded a significant dual moderated mediation effect (index of dual moderated mediation = −0.0056, *SE* = 0.0030, CI95% = −0.0127, −0.0008).

Further analysis of the conditional indirect effects further supports the health benefits of the product as a moderator (H_3) and game-playing enjoyment as a moderator (H_4) on health risk assessment. We analyzed the conditional indirect effects at three values for each moderator. For the health benefits of the product, the mean (5.56), one standard deviation below the mean (4.49), and one standard deviation above the mean (6.63). For game-playing enjoyment, the mean (3.78), one standard deviation below the mean (2.87), and one standard deviation above the mean (4.69). The bootstrap CIs indicated significant effects at the lower levels (SD-1) for both, health benefits of the product and game-playing enjoyment, but not at the higher levels (SD + 1) (Table 3).

In further support of H_3, the results indicate the two predictors explained 33% of the variance ($R^2 = 0.30$, $F(3, 431) = 57.21$, $p < .01$). Health benefits of the product significantly predicted choice maximization (β = 0.32, $t(431) = 10.97$, $p = .01$), as did choice difficulty (β = −0.06, $t(431) = -4.41$, $p = .01$). The interaction, accounted for a significant proportion of the variance ($\Delta R^2 = 0.03$, $\Delta F(1, 431) = 14.40$, β = 0.05, $t(431) = 3.80$, $p = .01$).

In further support of H_4, the results indicate the two predictors explained 34% of the variance ($R^2 = 0.34$, $F(3, 431) = 83.29$, $p < .01$). Game playing enjoyment significantly predicted health risk assessment (β = 0.14, $t(431) = 3.26$, $p = .01$), as did choice maximization (β = 0.51, $t(431) = 11.05$, $p = .01$). The interaction, accounted for a significant proportion of the variance ($\Delta R^2 = 0.02$, $\Delta F(1, 431) = 6.74$, β = −0.12, $t(431) = -2.60$, $p = .01$). See Fig. 2.

Our research indicates that the relationship between trendiness and the indirect effect of choice difficulty on health risk assessment mediated by choice maximization is a linear condition based on game-playing enjoyment. This relationship is the index of conditional moderated mediation by the health benefits of the product for this model. It quantifies the relationship between the health benefits of the product and the size of the indirect effect of choice difficulty conditioned on game-playing enjoyment. The relationship between game-playing enjoyment and the indirect effect of choice difficulty is a linear function of the product's health benefits. This linear function is the index of conditional moderated mediation by game-playing enjoyment and quantifies the relationship between game-playing enjoyment and the size of the indirect effect of choice difficulty on the product's health benefits. Finally, conditional moderated mediation indices indicate the share (choice difficulty x the health benefits of the product → choice maximization) x (choice maximization x game-playing enjoyment → health risk assessment) of the weighting for game-playing enjoyment. Lastly, the index of dual moderated mediation for this model quantifies the rate of change in the moderation by the product's health benefits on the indirect effect of choice difficulty as game-playing enjoyment changes, as well as the rate of change in the moderation by game-playing enjoyment on the indirect effect of choice difficulty as the health benefits of the product changes (Hayes, 2018).

Table 1
Reliability, descriptive statistics, and Cronbach's alpha.

Scales	Mean (SD)	1.	2.	3.	4.	5.
1. Health Risk Assessment (HRA)	4.10 (0.72)	[0.78]				
2. Choice Difficulty (CD)	3.93 (2.56)	-.29**	[0.94]			
3. Choice Maximization (CM)	4.09 (0.72)	.54**	-.27**	[0.76]		
4. Health Benefits of the Product (HBP)	5.56 (1.07)	.57**	-.23**	.49**	[0.71]	
5. Game-Playing Enjoyment (GPE)	3.78 (0.91)	.25**	0.05	.19**	.32**	[0.84]

Note: Cronbach's Alpha = [α = > 0.70]; ** Correlation is significant at the 0.01 level.

Table 2
Dual moderated mediation regression results.

Independent Variables	Choice Maximization	Health Risk Assessment
Constant	.04 (.03)	4.11** (.03)
Choice Difficulty	-.06** (.01)	-.05** (.01)
Health Benefits of the Product	.32** (.03)	–
Choice Difficulty x Health Benefits of the Product	.05** (.01)	–
Choice Maximization	–	.46** (.05)
Game-Playing Enjoyment	–	.15 (.04)
Choice Maximization x Game-Playing Enjoyment	–	-.10* (.05)
R^2	.30	.36
MSE	.37	.34
F	57.21**	73.65**
Df	3, 431	4, 430

Note: The Numbers in parentheses are standard errors; *$p < .05$, **$p < .01$.

Table 3
Conditional indirect effects of X on Y.

Conditional indirect effect (IE) of Choice Difficulty for:				
		Boot IE	Boot SE	95% Bootstrap CI
Low HBP	4.49	-.07	.02	-.10 to −.03
	5.56	-.06	.01	-.08 to −.03
	6.63	-.04	.01	-.07 to −.02
High HBP	4.49	-.00	.01	-.02 to .01
	5.56	-.00	.01	-.01 to .01
	6.63	-.00	.01	-.01 to .01
Low GPE	2.87	-.07	.02	-.10 to −.03
	3.78	-.03	.01	-.05 to −.02
	4.69	-.00	.01	-.02 to .01
High GPE	2.87	-.04	.01	-.07 to −.02
	3.78	-.02	.01	-.04 to −.01
	4.69	-.00	.01	-.01 to .01

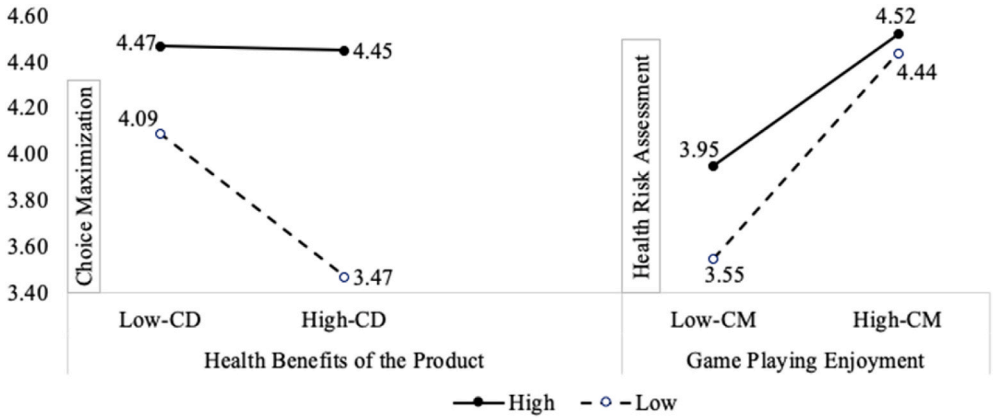

Fig. 2. Moderating effects of HBP and GPE

5. General discussion and implications

Our research provides insight for retailers and social marketers into the use of PPE to prevent serious injury. For retailers and social marketers wanting to reduce consumers' choice difficulty in order to increase consumers' health risk assessment when it comes to wearing PPE in high contact sports, retailers and social marketers must focus on the indirect effects of the product's health benefits, game-playing enjoyment, and consumers' choice maximization.

5.1. Theoretical implications

Our research makes four important theoretical contributions. First, the research contributes to an enhanced understanding of health interventions in high contact sports. We bridge social marketing and behavioral literature, adhering to calls for further research (Gielen and Sleet, 2003; Trifiletti et al., 2005; Verhagen et al., 2010). Our investigation demonstrates the importance of both individual barriers, namely perceived risk, health benefits of PPE and choice maximization, and external barriers, such as availability/choice. Theoretically, the findings add to the literature on how participants in high contact sports make judgments about potential risks to their safety (Chamarro et al., 2018), provide effective health advice to combat injury, and inform social marketing campaigns and retailers (van Esch et al., 2014a,b). In this vein, the research contributes to a behavioral approach to sports injury prevention (McGlashan and Finch, 2010; Van Tiggelen et al., 2008).

Second, we identify a novel maximizer-based psychological mechanism on health risk assessment. We contribute and extend maximization theory (Rachlin et al., 1981) by suggesting choice maximization as a mediating variable. For the first time, the research shows in an abundant consumer product environment, relating to high contact sports, how choice maximization positively influences better objective outcomes towards health risk assessment behaviors.

Third, the sports gear industry's excessive choice overload of sports products and information only adds to the frustration of decision making. For example, there is both high cost and volume of PPE equipment types available (Caswell et al., 2007; Pratt et al., 2019). We contribute and extend the choice difficulty and health risk assessment literature by introducing a novel boundary condition: health benefits of the product. In this vein, the research contributes to a noticeable lack of behavioral approach to sports injury prevention (McGlashan and Finch, 2010; Van Tiggelen et al., 2008) and choice overload and difficulty (Haynes, 2009; Scheibehenne et al., 2010; Chernev et al., 2015).

Fourth, we offer additional insight into why choice difficulty towards health risk assessment behaviors occurs by introducing another boundary condition: game-playing enjoyment. Specifically, in the context of high contact sports, we contribute and extend social marketing research, as it appeals to a wide variety of target audiences, including consumers, families, and retailers (van Esch, 2017; Duffy et al., 2020). Social marketing theory addresses athletes' self-esteem and self-actualization needs that directly relate to their motivation to pursue risky sports (Raggiotto et al., 2019). Therefore, this research's findings theoretically identify the extent to which game-playing enjoyment influences health risk assessments.

5.2. Managerial implications

This research offers several implications for marketers, consumers, psychologists, and retailers. Practically, the research finds that for marketers and retailers wanting to reduce consumers' choice difficulty, especially in order to increase the consumers' health risk assessment when it comes to wearing PPE in high contact sports, retailers and marketers must focus on the indirect effects of the product's health benefits, game-playing enjoyment, and an individual's choice maximization.

This study's findings illustrate how the thrill and enjoyment of the game impact consumers' objective health risk assessment about the sport and, consequently, could result in devastating outcomes (Thompson et al., 2009). Consumers can reduce their PPE purchasing difficulty by making informed decisions based on the product's health benefits (Van Tiggelen et al., 2008). Retailers can utilize the findings of this study to tailor their advertising messages in the light of challenging and adventurous contexts to satisfy athletes' game-playing enjoyment while emphasizing the positive health benefits of using PPE (Raggiotto et al., 2019), even utilizing scientific research about the same sports' performance (Rapisura et al., 2010).

Retail advertising and social marketing advertising must balance fear-inducing and beneficial product messaging because high contact sports have become extremely desirable, making it socially acceptable to adopt the risks involved (Fuller and Drawer, 2004). Therefore, retailers and marketers should not underestimate participants' emotional intelligence and expertise because as participants gain experience, their threshold of enjoyment for the sport increases. This threshold will then impact their health risk assessment, and it is harder for marketers to communicate the health benefits of the product and create a desire to purchase PPE. Research indicates that using self-reference as a tool to aid consumers in visualizing the benefits of a product will aid in the decision-making process (Dahl and Hoeffler, 2004). Consumers will be able to recognize the PPE that satisfies their needs without sacrificing their thrill-seeking behavior (Willemsen et al., 2016). Communicating the health benefits of the product will vary with the consumer's cognitive risk assessment in conceptualizing the alternative options available in the market (Vigo and Doan, 2015). Therefore, marketers should use creative advertising materials to elicit fear and alarm for the dangers of not using PPE, which will ultimately aid in consumers' decision-making (in making the optimal choice) (Dahl and Hoeffler, 2004).

In addition, to address choice difficulty and maximization, retailers should enhance the factors that enable people to choose PPE, such as fitting and wearing skills as well as the availability (i.e., of right sizes) and offer attractive discount options (Thompson et al., 2002). Also, access options can be reconsidered, such as partnering with sports clubs and associations. For example, providing financial and physical access has been an important consideration for many bicycle helmet programs (e.g., Kim et al., 1997; Logan et al., 1998).

6. Limitations and research directions

Our investigation featured a controlled experiment with online participants. Future studies should enhance our findings' robustness by employing replications in more controlled settings, using non-MTurk workers as participants, and/or incorporating neuroimaging evidence. Furthermore, another limitation of the study is that it is bound by the context of high contact sports. A future line of inquiry could explore a cross-cultural study with either amateur participants or professional participants or both as an opportunity to validate the findings of this research and explore other potential risk assessment behaviors. Continued investigations could compare respondents who wear PPE (vs. those who do not); such a comparison could yield interesting results as respondents might be more accepting of risk because wearing PPE makes them more invincible.

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