

Content Validation of a Recreational and Sport Risk-Taking Scale

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Abstract

Purpose: The practice of sport and leisure has many physiological and psychological benefits. However, certain behaviours may contravene the physical integrity and well-being of participants, notably through sports injuries. Several endogenous (sensation seeking, risk perception, psycho-affective aspects, substance consumption, age) and exogenous (social influence, recreational and sporting factors, protective equipment, physical environment) dimensions make up risk-taking behaviours. *Method:* A qualitative study helped in developing an explanatory risk-taking model. A scale, based on the results of this work, could serve as a useful tool to better understand the determinants of leisure risk-taking among young people and, thus, propose more relevant prevention measures. The purpose of our research is to precisely design and attest to the content validity of a scale based on measuring recreational and sport risk-taking factors among young people between the ages of fourteen and twenty-four years through a Delphi survey with experts (n=7) and two focus groups (n=12). *Results:* Our findings show that, after these two data collections, the questionnaire displays satisfactory content validity. Continued analysis of psychometric qualities will ensure construct validity and fidelity.

Keywords: Risk-taking, sport, leisure, youth

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Despite its many benefits for both physical and mental health (Doré et al., 2016), playing sports can lead to injuries. Adolescents (12 to 17-years-old) and young adults (18 to 24-years-old) appear to be injured more often than children, adults, and seniors (Hamel & Tremblay, 2012). Risk-taking is a factor in sports injuries and relates to human behavior (Shuman & Meyers, 2015). Recreational and sport risk-taking behaviours include specific elements: notions of choice, purposes of uncertain actions, thrill-seeking, and performance (Belley-Ranger, 2013).

Risk-taking behaviours represent a personal choice to engage in an action. Through these actions, people seek to experience strong emotions. Risk-taking's manifestations are widely varied, such as engaging in little-known terrain, disrespecting established rules, or increasing the level of difficulty, all to experience thrills or achieve a specific goal. However, sports injuries are the major consequence of risk-taking behaviours (Belley-Ranger, 2013, p.58).

It is relevant to distinguish between risk-taking behaviours and sports injuries. Whereas risk-taking behaviours rest within personal action, injuries represent a physiological and potential consequence of risk-taking behaviours. Thus, injury is due to a transfer of energy from an impact that cannot be tolerated by the human body (Tremblay, 2007). In the case of leisure and sport, the energy is mostly mechanical, which includes falls, collisions (with someone else, an object, or an environment), and thermal extremes (hypothermia). This energy could also be chemical, electrical or through radiation. The absence of vital elements (e.g., oxygen) also elicits injuries (World Health Organization, 2008).

We need tools that can measure risk-taking behaviours specific to leisure and sports that can consider a range of leisure and sports and are not only related to one discipline. Risk-taking behaviours must be considered in a broader set of recreational and sporting activities. The present study aims to validate a risk-taking, behaviour-measuring tool for use in various leisure and sport practices.

Literature Review

Risk-taking behaviours in leisure have been the subject of various studies, particularly regarding recreational and sports activities. The next section presents dimensions of recreational and sport risk-taking through existing tools in literature.

Dimensions of Recreational and Sport Risk-Taking

Two categories of recreational and sport risk-taking behavioural dimensions emerge from the literature: endogenous and exogenous (Belley-Ranger, Carbonneau & Trudeau, 2016). Whereas endogenous relates to the person, the exogenous refers to the person's environment.

Endogenous dimensions include sensation seeking, risk perception, substance-use, and age. Thrill-seeking is linked to risk-taking behaviours (Zuckerman, 2006) and sports injuries (Kern, Geneau, Laforest, Dumas, Tremblay, Goulet, Lepage & Barnett, 2014); these behaviours are documented among followers of alternative sports (Paquette, Lacourse, & Bergeron, 2009), such as skate-boarding (Kern et al., 2014). Substance consumption, which includes both performance-enhancing drugs forbidden by the World Anti-Doping Agency and legal substances (alcohol, caffeine, etc.), to improve sports performance is linked

to various sports practices (Valois et al., 2002). This consumption modulates decision-making by inhibiting judgment in risk-taking behaviours (Paquette et al., 2009). In addition, intensity and impulsivity partly explain the recreational use of illicit substances (cannabis, alcohol, ecstasy, cocaine, etc.), especially in alpine sports (Paquette et al., 2009). Teenagers are conducive to risk-taking behaviours (Kern et al., 2014) and risk-taking evolves with age, from adolescence to adulthood. While social influence (public, family, social networks) becomes less important over the years, from adolescence to adulthood, awareness of one's own vulnerability emerges during this period (Belley-Ranger & Carbonneau, 2014).

Exogenous dimensions combine social influence and recreational, as well as sporting, dimensions. Regarding social influence, studies conducted in the American football community highlight positive correlations between male norms and risk-taking behaviours (Steinfeldt et al., 2011). The propensity for risky maneuvers in the presence of peers further supports the role of peer influence in risk-taking behaviours (Paquette et al., 2009). Recreational and sporting dimensions refer to sport structures and sporting experiences. Sport structures correspond to the effects of sporting challenges, thus leading to the encouragement of athletes to play, despite injuries (Harringe, Lindblad & Werner, 2004) such as concussions (Mrazik et al., 2015). In addition, risk-taking behaviours seem to be influenced by the level of sport experience. Indeed, sport experience and the estimation of one's abilities directly correlate with risk-taking behaviours (Kern et al., 2014).

Thus, several studies have documented risk-taking behaviours in various, specific contexts (alpine sports, skate parks, etc.). In addition to these studies, it is important to consider to what extent existing tools allow, or do not account for, the multidimensional factors associated with this issue. To that end, the next section presents a portrait of existing tools.

Existing Tools

While a literature review shows that risk-taking behaviours in leisure have been the subject of several studies, the tools for measuring risk-taking remain limited, since they have been limited to only some forms of sport or leisure, such as adventure, extreme, or alpine sports. In other cases, literature explores risk-taking behaviours in general through thrill-seeking, but not as directly related to leisure and sport. Although several tools for measuring sensation-seeking exist in the current literature, they do not directly apply to recreational and sport risk-taking behaviours. Several tools evaluate thrill-seeking, including the best-known and pioneering text, "Sensation Seeking Scale" by M. Zuckerman (2006). Zuckerman focuses on assessing the propensity to seek novelty and sensations in various spheres by looking at four factors: thrill-seeking, experience searching, dis-inhibition, and boredom-sensitivity. Short or modified versions are based on these works: the French version of the Impulsivity SubScale (ImpSS) of the Zuckerman-Kuhlman Personality Questionnaire (ZKPQ) (Aluja, Rossier, García, Angleitner, Kuhlman, & Zuckerman, 2006), the Brief Sensation Seeking Scale (B-SSS) (Hoyle, Stephenson, Palmgreen, Lorch, & Donohew, 2002) and the French version of the Arnett Inventory of Sensation Seeking (AISS) Scale (Cazenave & Paquette, 2010). The ImpSS (validated in French) represents 1 of 5 sub-scales of the ZKPQ. This scale, validated in young adults ($M_{age} = 21.68$), is interesting, but only partially considers the construct of thrill-seeking by retaining only one of the impulsivity subscales. As with the B-SSS, this English-language tool has been translated and validated

in French among teenagers and young adults (Belley-Ranger, Carbonneau, & Trudeau, 2018). This scale includes 8 items and represents the four factors of thrill-seeking: the search for sensation and adventure, the quest for experience, disinhibition, and sensitivity to boredom (Zuckerman, 2006). The AISS has been translated and validated in French among university students in psychology and physical activity (Cazenave & Paquette, 2010). Although the tools identified here are relevant for sensory research, elements specific to recreational and sporting practice are necessary for a better understanding of the issue.

Other tools have been developed for conducting this research in recreational and sports activities. Such is the case with French adaptation of the Risk and Excitement Inventory (REI), which resulted in the *Inventaire du risque et de l'activation* (IRA) (Laffolie, LeScanff & Fontayne, 2008), the *Échelle de prise de risques en surf des neiges et en ski alpin* (RISSKI) (Paquette et al., 2009), and the Risk Taking Inventory (RTI) (Woodman, Barlow, Bandura, Hill, Kupciw, & MacGregor, 2013), which was adapted in French (Laffolie et al., 2008). IRA has been translated and validated in French by university students (Laffolie et al., 2008). It is specifically built to measure patterns of leakage and compensation for sensation seeking in other spheres of life, such as XXXX. RISSKI is built to evaluate recklessness, safe behaviour, and the consumption of psychotropics in snowboarding and alpine skiing (Paquette et al., 2009). This scale was validated in adolescents between 14 and 17-years-old. Finally, the *RTI* consists of two subscales, a risk-taking scale and a safe-behavioural scale, and has been validated for high-risk sports (skydiving, extreme skiing, climbing, etc.) (Woodman et al., 2013).

Since the tools previously presented struggle to connect to more global sports realities, we need to build and validate a measurement system that corresponds to our target population for three main reasons. Firstly, existing tools are exclusively concerned with either adulthood (Laffolie et al., 2008; Woodman et al., 2013) or adolescence (Paquette et al., 2009). Secondly, these measurement tools usually focus on a limited number of sports (Paquette et al., 2009; Woodman et al., 2013). Thirdly, the listed tools mainly deal with the psychological correlates of risk-taking or sensation seeking behaviours and do not deal with sport-specific elements that may exacerbate or promote risk-taking. The present research targets a wide range of sports disciplines and, therefore, requires a more comprehensive measurement tool. The absence of a measurement tool fully adapted to varied recreational and sporting practices thus guided our research approach.

Research Objectives

This study aims to:

1. Develop a generic recreational and sport risk-taking scale for 14 to 24-year-olds based on qualitative data from a prior study;
2. Examine content validity of the recreational and sport risk-taking scale.

Methods

Development and Validation of a Measurement Tool

The process of developing and validating a tool for measuring recreational and sport risk-taking is part of a wider research project. Prior to this approach, qualitative research among 45 men, aged 14 to 24-years-old, revealed risk-taking dimensions (Carbonneau et al., 2013). It is therefore necessary to garner knowledge of risk-taking in leisure and sports to develop and validate a quantitative tool for measuring the factors that lead to such risk-taking behaviours.

The validation process of the measurement tool follows steps proposed in the literature (Carpenter, 2018; DeVellis, 2012). DeVellis (2010) established steps for scale validation: 1) determining the phenomenon to be measured 2) creating a pool of items 3) choosing the measuring tool 4) evaluating items via an expert survey 5) including validation items 6) pre-testing 7) psychometric analysis of the measurement tool, and 8) optimizing measurement tool length. The purpose of this research is to verify content validity of the questionnaire, i.e., steps 1 through 5. Two data collections confirm content validity of the questionnaire, namely, a Delphi survey (2013-2014) and, subsequently, two focus groups (2015). The next section describes the methodology followed for each of these two methods. Steps 6 through 9 will be presented in a subsequent study. Carpenter (2018) published a methodological paper on scale validation, devised in ten steps; our study corresponds to the first step, which is “Research the intended meaning and breadth of the theoretical concept,” and more especially to the point referring to qualitative research (Carpenter, 2018, p.26). Through this process, items are generated and validated by experts and participants.

Delphi Survey:

A provisional questionnaire was developed by a team of two researchers based on data from qualitative research conducted upstream (Carbonneau et al., 2013). We used the theoretical foundations from the literature to support our methodology (Booto Ekionea et al., 2011; Hsu & Sandford, 2007, Okolo & Pawlowski, 2004). The Delphi survey was used to obtain consensus (Hsu & Sandford, 2007) around the developed measurement tool (Okoli & Pawlowski, 2004). This method employed iterations consisting of creating a committee of experts, who report their appreciation of measurement tool items on a Likert scale. Iterations allow experts to re-evaluate their initial assessment on items (Hsu & Sandford, 2007). This method, which emphasizes expertise and not representativeness, is appropriate for content validation (Booto Ekionea et al., 2011; Hsu & Sandford, 2007).

The expert survey, which took place between August 2013 and April 2014, required three rounds of analysis, as proposed by Booto Ekionea and colleagues (2011). Experts were asked to indicate their level of appreciation for each item in the questionnaire on a Likert scale ranging from 1 to 4 (“strongly disagree,” “somewhat disagree,” “somewhat in agreement,” “strongly agree”). The experts could also comment on items or suggest new items. At each consultation round, two people analyzed the assessments and comments received. Analysis combined qualitative and quantitative data, as suggested by Hsu and Sandford (2007). Quantitative analysis was realized using median and mode (Hsu & Sandford (2007). Once the questionnaire

was compiled, a new questionnaire version was developed and returned to the experts for the next round of consultation. After the third round, this process ended with consensus from the experts.

Focus Groups:

Subsequently, focus groups were designed to understand the extent to which the wording of the questions was appropriate for the target population of 14 to 24-year-olds. The focus group is relevant when using upstream for quantitative study (Geoffrion, 2009; Krueger & Casey, 2015) or in so-called evaluative research aimed at decision-making (Baribeau & Germain, 2010). As a result, the group interview consists of questionnaire pre-testing of both the item appreciation and the adaptation of item wording (Baribeau & Germain, 2010).

Two focus groups provided an understanding of items in the questionnaire for adolescents and young adults. The first focus group brought together high school students (n=7), while the second group involved post-secondary students (n=5), thus, respecting the suggested group size (Geoffrion, 2009; Krueger & Casey, 2015) and homogeneity of participants (Krueger & Casey, 2015). Participants in the first group were athletes in collective sports and participants of the second came from a leisure program and had experience as athletes. Participants were recruited by schools chosen for the study. In both group interviews, participants were asked to respond individually to the questionnaire. This part of the interview could be timed to estimate the duration required to answer the questionnaire. Subsequently, participants exchanged their understanding and perception of each questionnaire item. These meetings were then recorded and transcribed.

According to Krueger and Casey (2015), the conduct of the two focus groups followed the same process: 1) presentation of the research and its objectives 2) participants complete the survey, and 3) discussion on each item. This approach was useful to allow the participant to concretely experiment with the tool and to estimate the time required to complete the questionnaire. Afterward, questions were asked of participants based on their understanding of items. Once verbatim transcription was completed, research team analysis (facilitator, co-facilitator, and principal investigator) was completed to identify more problem items in the questionnaire. Changes to be made were agreed on by all research team members. In addition to the response from the risk-taking questionnaire (risk-taking dimensions and socio-demographic data), issues related to sensation seeking and sports-related consumption were included. Regarding thrill-seeking, two scales are administered, namely, the French version of the ImpSS (Aluja et al., 2006) and the AISS Scale (Arnett, 1994).

Results

The next section reports the results in three parts: findings from the Delphi survey, the focus groups, and final questionnaire presentation.

Delphi Survey

Sample Presentation:

Of the ten persons selected and contacted, seven participated in the expert survey. Below is the breakdown of experts involved in the approach by field of competence: five experts in research and higher education (physical activity (n=4) and psychology (n=1)), plus experts from school (principal) and the community (youth counsellors). Seven experts decided to collaborate in this study and all of them pursued their engagement until the end of the process.

Data Analysis:

The initial questionnaire included fifty-five items and twelve socio-demographic questions. Rounds of the Delphi survey did not generate new risk factors compared to the original questionnaire.

Analysis of the first-round results showed that, in contrast, the number of dimensions had decreased. Indeed, dimensions merged: 1) the risk perception with correlation to risk 2) reaction to injuries with the perception of injuries. The structure of the tool after this round of analysis remains unchanged in the following ways: physical environment, social influence, recreational and sporting factors, technological factors, risk perception, perception of injuries, individual preparation, and expectations of benefits.

First-round findings indicated that some changes might be necessary: ten items were added to the dimensions of physical environment (n=3), social influence (n=2), recreation and sport factors (n=3), individual preparation (n=1), and socio-demographics (n=1). Conversely, items were also subtracted from the questionnaire: recreational and sporting factors (n=1) and risk perception (n=1). At the end of the first round, the questionnaire presented sixty items on recreational and sport risk-taking, eleven socio-demographic questions, and an initial question (the most practiced leisure or sport).

Analysis of the second-round responses significantly reduced the number of problem items. Indeed, no items were excluded or moved from sections. However, two items were added to the socio-demographic questions. In the first round, 85% of the overall assessment of experts combined the categories “somewhat in agreement” and “strongly agree.” For the second round, this percentage of appreciation climbed to 94.75%.

The third round allowed us to specify the wording of four items and to add an item to the recreational and sport factors. Minor adjustments were made for items related to the following dimensions: social influence (n=1), technological aspects (n=1), risk perception (n=1), and individual preparation (n=1). Table 1 summarizes the changes in each round of analysis:

Dimensions discussed	Number of items after each round of analysis			
	Initial tool	1	2	3
Items				
● Included as is/unchanged	67	33	59	69
● Excluded		3		
● Re-stated		22	13	4
● Displaced		7		
● New		10	1	2

Table 1. *Summary of rounds of analysis of the Delphi survey*

Thus, the final questionnaire has a starting question, sixty-three items divided into eight risk factors and thirteen socio-demographic questions. Table 2 shows the composition of different versions of the questionnaire. Participants must answer the question: "Indicate to what extent each of the items applies to the way you practice your sport" on a 5-level Likert scale (none, very mild, mild, moderate, and totally). Response options specify degrees of agreement, and so the Likert scale is a common scale for measuring attitudes or beliefs (De Vellis, 2012).

Table 2. *Composition of different versions of the questionnaire*

Dimensions discussed	Initial tool	Second	Third	Final tool
First question		1	1	1
Physical environment	3	6	6	6
Social dimension	7	8	8	8
Recreational and sporting dimension	8	10	10	11
Technological dimension	5	5	5	5
Expectations and benefits	8	8	8	8
Risk perception	6	8	8	8
Injury perception	5	8	8	8
Reaction to injuries	3			
Individual preparation	6	7	7	7
Relation to the risk	4			

Contextual questions	12	11	12	13
Total	67	72	73	75

Focus Groups

Sample Characteristics:

Group interviews were held in February and March 2015 in the administrative region of Mauricie, Québec. The first interview brought together high school students (age 14 to 17-years-old) and the second interview assembled post-secondary students (age 18 to 23-years-old). As a result, the target population was well represented in terms of age. Male and female representation was equivalent for both focus groups. Participants practiced the sport chosen at the beginning of the questionnaire for about 8.5 years, on average ($SD=5.60$). Focus group participants reported the following injuries: sprains ($n=5$), tendinitis ($n=4$), stress fracture ($n=1$), concussion ($n=1$), and meniscus inflammation ($n=1$), breakdown ($n=3$), scratches ($n=3$), cuts ($n=2$), fracture ($n=1$), dislocation ($n=1$), and ligament tear ($n=1$). Participants completed the overall questionnaire within thirteen to nineteen minutes.

Data Analysis:

The changes reported are a combination of participant testimony and examination of the means and standard deviations (SD) of questionnaire items. As such, the addition of a “medium” response option and the modification of some questions with low SD made the questions more discriminating. For example, the item “My sport frees me from my frustrations” was rephrased as “My sport is the best way to free myself from my frustrations.” Participants reported that the 4-level scale was not sensitive enough. As Participant 4 remarked: “There is a big margin between ‘a little’ and ‘perfectly’.” Participant 6 wrote: “There is just a lack of ‘matches me,’ for example.” Some items were adjusted slightly for ease of understanding. Tables 3 and 4 lay out wording changes for the items involved; eighteen items had minor modifications and two items were added:

Table 3. *Summary of reformulations for certain risk-taking items*

Old formulation	New formulation
My sport is a passion for me	My sport is my main passion
My sport brings me pleasure	My sport is my main source of pleasure
I chose this sport to keep myself physically fit	I chose this sport first and foremost to keep me physically fit
My sport frees me from my frustrations	My sport is the best way to free myself from my frustrations
I search the company of others when I practice my sport	My first reason for doing this sport is to meet people
In general, I take risks elsewhere in my life (driving, school, etc.)	In general, I take risks elsewhere in my life (high speed driving, school, etc.)
Injuries are cured easily by medical advances	Injuries are easily cured by medicine
When I hurt myself, even seriously, I do not mind	I do not mind hurting myself badly
Before taking an action, I always evaluate my abilities according to the situation (terrain, traffic)	“Before doing an action, I always evaluate my abilities according to the situation”

Table 4. *Synthesis of reformulations for certain items of contextual and socio-demographic questions*

Old formulation	New formulation
Do you compete in a sport?	In which of these competition networks do you practice your sport? Choice of answer: No competition network (recreational) / Intramural sport (in your school) / Friendly league (outside school) / Student sport network / Civilian competition network
About how many times a week do you practice this sport?	About how many times a week did you practice this sport?
How long have you practiced every time?	And how long did you practice each time?
What is your skill level?	Additional answer choices: “beginner, beginner-intermediate, intermediate, intermediate-advanced, elite”
Which part(s) of the body did you hurt in the last 12 months?	Withdraw the answer choice: multiple parts
What type of health professional did you consult?	Added choice of answer: psychologist

What is the highest degree you have obtained?	Changes to answer options for: no diploma (DEP), High School Diploma (DES), Attestation of Collegial Studies (ACS), Diploma of College Studies (DEC), Undergraduate degree (certificate or diploma), University degree (master's or doctorate), Do not know and Not applicable.
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Additions	Add a question about email
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	Add a question about the school attended
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Some sub-scales, which were originally included to confirm construct validity in subsequent searches, had to be replaced. This was the case with a sensation-seeking scale and a consumption scale related to sports practice. The *AISS* Scale (Arnett, 1994) was withdrawn, given the discomfort of some respondents with the meaning of several items. Indeed, as Participant 5 mentioned: “what is the link with sport, it’s more extreme situations, war...?” Speaking about an item on their propensity to marry a person of another origin, Participant 2 testified: “...and with the choices we had, we had no choice but to be a bit racist.” Participant 1 went on to say that, in his view, not wanting to marry someone of another origin amounted to racism. Faced with these moral questions, largely transcending recreational and sporting practices, this sensation-search scale was removed from the questionnaire. When participants were asked about types of consumption related to recreational and sporting activities, some suggested energy drinks and steroids (Participants 6 and 7). Given these very relevant propositions, it was decided to modify this scale. The 3-item sub-scale (Paquette et al., 2009) used to verify sports-related consumption was removed for a more precise scale of 11 items, as inspired by the Valois, Buist, Goulet and Côté (2002) questionnaire. Changes to the latter scale consisted of grouping several items into categories to lighten the questionnaire and adding a question on energy drinks.

Final Version of the Recreational and Sport Risk-Taking Scale

The final measurement tool, resulting from the Delphi survey and focus groups, consisted of:

1. An introductory section: 4 items
2. A risk-taking section: 63 items and 8 dimensions
3. 5 Complementary sections:

- a. Consumption: 11 items
- b. Sensation seeking: 1 scale of 10 items and 1 scale of 8 items
- c. Sports practice (contextual issues): 5 items
- d. Sports injuries: 4 questions
- e. Socio-demographics: 7 items

Discussion

The purpose of this research was to design a recreational and sports risk-taking scale and to evaluate the content validity of items contained in the measurement tool. Its development was based on qualitative data from a preliminary study of forty-five adolescents and young men aged 14 to 24-years-old (Carbonneau et al., 2013). The present study thus made it possible to develop and validate the content of a tool for measuring risk-taking behaviours in sport and leisure, reflecting all endogenous and exogenous dimensions observed in this qualitative study. More specifically, content validity could be verified via a Delphi survey carried out by experts from various backgrounds (physical activity, school, and community involvement) and via two focus groups with the target population (high school and post-secondary students). The discussion is presented in three parts: methodology and scientific criteria, measurement tool structure, and research limitations.

Methodology and Scientific Criteria

The Delphi survey asked seven physical activity experts and the target population about their appraisal of items in the recreational and sport risk-taking tool. Moreover, the comments of experts and the possibility of adding items increased questionnaire validity (Okoli & Pawlowski, 2004). In total, three rounds of analysis made it possible to reach consensus among the experts. Regarding the experts interviewed, their number was small but acceptable (Krueger & Casey, 2015). Some authors suggested between seven and eighteen experts (Booto Ekionea et al., 2011) or ten to eighteen people (Okoli & Pawlowski, 2004). The small number of participants in both focus groups was needed to create a climate for discussion. Assessment on a scale of 1 to 4 and comments guided the research team in clarifying the wording of items. As a result, this method enhanced the quality of the measurement tool presented.

Focus groups allowed items to be reviewed directly with participants from the target population, as suggested in literature (Baribeau & Germain, 2010; Krueger & Casey, 2015; Carpenter, 2018). In addition, participants of the same age were gathered together to ensure everyone's involvement. Participants were asked to answer questionnaires and to share their appreciation of item wording, as proposed by Carpenter (2018). Modifications took place: two scales (thrill-seeking and consumption) were replaced by other scales, eighteen items were reformulated, and two items were added. Qualitative research is essential to the development and validation of a measurement tool, as accomplished through the involvement of several groups of participants (Carpenter, 2018; De Vellis, 2012). In this study, content validation by expert and youth feedback certainly contributed to item quality.

To meet the criteria of scientific research, four elements were considered: credibility, reliability, confirmation, and transferability (Lincoln & Guba, 1985). First, credibility refers to the accuracy potential of phenomenon description. This was reinforced by three elements 1) The questionnaire was constructed from a literature review and verbatim analysis of forty-five interviews with adolescents and young men aged 14 to 24-years-old, which provided a good understanding of the phenomenon 2) The data from the Delphi method was analyzed by two independent researchers at each Delphi round and the questionnaire for the next round of Delphi was based on consensus from these analyses 3) The involvement of three researchers in the focus groups analysis contribute to study credibility.

Secondly, as this questionnaire was subjected to a three-round Delphi survey and two focus groups, it possessed good reliability potential, given the breadth of the dataset. Subsequently, the confirmation criterion referred to objectivity and ensured that the results reflected participants' comments. Systematic rounds of analysis during the Delphi survey certified that analyses corresponded to what the experts said. In addition to multiple rounds, comments were returned for expert approval.

Finally, results transferability refers to the possibility of translating the findings into similar situations. Delphi survey methodology was followed closely; as with the focus groups, they were conducted in parallel and participants gathered in small groups, where they could express themselves regarding each question of the measurement tool. The structure of the meetings was identical for the two focus groups, so as not to bias the results.

Questionnaire Structure

The tool for measuring recreational and sport risk-taking behaviours encompasses a wider variety of sports than other questionnaires (Kern et al., 2014; Paquette et al., 2009). The preferred approach to risk-taking behaviours has the advantage of transcending conceptual limits of the study of risk-taking reserved for so-called "extreme" or emerging sports. Indeed, the concussion literature shows that many athletes hide concussion symptoms from the coaching staff or healthcare professionals to continue their sport involvement (Kerr et al., 2016; Mrazik et al., 2015). This applies to competitive practice and not to "extreme" physical activities. In contrast, such risk-taking behaviours refer to sports and recreation that are culturally well-organized in our society. Ignoring such symptoms is inherently a form of risk-taking. The composition of so-called endogenous (personal) and exogenous (environmental) dimensions is supported by a recently-published scoping review (Belley-Ranger et al., 2016), the Delphi survey, and two focus groups.

A section on the consumption of substances to increase sports performance is included in this scale. Given the fact that the questionnaire involves a wide variety of recreational and sporting activities, it is important to include a consumption sub-scale that reflects a broader set of substances. The scale included in the initial version of the measurement tool reflected the sporting reality of the reference study, namely, alpine skiers (Paquette et al., 2009). However, in the context of wider sporting practice, it is important to opt for a broader substances' consumption scale; this corroborates the choice of drawing inspiration from Valois and colleagues (2002). The one initially selected did not reflect the reality of respondents in focus group discussions. Consequently, a change to the scale and a modification that includes energy drinks became essential.

Two scales of sensation seeking were included in the initial questionnaire: the ImpSS (Aluja et al., 2006) and the AISS Scale (Arnett, 1994). The ImpSS was used in the study by Kern and colleagues (2014) and the AISS in the study by Paquette and colleagues (2009). Focus group results also supported the choice to include the ImpSS. As with the AISS, some items were imposing moral reflections that were too critical. This reinforces the relevance of focus groups for collecting assessments and comments from the target population (Baribeau & Germain, 2010; Geoffrion, 2009). The ImpSS and a French version of the B-SSS (Hoyle et al., 2002) included in the questionnaire reflect thrill-seeking, since both come from this work (Zuckerman, 2006). In subsequent research, these two scales of thrill-seeking will be mobilized to evaluate construct validity by linking them with risk-taking.

Sections of the measurement tool for recreation, sports and sports injuries consider more aspects related to leisure and sport than the questionnaires consulted, such as number of years of practice, frequency of practice, and level of self-reported skills. Thus, it will be possible to confirm or invalidate the results on competitive practice and the occurrence of sports injuries, as advanced in the literature (Pikora et al., 2011). The section on sports injuries is based on questions from a study of sport and recreational injuries commissioned by the Québec Direction de la promotion de la sécurité du Ministère de l'Éducation et de l'Enseignement supérieur (MEES) (Hamel & Tremblay, 2012; Tremblay, 2007). Therefore, during pre-testing of the measurement tool, the research team will be able to compare the data.

Research Limitations

This research has certain limitations. In focus group discussions, all participants practiced sports competitively or had some experience in competition, which led to sampling bias due to their point of view of engagement in competition that can module risk-taking. Two participants of the second focus group who had experience in competition continue their practice in a recreational way. Recreational practice is not well-represented by the sample; however, since generalization is not a criterion in this specific approach, it does not affect content validity. Nevertheless, considering both high school and post-secondary students reinforces the relevance of this study. Furthermore, participants are involved in seven individual and collective sports. Moreover, since development and validation of the recreational and sport risk-taking scale were carried out *in situ*, the scale remains contextual to sports practice and to young people between 14 and 24-years-old.

Conclusion

This work led to the development of a tool for assessing risk-taking that considers its multidimensional nature and can be applied in various sport contexts. The results of our study support the content validation of this measurement tool. Indeed, the measurement tool was developed from qualitative research conducted via semi-structured interviews (n=45). A Delphi survey and focus groups inevitably improved the quality of this scale. The development and validation of a tool for measuring recreational and sport risk-taking will not only deepen our knowledge of recreational and sport risk-taking behaviours but will also increase our understanding of youth and potentially develop more targeted prevention measures.

However, future research is warranted to validate the psychometric qualities and structure of this tool. Recreational and sport risk-taking profiles can then be drawn up based on the type of sport practiced (recreational, competitive, individual, and team-based) and this scale of measurement could then become an intervention tool to prevent risk-taking behaviours in recreational and sports practices. The scale of measurement developed and validated here thus refers to the notion of risk-taking, rather than to sports injuries, although these are included in the questionnaire for the sake of construct validity.

What Does This Article Add?

This article adds a recreational and sport risk-taking scale, which distinguishes itself through the following elements:

- Clientele of youth between the ages of 14 and 24 years;
- Generic type scale, which can apply to a wide variety of sports.

This article was the object of content validation by:

- Experts in the following domains (physical activity, psychology, school, community) via a Delphi method;
- Youth between the ages of 14 to 24-years-old practicing leisure and sport via 2 focus groups.

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