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Use of Psychological Skills by Risk Sport Athletes

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Abstract

Psychological skills can help athletes maximize their physical skills (Smith, Schutz, Smoll, & Ptacek, 1995) and overcome sport-related adversity. These skills may be especially beneficial to athletes performing within natural and unstable risk sport environments. The current study assessed psychological skills among risk sport athletes ($N = 232$) and the impact of experience on the use of such skills. Risk sport athletes of varying degrees of experience completed a modified version of the Athletic Coping Skills Inventory (ACSI; Smith et al., 1995). Risk sport athletes exceeded the midpoint on all of the ACSI subscales, indicating psychological skills usage. Experienced athletes scored significantly higher ($p < .05$) on three of the subscales and the total score, then leisure and novice athletes. These findings suggest the use of psychological skills within unpredictable and dynamic risk sport environments.

Keywords: psychological skills, risk sport, experience

Psychological skills have been known to increase a number of psychological variables (e.g., self-confidence, satisfaction, enjoyment) in athletes (Birrner & Morgan, 2010; Tod, Hardy, & Oliver, 2011). These skills include goal-setting, attentional focus, coping skills, and mental toughness among others. The use of these skills has been suggested to aid athletes in maximizing their physical skills (Smith et al., 1995) and obtaining an enhanced sport performance (Birrner & Morgan, 2010). Although these skills have been routinely examined in athletes from a myriad of traditional sports (Barwood, Dalzell, Datta, Thelwell, & Tipton, 2006), there has been a lack of attention towards athletes participating in risk sports (Sanchz, Boschker, & Llewellyn, 2010). Risk sports, which have also been labeled *extreme* or *lifestyle sports* (West & Allin, 2010), contain a continued threat of severe injury and in some cases can result in death via participation (Cogan & Brown, 1999; Kerr, 1991). As these sports occur in extreme natural environments which are inherently dangerous, one may deduce that employing psychological skills could aid in the preparation for risk sport participation by enhancing one's focus, concentration, and confidence. These skills may also enable risk sport athletes to engage in precautionary behavior by limiting the relative threat of risk, the result of which may be a superior and/or injury-free performance. Therefore, it is of particular interest to examine whether risk sport athletes regularly implements these skills. The purpose of the present study was to identify the degree to which risk sport athletes utilize psychological skills and the extent to which they are employed by those of varying degrees of experience.

Virtually all traditional sports (e.g., American football, ice hockey, rugby, gymnastics) contain risks. These risks, however, primarily consist of non-fatal sport-related injuries (Dekker, Kingma, Groothoff, Eisma, & Duis, 2000), while the actual incidence of death within these sports is relatively low (Cantu, 1996). American football, which is colloquially referred to as one of, if not the most dangerous American sports, averages 12 deaths per year (Boden, Breit, Beachler, Williams, & Mueller, 2013) or roughly one death per 120,000 participants (ncaa.org). In contrast, arousal-inducing risk sports (e.g., skydiving, rock climbing, wingsuit flying) maintain a constant threat of serious injury or fatality (Cogan & Brown, 1999; Kerr, 1991) and often require specialized equipment and/or training to successfully manage these threats (Fyff & Peter, 1997). Even with improvements in technology and safety equipment, the popular risk sport of skydiving still experienced 24 fatalities in the United States in 2013 (uspa.org) or just under one death per 1,000 jumps, while jumping from buildings, antennas, spans (i.e., structures), or earth-bound objects (i.e., BASE jumping) averages one death per 60 jumps (Monasterio, Mulder, & Frampton, 2012). With the ever increasing popularity and frequency of risk sport participation (Breivik, 2010; West & Allin, 2010), it is imperative for researchers to broaden their understanding of this particular population of athletes.

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The majority of literature regarding risk sport has concentrated on the personality traits of risk sport athletes and potential explanations for their willingness to accept the risks associated with these sports. Early investigations by Zuckerman (1983; 1990; 1994) shed light on the sensation- and arousal-inducing elements of risk sports suggesting that those high in the sensation-seeking trait attempt to reach their optimal level of arousal and need for stimulation via high-risk and extreme activities. Later inquiries (e.g., Goma-i-Freixanet, 1991) attempted to establish a working personality profile of risk sport athletes. Currently, risk sport athletes are characterized as individuals who are drawn to new and novel experiences, high in sensation and arousal seeking, and possess a heightened degree of situational-specific confidence in their ability to overcome sport-related adversity (Celsi, Rose, & Leigh, 1993; Diehm & Armatas, 2004; Llewellyn & Sanchez, 2008; Llewellyn, Sanchez, Asghar, & Jones, 2008). Recent investigations have explored the combination of personality traits such as extraversion, conscientiousness, and neuroticism (Castanier, Le Scanff, & Woodman, 2010), as well as harm avoidance, reward dependence, and self-directedness (Monastero et al., 2012), the impact of risk sport on the regulation of one's affect (Castanier, Le Scanff, & Woodman, 2011; Woodman, Cazenave, & Le Scanff, 2008), the connection with nature that participation in risk sport offers its athletes (Brymer, 2010; Varley, 2011), and the capacity to extend one's perception of control (Brymer, 2010). Woodman et al. (2013) have also recently added to the depth of knowledge regarding risk sport athletes by postulating a dichotomy of risk-taking behavior; deliberate risk-taking versus precautionary behavior.

As information regarding risk sport athletes continues to accumulate, it is important to examine how the use of psychological skills may be utilized within risk sport environments. Previous studies have investigated singular psychological skills, such as the use of imagery among rock climbers (Barton, 1996; Boyd & Munroe, 2003; Hardy & Callow, 1999; Jones, Mace, Bray, MacRae, & Stockbridge, 2002; Smyth & Walker, 1998) and skydivers (Fournier, Deremaux, & Bernier, 2008). Other studies have examined pre-performance psychological states (i.e., cognitive and somatic anxiety and positive and negative affect) and their effect on rock climbing performance (Sanchez et al., 2010) and the impact of severe weather conditions on high-altitude climbers' goal-setting and climbing experience (Bassi & Delle Fave, 2010). Additionally, overall mental strategies (e.g., imagery, goal-setting, mental toughness) among elite high-altitude climbers (Burke & Orlick, 2003), and general mental keys to success (e.g., pre-performance preparation, performance execution, post-performance reflection) used by big mountain freestyle skiers (Coleman & Orlick, 2006) have also been examined. However, to date, no study has attempted to construct a comprehensive assessment of risk sport athletes' usage of psychological

skills (Vealey, 2007) and/or the extent to which they are used by those of varying degrees of risk sport experience.

Similar to traditional sports, risk sports present unique physical challenges. Most risk sports require highly developed physical skills and detailed preparation to participate. For example, BASE jumpers typically undergo a rigorous apprenticeship which requires repeated and consistent training (e.g., practice of skydiving behavior, protocol, and technical interventions) and only the most experienced skydivers attempt wingsuit flying (i.e., using the human body and a specialized jumpsuit to fly through the air). It is also not uncommon for BASE jumpers and high-altitude climbers to plan for several years prior to their risk sport experience (Brymer, 2010).

In addition to the physical preparation needed to participate in risk sport, the development and use of psychological skills would seem to be advantageous to risk sport athletes. These skills could assist risk sport athletes with the management of the psychological demands that are often faced within unpredictable risk sport environments. Psychological skills could enable athletes to minimize and potentially control risk, as well as to effectively cope with the constant adversity, uncertainty, and in some cases the remoteness of their sport environment.

The psychological demands faced by risk sport athletes can range from heightened attentional focus (e.g., on technical motor movements, checking and inspecting equipment) and diligence (e.g., staying abreast of weather conditions), to the regulation of emotional states (e.g., nervousness, worry). One's confidence is also constantly challenged within risk sport. Risk sport athletes are often faced with trying never before attempted maneuvers and routines in dynamic environments (e.g., first decent on a mountain, challenging hold in climbing, hook turn in skydiving). Additionally, a certain degree of mental toughness is required when one willingly participates in a sport in which the consequence of failure can be fatal (Burke & Orlick, 2003).

Risk sport participation requires the ability to maintain composure in stressful situations (e.g., equipment failure, falling or loose rock), overcome adversity (e.g., fatigue, loss of focus), deal with emotional and physical discomfort (e.g., isolation, pain), persist in inclement conditions (e.g., avalanches, flooding, high winds, lack of oxygen), and cope with frightening situations (e.g., parachute not deploying). For example, high-altitude climbers have discussed the importance of reflecting on previous experience in order to acquire the mental strength needed to overcome adverse situations (Burke & Orlick, 2003). This is why risk sport athletes must partake in an honest and accurate evaluation of their personal capabilities, mental skills included, in addition to their technical expertise (Brymer & Oades, 2008). As risk sport environments are anything but predictable, the use of psychological skills may provide risk sport athletes with the mental tools necessary to overcome the unique demands of

their sport. Although research on the use of psychological skills within risk sport is scarce, the utility of such skills within traditional sport suggests a benefit of their use within risk sport.

Psychological skills have been shown to increase performance within traditional, non-arousal-inducing sport. However, to date, there has yet to be a comprehensive examination of the psychological skills used by athletes participating in a variety of arousal-inducing risk sports. In addition to the possible enhancement of performance, the use of psychological skills within risk sport may aid athletes in minimizing their risk of injury. The primary aim of the present study was to examine the types of psychological skills utilized by athletes among a variety of risk sports. A secondary aim was to identify the extent to which these skills are employed by risk sport athletes of varying degrees of experience. It was predicted that risk sport athletes would report a high degree of psychological skill usage, as compared to traditional sport athletes. It was also predicted that psychological skills usage would be more pronounced within more experienced risk sport athletes. Specifically, experienced risk sport athletes were anticipated to score higher on each of the subscales, as well as the total score, on a measure of psychological skills.

Method

Participants

Participants ($N = 229$) included males ($n = 123$) and females ($n = 106$) ranging in age from 18 to 66 years ($M = 27.1$, $SD = 9.98$). Participants were a purposive sample of risk sport athletes and were recruited on site at three locations (i.e., an outdoor recreation center, an indoor rock climbing facility, and an outdoor skateboard park) within a U.S. southeastern state. Flyers were also posted at these locations to recruit participants. The posted flyers provided a detailed description of the research topic, the eligibility requirements, and assessment tools to be used to collect the data. Recruitment also took place via two online social media websites (i.e., Facebook and Twitter). Based on participant responses to a specific risk sport experience item, participants were categorized as being *leisure* ($n = 35$), *novice* ($n = 38$), *moderately experienced* ($n = 47$), or *experienced* ($n = 109$) risk takers. Three participants did not report their degree of risk taking experience and one participant did not provide information regarding his or her sex; none of these participants were included in any of the data analyses.

Measures

Demographic and risk sport experience questionnaire

This questionnaire assessed participants' demographic characteristics such as age, sex, and the type of risk sports

engaged in. The experience component included one question that assessed the frequency of risk sport participation.

As the aim of the present study was to assess psychological skills use within risk sport participants of varying degrees of experience, it was important that all participants had a measurable amount experience. Although a criterion regarding experience within risk sports has yet to be formally operationalized within the literature, previous research (Cazenave, Le Scanff, & Woodman, 2007) has used frequency of participation as a discriminating factor between *leisure*, *novice*, and *experienced* risk takers. As such, the current criterion for risk sport experience was based on frequency of risk sport engagement. Participants reporting engagement for a period of less than one month were assigned the label of *leisure* risk takers, while those who had participated for at least one month, but no longer than one year, were assigned the label of *novice* risk takers. Participants with one to four years of experience were assigned the label of *moderately experienced* risk takers. Participants with at least five years of experience were assigned the label of *experienced* risk takers. Only participants meeting this criterion were included in data analyses.

Athletic Coping Skills Inventory-28 (ACSI-28) (Smith et al., 1995)

This inventory contains seven sport-specific subscales which are used to reflect a multidimensional construct of psychological skills. These subscales are: coping with adversity, peaking under pressure, goal-setting/mental preparation, concentration, freedom from worry, confidence and achievement motivation, and coachability. Each subscale contains four items, yielding a total of 28 items. The response format for each item consists of a four-point Likert-type scale ranging from 0 (*Almost never*) to 3 (*Almost always*). Six items are negatively worded, and thus are reverse scored. Each subscale can be utilized individually to assess specific coping skills or summed to indicate a global sense of psychological coping. Subscale scores range from 0 to 12, while total scores range from 0 to 84. Higher scores indicate an increased degree of psychological coping. Sample items from the ACSI-28 include "On a daily or weekly basis, I set very specific goals for myself that guide what I do" (goal-setting/mental preparation) and "I put a lot of pressure on myself by worrying how I will perform" (freedom from worry). Discriminant and convergent validity, as well as test-retest reliability have been reported for the ACSI (Smith et al., 1995). Additional studies using the ACSI (Goudas, Theodorakis, & Karamousalidis, 1998; Smith & Christensen, 1994) have indicated that it is reflective of psychological skills within both inexperienced and experienced athletes, as well as within athletes of various sports. A previous investigation utilizing the ACSI within Olympic champions (Gould, Dieffenbach, & Moffett, 2002) reported

scores on the seven subscales ranging from 8.2 (coping with adversity) to 9.9 (confidence), with an average subscale score of 9.19. Another study investigating professional minor league baseball players (Smith & Christensen, 1994) reported scores ranging from 6.56 (goal-setting/mental preparation) to 10.28 (coachability).

The current investigation used a modified version of the ACSI-28. Risk sports typically do not involve the use of coaches or managers. Thus, the four items related to coaching were excluded for the current study. Additionally, although risk sport athletes at times engage in competitions, there are rarely if ever *games*. Therefore, seven item stems were modified to be more reflective of participation and performance within risk sports. Item three was modified from “When I am playing sports, I can focus my attention and block out distractions” to “When I am *participating in my sport*, I can focus my attention and block out distractions”. Item four was modified from “I remain positive and enthusiastic during competition, no matter how badly things are going” to “I remain positive and enthusiastic *while participating*, no matter how badly things are going”. Item five was modified from “I tend to play better under pressure because I think more clearly” to “I tend to *perform* better under pressure because I think more clearly”. Item 11 was modified from “I set my own performance goals for each practice” to “I set my own performance goals *each time I participate in my sport*”. Item 12 was modified from “I don’t have to be pushed to practice or play hard; I give 100%” to “I don’t have to be pushed to *participate or go hard*; I give 100%”. Item 15 was modified from “The more pressure there is during a game, the more I enjoy it” to “The more pressure there is *while I am engaged in my sport*, the more I enjoy it”. Item 17 was modified from “I have my own game plan worked out in my head long before the game begins” to “I have my own *plan* worked out in my head long before *I begin to participate in my sport*”.

The final modified version of the ACSI-28 contained a total of 24 items. This modified version was used to create both a traditional paper version and an online version. The online version was made available to participants via direct contact with the researchers, through the use of flyers posted at the three physical recruitment areas, and via online social media websites. Cronbach alpha inter-item reliability scores for each of the six modified subscales were adequate, ranging from .61 to .79; the total-scale internal consistency was slightly higher ($\alpha = .84$).

Procedure

Participants who were recruited in person completed a questionnaire packet consisting of an informed consent document, the demographic and risk sport experience questionnaire, and the modified version of the ACSI-28. Participants who completed the questionnaire online were

first provided with the pertinent details of the study and an electronic version of the informed consent document. Upon receiving electronic consent, participants were then administered the questionnaire packet in the same order as those who completed the packet in person. All participants were provided with a standardized debriefing script and thanked for their participation.

Statistical Analysis

Frequencies were calculated for risk sports participated in, participant experience in risk sport, and the amount of risk sport participation reported per month. Descriptive statistics were calculated for participants’ scores, by experience level, on each of the ACSI’s six subscales, as well as the ACSI total-scale score. A MANOVA was conducted to assess differences in ACSI subscale and total-scale scores among the four risk sport experience levels. Tukey post-hoc multiple mean comparisons were also conducted to assess differences in scores among the experience levels.

Results

Descriptive Statistics

Participants reported experience within a variety of risk sports (see Table 1). The risk sports with the highest participation were mountain bike riding ($n = 137$), white water rafting ($n = 120$), and rock climbing ($n = 104$). Frequencies on participant experience in risk sport and risk sport participation per month are presented in Tables 2 and 3, respectively. Descriptive statistics on participants’ subscale and total-scale scores on the ACSI, by experience level, are presented in Table 4.

Effect of Experience on Psychological Skills Use

It was predicted that experienced risk sport athletes would report the highest scores on each of the six ACSI subscales. This prediction was partially confirmed. Results of the overall MANOVA indicated a significant effect of risk sport experience on ACSI subscale scores, $\Lambda = .85$, $F(18, 617) = 2.02$, $p < .01$, $\eta_p^2 = .05$. Specifically, there were significant differences among experience level within the coping with adversity, $F(3, 223) = 3.92$, $p < .01$, $\eta_p^2 = .05$, concentration, $F(3, 223) = 3.62$, $p < .01$, $\eta_p^2 = .05$, and freedom from worry, $F(3, 223) = 5.28$, $p < .01$, $\eta_p^2 = .07$, subscales. Tukey post-hoc analyses indicated that experienced athletes scored significantly higher than both leisure ($p < .04$) and novice ($p < .04$) athletes within the coping with adversity subscale. Additionally, experienced athletes scored significantly higher than leisure athletes ($p < .03$) within the concentration subscale. Finally, experienced athletes scored higher than both leisure ($p < .05$) and novice ($p < .01$) athletes within the freedom from worry subscale.

Table 1
Descriptive statistics for risk sport participation.

Risk Sport	Participant Experience
Mountain bike riding	137
White water rafting	120
Kayaking	113
Rock climbing	104
Surfing	82
Snowboarding	81
Dirt bike riding	78
Skateboarding	72
Wake boarding	72
Scuba diving	67
Parachuting	61
Skydiving	53
Wingsuit flying	52
Cliff jumping	47
In-line skating	45
Other	45
Parasailing	37
High diving	33
Bungee-jumping	29
Deep sea diving	29
BMX	28
Bicycle stunt riding	22
High-altitude climbing	21
Hang-gliding	13

It was also predicted that experienced risk sport athletes would score the highest on the ACSI total scale. This prediction was partially confirmed. Results of the MANOVA indicated significant differences on the ACSI total-scale score among the experience levels, $F(3, 223) = 4.09, p < .01, \eta_p^2 = .05$, with experienced athletes scoring the highest (see Table 4). However, results of the Tukey post-hoc analysis indicated that significant differences in total score were only observed between experienced and novice athletes ($p < .01$). No significant differences were observed between either the experienced and leisure athletes ($p = .07$), or the experienced and moderately experienced athletes ($p = .67$).

Discussion

Previous investigations have explored the use of singular psychological skills (e.g., imagery, mental toughness) within risk sport athletes. No study, however, has attempted to explore the usage of a constellation of psychological skills within this population. Thus, the primary aim of the

Table 2
Experience in risk sport.

	<i>n</i>	Percentage	Cumulative Percentage
Leisure	35	15.30	15.30
Novice	38	16.60	31.90
Moderate	47	20.50	52.40
Experienced	109	47.60	100.00
Total	229		

Table 3
Risk sport frequency per month.

	Frequency	Percentage	Cumulative Percentage
1 day	59	25.40	25.40
2–3 days	36	15.50	40.90
4–5 days	37	15.90	56.80
5–10 days	29	12.50	69.30
11–15 days	18	7.80	77.10
16–20 days	22	9.50	86.60
21 or more days	26	11.20	97.80

present study was to identify the extent to which several psychological skills (i.e., coping with adversity, concentration, confidence and motivation, goal-setting and mental preparation, peaking under pressure, and freedom from worry) are utilized among risk sport athletes. An additional aim was to explore how the use of these psychological skills varies as a function of risk sport experience.

As psychological skills have been reported not only to increase sport ability, but also to enhance sport performance within traditional sport (Birrer & Morgan, 2010; Smith et al., 1995), it was believed that the current sample of risk sport athletes would also report the usage of such skills. This prediction was confirmed, as all risk sport athletes reported using the psychological skills represented by the ACSI. Additionally, the range of scores obtained in this sample is similar to those from traditional sport (i.e., baseball) (Smith & Christensen, 1994) and slightly under that reported from Olympic champions (Gould et al., 2002). Specifically, the athletes sampled scored above the midpoint on each of the six subscales of the ACSI, suggesting that those involved with risk sports utilize psychological skills.

The knowledge of and implementation of psychological skills, however, are typically associated with more experienced athletes. Thus, it was also predicted that the most experienced risk sport athletes would report the highest usage of psychological skills among the four risk sport experience levels. This prediction was partially confirmed, as experienced athletes did report the highest degree of usage on five of the six ACSI subscales, as well as the ACSI total-scale score. More specifically, experienced athletes reported significantly higher scores on the subscales representing coping with adversity, concentration, and freedom from worry. As such, it appears that psychological skills are not only employed by risk sport athletes, but that these skills tend to increase in usage as one's experience in risk sport intensifies.

Possessing the psychological skills necessary to cope, concentrate, maintain confidence, self-motivate, employ goal-setting, mentally prepare, and be free from worry provides athletes with the resources necessary to be successful in sport. This is especially true when attempting to navigate unpredictable and adverse sport environments. Risk sport athletes are constantly faced with challenges. These include, but are surely not limited to, managing

Table 4
ACSI by subscale and experience level.

	Leisure		Novice		Moderately Experienced		Experienced		Total	
	(n = 35)		(n = 38)		(n = 46)		(n = 109)		(N = 229)	
	M	SD	M	SD	M	SD	M	SD	M	SD
Coping with adversity	7.26*	2.75	7.29*	2.23	7.91	2.27	8.44	2.08	7.96	2.30
Peaking under pressure	6.69	2.63	6.95	2.72	7.57	2.88	7.58	2.57	7.33	2.68
Goal-setting/mental preparation	7.49	2.94	6.79	2.80	6.63	2.69	6.44	2.82	6.70	2.81
Concentration	7.43*	2.68	7.68	1.63	8.11	2.42	8.62	1.99	8.19	2.19
Freedom from worry	6.14*	2.79	5.74*	3.11	7.30	2.67	7.60	2.87	7.00	2.94
Confidence/motivation	8.23	2.38	7.95	2.01	8.20	2.04	8.81	2.00	8.45	2.08
Total score	43.23	10.71	42.39*	8.74	45.72	10.35	47.50	7.64	45.63	9.11

Subscale scores range from 0 to 12. Total score ranges from 0 to 72.

*Significantly lower than Experienced, $p < .05$.

physical and/or mental fatigue and maintaining composure when in isolation. Other challenges risk sport athletes commonly face are enduring the stress associated with equipment failure and constantly changing weather conditions. Additionally, unlike traditional sport, when technical and tactical errors are made in a risk sport environment the consequences often result in injury, and sometimes can lead to death. Thus, these psychological skills may be considered a form of precautionary behavior, which prepare risk sport athletes for future adversity and provide them with resources to aid them in effectively executing their sport tasks.

However, as noted, these results suggest that psychological skills use in risk sport is in part reflective of experience. For the inexperienced novice, these sports may still be viewed primarily as a means to obtain the heightened physiological sensations that are inherent within these sports. As Woodman et al. (2013) have suggested, these types of risk sport athletes may deliberately seek out the risk inherent in risk sport. As such, successful task execution and skill advancement may not yet be an area of concern or an intended outcome for the leisure or novice risk sport athlete. If this is indeed the case, then it is possible that these athletes may not see the benefit that psychological skills may afford them, in terms of preparation and the management of risk, nor see the need to implement them.

Experienced athletes, however, have undoubtedly dealt with adversity and, more than likely, serious threats to their safety. Successful experiences in these types of situations, as well as unsuccessful attempts in less risky situations, can lead to the accumulation of knowledge and an awareness of the usefulness of psychological skills in preparing for or overcoming extreme conditions. Additionally, as the motivation for skill advancement and the desire to challenge one's self in risk sport increases, the utility of coping, concentration, and overall mental preparedness is likely to become more salient within the athlete. This may in turn lead to a more precautionary approach to the risk

sport domain. One in which the athlete can focus on task execution and goal attainment, while still experiencing the arousal inherent in the sport. Therefore, the usage of psychological skills may be viewed by the more experienced risk sport athlete as an important complement to the technical, tactical, and physical abilities already employed by him or her.

The results of the present study provide confirmatory evidence that risk sport athletes utilize psychological skills when engaged in their sport. It also provides preliminary evidence that these skills increase as a function of risk sport experience. Although specific explanations for the usage of these skills was not assessed within the current study, these results do suggest that skills such as the ability to cope, concentrate, and mentally prepare among others are resources that risk sport athletes implement to some degree. As the nature of risk sport is one that is inherently unpredictable and at times significantly hazardous to one's safety, one may postulate that these skills enable risk sport athletes to enjoy the arousal-inducing elements of their sport with the understanding that when, and not if, something does go wrong, they possess the psychological resources necessary to help them successfully overcome them.

Limitations and Future Directions

The most significant limitation of the current study is that it did not attempt to manipulate or control psychological skills use to explore the causal effects of them on any type of risk sport task. As previously acknowledged, the aim was to acquire descriptive data on psychological skills use within a population of athletes that had yet to be comprehensively explored. Therefore, any potential explanation as to the reason for which these skills are implemented must be interpreted cautiously.

Another limitation regards the use of the ACSI as an assessment of psychological skills use. Although the ACSI

has been used in previous studies to assess psychological skills (e.g., in Olympic champions, baseball players, etc.) and does measure a variety of psychological skills, it does not assess all potentially relevant psychological skills. For example, the assessment of imagery, self-talk, and arousal-regulation is not included within the ACSI. These skills have been routinely measured in athletes from traditional sports, and based on the results of the current study, would seem plausible to exist within risk sport athletes. Therefore, the use of the ACSI in the current study limits the breadth of knowledge that may exist regarding the types of psychological skills used by risk sport athletes.

Finally, the total number of athletes assessed and means of assessment could be viewed as limitations. Although a sample of over 200 athletes is noteworthy, a larger sampling of risk sport athletes would help to solidify the extent to which psychological skills are employed. Additionally, this sample was only assessed via self-report quantitative methods. A qualitative investigation into the frequency and utility of psychological skills could provide a more in-depth understanding of the role that psychological skills may play within risk sport.

Future investigations into the use of psychological skills by risk sport athletes should attempt to employ a measure, or series of measures, that will adequately assess all psychological skills. It is also recommended that researchers consider adding a qualitative aspect to any future investigation into psychological skills use by risk sport athletes. Finally, researchers should also consider assessing the direct impact of psychological skills use on risk sport task completion.

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