

Risk Taking Behaviour as a Cause of Drowning after Engagement in Swimming & Non-Aquatic Activities

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Context: According to the 4W model one of the key factors of drowning is the casualty characteristics (Avramidis, Butterly, Llewellyn, 2007). The aim of the study was to identify if risk taking behaviour can lead to drowning after engagement in swimming and non-aquatic activities. **Methods:** Qualitative content analysis (QSR, 2002) of drowning incident videos (n = 41), and semi-structured interviews of those involved in drowning incidents (n = 34) followed by the measurement of frequencies and Boolean search with matrix intersection was conducted.

Results/Discussion: Risk-taking behaviour was the cause of drowning in relatively few aquatic accidents (11, 15%). Sensation seekers were willing to take risks that involved psychological anxiety (7, 9%) for satisfying their need (e.g. illegal bungee jump and parachute jump from high bridges etc.) (Franken et al., 1992).

Learning Outcomes:

1. People behave riskily while engaged in activities perceived as controllable by themselves and recognized as risky by others.
2. High sensation seekers are unrealistically optimistic, take risks voluntarily for satisfying their needs, view the world as less threatening and fearful, expect that the outcome would be less negative, and are likely to report a lifetime history of antisocial behaviour.
3. Risk taking behaviour can lead to drowning.

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Why do people risk their health or life in an aquatic area? The concept of risk is relevant to anyone who makes decisions in life, from holiday makers to athletes, from parents to adolescents. Viewed from a certain perspective every human activity can be seen to contain risk (Franken, 1998), and risk taking behaviour can be seen as a central facet of human information processing and part of the larger fields of cognition, personality, motivational and social psychology (Tenenbaum, 1995). The reasons for avoiding risk are obvious, but why do some people seek experiences that contain potentially fatal risks? After centuries of concerns and empirical scrutiny, very little is known about the meanings implicit in risk behaviours (Lightfoot, 1997). Researchers have stressed both the theoretical and practical importance of this area in being able to understand risk taking behaviour, and to modify the willingness or direction of risk taking behaviour (Cronin, 1991; Lightfoot, 1997; Slinger & Rudestam, 1997).

Eighty to 95% of all on site accidents are triggered by unsafe behaviour and people behave unsafely because (Construction Industry Training Board, 2002):

1. They have never been hurt, and so, they were lucky. Lack of any injuries is rewarding the person's unsafe behaviour. Behaviour that is rewarded by a lack of punishment or injury tends to be repeated;
2. They ignore training, safety rules, signs and precautions;
3. They honestly think that this is the only way of doing a specific activity;
4. They believe that nothing will even happen, expecting misfortunes happening to others.
5. They decide that is better to risk failing than to avoid trying when the consequences are less aversive.

This question of 'Why do people take risks in, on, under or near the aquatic environment?' has been approached from several viewpoints, but not from a psychological perspective. The 'Adventures Model' suggested that as experience with risk recreational activities increased, there was an increase in expertise and frequency of participation. Locus of control therefore, moved from external to internal and motivation factors became challenge, achievement and risk taking. This was due to an increase in the level of engagement from the stage of 'introduction' to 'development' up to the stage of 'commitment' (Ewert & Hollenurst, 1989). However, the failure to substantiate the predicted motivational shift of this model was due to the inadequate specification of the levels of engagement (Mc Intire, 1992). Some people reveal that risky activity is triggered because adventure is rewarding, exciting, fun and exhilarating (Miles & Priest, 1990).

Studies that involved risk takers have shown that hormones (norepinephrine and epinephrine) are released during risky activities (Zuckerman, 1979). Thrill-seeking activities require a certain level of ability and skills. Risk takers make use of fear to trigger arousal getting psychological pleasure. As they are usually highly skilled people, they don't actually experience high level of fear. While they behave riskily getting involved in an activity that requires developed coping skills in the face of uncertainty, they feel self-satisfaction (Franken, 1998).

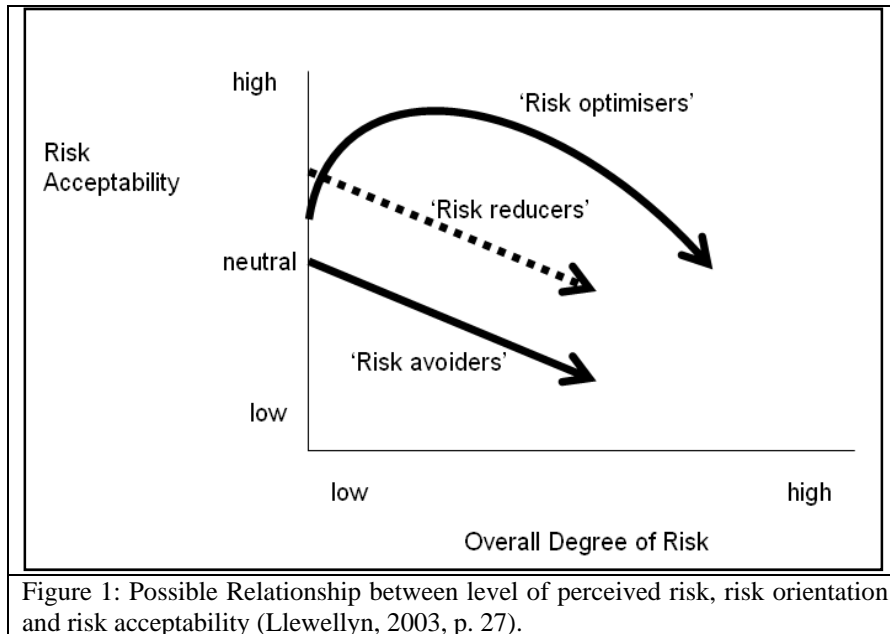
Psychoanalysts initially proposed that risk takers were illogical, or even pathological. However, after fifty years of intensive research these individuals would now be classified as high "Sensation Seekers" (Llewellyn, 2003). Slanger & Rudestam (1997) asked why some people are willing to take risks in certain areas of their lives and not others. The answer might be simply because people may lack the opportunity to participate in certain activities due to financial difficulties, and so they possibly try to find different behavioural expressions for the same needs. Lastly, other variables (such as additional personality traits) may predispose people to take certain kinds of risk, for example people who are low in Neuroticism may be more likely to become parachutists than drug users. Although it can confidently be said that risk takers are possibly Sensation Seekers, the future research of risk taking behaviour must take into account the possible role of additional variables that may progress our understanding beyond Sensation Seeking (Llewellyn, 2003).

What is Risk?

'Risk is sometimes seen as the probability of an unwanted event occurring. However, here risk is taken to mean the probability of an unwanted event occurring and the severity of potential loss. Risks exist because things considered to have value are placed at risk, and as such the nature of risk concerns the interaction of people in their environment. Some risks are the result of peoples' behaviours, and risks vary in the degree that they can be controlled by their actions. The concept of risk is sometimes said to incorporate the possibility of gain. Nevertheless, it is difficult to see how this constitutes an essential addition, although this might serve as a useful reminder that situations that contain risk may also contain opportunities for achievement' (Llewellyn, 2003; p. 27).

Risk Taking Behaviour

In order to consider behaviour as risk taking, it must meet two components; a volitional quality to and an uncertain outcome from the behaviour. By definition, risk taking behaviour must have either a potential outcome without injuries or may result in harm (Irwin, 1989). According to other source, risk taking behaviour is the voluntary participation in behaviours that contain, or seen to contain, a significant degree of risk. There are three different risk taking types, namely "risk avoiders" (who avoid activities due to the risks involved), "risk reducers" (who participate in high risk activities in spite of the risks involved), and "risk optimizers" (who participate in high risk activities partly because of the risks involved) (figure 1).



There are five main features of risk taking behaviours (Llewellyn, 2003, p. 137):

1. "Risk taking" may be conceptualised as a personality trait expressed through the participation in behaviours that contain a significant degree of risk.
2. "Significant" physical risk behaviour can be defined as behaviour that entails a relatively high probability that something serious will happen (e.g. injury or death).
3. Risk taking is a matter of degree, a continuum rather than a dichotomy. From a different perspective everyone is a risk taker, admittedly to differing degrees. Risk taking behaviours must be voluntarily engaged in.
4. People take differing risks in different aspects of their lives, further research is needed to examine whether risk taking behaviours generalise to the degree that they can be treated as being functionally equivalent in psychological terms.

Psychological Profile of High Risk Sports

According to Llewellyn, (2003) sporting risk takers tend to be very confident that they can manage the risks involved, and have friends that also choose to take potentially life threatening risks. They are willing to take physical risks in order to trigger the 'fight or flight' response, as they believe themselves to be in control of the risks, they experience this high arousal as excitement rather than fear. This gives them feelings of satisfaction derived from the exercise of control in dangerous circumstances that they perceive to be challenging rather than threatening. The same author argues that risky situations that do not involve a large degree of personal control (e.g. Russian roulette), are unlikely to appeal to this kind of risk taker. Dangerous activities are sought when the reward outweighs the punishment and when risk sport activity provides intrinsically rewarding experience that is unique to the particular form of sport activity (Cogan, 1999). People of this category are more likely to be male, and may be low in neuroticism suggesting resilience to adverse stimuli and low in anxiety which may partially explain their self-confidence. The motto of a sporting risk taker might be "who dares wins". If the risk taking sports participant has to be described in a sentence, one might say that they were a confident and physically adventurous risk

taker motivated by sensation seeking and mastery needs. This profile accounts for around 60% of the participation in high risk sports (Llewellyn, 2003). High sensation seekers (n=335) are more likely to report both a lifetime history and family history of antisocial personality, attention deficit disorder and conduct disorder (Ball, Carroll & Rounsaville, 1994).

Antisocial Risk Taking Profile

Antisocial personality might lead to drowning through health risk taking or antisocial risk taking behaviour such as alcohol consumption. In fact many drowning victims were found to be drunk (Eaton, 1995; Bierens et al., 1996; Mackie, 1999; Smith et al., 2001). One explanation behind this might be that people perceive risky activities as being less dangerous when intoxicated than when sober. To the extent that alcohol intoxication or other drug effects reduce the belief that negative consequences will take part, it seems reasonable to expect an increase in risk taking behaviour (Fromme, Katz & D'Amico, 1997). However according to Lightfoot (1997) many studies indicate that adolescents are well aware that their risk behaviour is indeed risky and it is very different from the decision-making processes of adults regarding alcohol, reckless driving and drags. Therefore there is a gap in our understanding about why young people choose to take risks when they are drunk while they know that it is dangerous. The gap becomes even wider considering the 'content' of the risk. Everybody agrees that alcohol impairment is risky during driving but without saying who is in danger. Males are more likely to have driven having taken alcohol or narcotics, while females are likely to have ridden a car with an intoxicated driver (Millstein & Irwin 1987 as cited in Lightfoot, 1997). Although there is no later reference for the above fact in order to understand what is happening in our today's society between males and females, this finding of Millstein and Irwin's explains that both are risk taking behaviours.

Sensation Seeking and Perceptions of Fear, Risk Taking and Danger

Given the facts that danger is related to fear, and fear is considered to be the motivation for avoidance behaviour, it is difficult to understand why some people seek confrontations with danger (Piët, 1987). As mentioned previously, risk taking behaviour has been closely related with sensation seeking. According to Zuckerman (1979) sensation seeking is 'the need for varied and complex experiences and the willingness to take physical and psychological risks for the sake of those experiences'. A risk taking activity, contains anxiety, fear, and danger, and if sensation seekers are willing to take risks for satisfying their need, it is because they view the world as less threatening and fearful (compared to low sensation seekers), and therefore, they expect that the outcome of their risk taking behaviour is less negative (Franken et al., 1992). According to another belief, individuals can enjoy the danger in risky activities as pleasant if there is a necessary preparation that will allow them to have a personal control in the risk taking. This is called 'phenomenological or protective frames' (Apter, 1982). In contrast, for those people in whom that the so-called protective frame is not operative, every risk taking activity possibly can provoke fear and anxiety (Trimpop et al., 1999). On the other hand, if high sensation seekers are not as anxious as low sensation seekers in situations that contain fear, risk and danger, because of the activation of norepinephrine, then they perceive the activities where they are engaged to as fearful, without risk or danger (Franken et al., 1992).

As mentioned earlier, individuals are more likely to take risks in a voluntary activity (Hewitt et al., 1995). High sensation seekers who are engaged freely in some activities don't perceive the world as threatening as low sensation seekers and they will incline to alter beliefs that these activities are perceived in the future as health or life threatening. However, high sensation seekers will have to deal at some point with other people who perceive the same activities as dangerous, risky and life threatening (Franken et al., 1992). These people could be the lifeguards for example who are responsible for preventing dangerous and risky situations. It can also be the regulations, the flags or the warning signs that prohibit given behaviours in, on, under or around the aquatic environment. According to Franken et al., (1992) high sensation seekers will ignore or disregard this information that isn't consistent with their behaviours because this is the only way of dealing with the discrepancy between their behaviour and the perceptions of those other people.

Studies involving identical twins who are reared apart suggest that a large proportion of Sensation Seeking is genetically determined (Zuckerman, 1994). On average men tend to be higher in Sensation Seeking than women (Zuckerman, 1994; Kohler, 1996). Sensation Seeking tends to decline with age (Zuckerman, 1994). This might partially explain why many people who take potentially fatal risks are young men. However it should be borne in mind that many women are high Sensation Seekers, and an increasing number of women participate in high risk sports (Llewellyn, 2003).

Many people become addicted to danger because they feel most alive when they challenge themselves by confronting dangers (Garbarino, Kostelny & Dubrow, 1991). A risky behaviour, however, is not an effective symbol unless it is recognized as risky by other people. Therefore, part of the problem of risk taking behaviour relies on the relationship between individuals and their social groups, that is the relational context in which a person's action (e.g. someone goes scuba diving or sailing alone in rough weather) have meaning (Lightfoot, 1997).

Research studies reveal that people behave riskily around aquatic environments, and a more detailed understanding of risk taking behaviours is vital for the water safety of the community, as these behaviours can tell us much about decision-making under conditions of uncertainty (Llewellyn, 2003). Knowing how people behave in certain activities, will enable us to understand and/or identify the risk-takers, what triggers this behaviour and therefore, to reduce the likelihood of drowning. As people tend to blame others for threatening events, a lifeguard may be held responsible for a drowning without being its cause (Tenner & Affleck, 1990). Effective understanding of what motivates people to take different kinds of risk may allow the early identification of 'at risk' individuals (Lightfoot, 1997; Scott & Spencer, 1998). In other words, lifeguards might be able to 'recognize' and prevent a particular set of behaviours or individual differences that predict potentially risk taking behaviour in a guarded aquatic environment.

Aim

According to the 4W model when there is human activity in, above or around an aquatic environment a drowning incident might happen to whomever and under whatever circumstances. One of the key factors of drowning is the casualty characteristics (Avramidis, Butterly & Llewellyn, 2007). The aim of the present

research was to identify if risk taking behaviour can lead to drowning. Two studies were therefore undertaken to investigate who is likely to drown.

Study 1 Methods

Participants

A criterion sampling method (Patton, 1990) was used to obtain drowning incident videos ($n = 41$) from a wide variety of sources. More precisely the study used 18 rescues from the videocassette 'On drowning', (1970), 3 rescues from the video cassette 'The history of RNLI', (1994), 5 rescues from the videocassette 'Great Survivors; Witness Events of the 20th Century', (1998), 2 rescues from the TV program 'Animal Heroes; Real Life Rescues', (2001), 7 rescues from the TV program 'When stands go wrong', (2001), one rescue from the TV program '999', (2000), and 5 rescues from various TV night newscasts (Batavanos, 2002; Children near drown in a frozen lake, 2001; Drowning in Patra, 2001; Near drowning of family in Indianapolis, 2001; Stowaways drown in river Rio Bravo, 2002). These visual narratives ranged from 30 to 720 seconds ($M = 345.0$ secs, $SD = 2.8$).

Apparatus

Videos were observed using a JVC television (CM31720-003) and a Panasonic video cassette recorder (AG-MD830).

Procedures

Videos were observed and data inputted into NVIVO software (QSR, 2002) for qualitative analysis. A content analysis was conducted following the methodological procedures recommended by others (Booth, 1998; Gratton & Jones, 2004; Rich & Chalfen, 1999). Coding stripes and the node browser enabled the visual identification of differently coded sections and the internal comparison of all data that were similarly coded. Frequencies were measured and Boolean search with matrix intersection identified the dominant linkages between the four variable factors thought to contribute to drowning incidents.

Study 2 Methods

Participants

Thirty male participants (aged 16 to 65 years, $M = 28.4$, $SD = 11.3$) and four female participants (aged 19 to 65 years, $M = 37.5$, $SD = 19.5$) were water safety professionals (lifeguards, lifesavers, scuba divers and athletes of aquatic sports) from Greece ($n = 25$, 71.4%), UK ($n = 2$, 5.7%), USA ($n = 1$, 2.8%), and Cyprus ($n = 6$, 17.1%). Participants were selected if they were capable of describing a drowning-related incident above the surface of the sea ($n = 23$, 67.6%), under the surface of the sea ($n = 5$, 14.7%), in a lake ($n = 2$, 5.9%), or in swimming pool and waterpark ($n = 4$, 11.8%).

Apparatus

A SANYO M-1110C audio tape recorder and 2-hour Maxell cassettes were used to record the interviews.

Procedures

Institutional ethical approval was first obtained to conduct semi-structured interviews investigating the factors involved in drowning incidents. A mix of convenience and snowball sampling methods was used in the present study to locate information-rich key informants and critical cases (Patton, 1990). An information sheet was distributed to potential participants prior to the interview explaining the nature and objectives of the study, and voluntary informed consent was obtained (Gratton & Jones, 2004). Interviews were conducted using a semi-structured interview schedule, which included points relating to each of the four factors of interest (i.e. the rescuer, the casualty, the location and circumstances). Confidentiality and anonymity were maintained throughout, and individuals were not identifiable from the raw data (Patton, 1990). Data was transcribed and inserted into NVIVO for indexing and qualitative content analysis (Wengraf, 2001); the procedures adopted were consistent with those utilized in study 1. All hardcopies were kept in a locked cabinet, and electronic data was password protected.

Results

Risk taking behaviour was found in the sample both studies in one out of four cases (9, 26.5%). In two cases risk taking behaviour led to drowning fortunately with favourable outcome. In the first a stunt man attempted a base jump of the 746 foot high way North tower of the Golden Gate Bridge. During the jump shifting winds slammed him into the side of the tower. The impact collapsed his parachute and it raps around support wires higher top the bridge leaving his tingling. His angles broke. Ignoring the pain he kicked against the bridge tower, deployed the reserve parachute and fell into the water being rescued quickly from the coast guard (video narrative 6). In the second case, after falling illegally from the 400 foot pendulum swing of the high way long swing from Tampa Bay of Florida the Dare Devils are floating in the water all together. Lora was unconscious with a broken neck and Geoff was not breathing with a broken neck as well. The power boat of the team approached them. The Dare Devils, who were conscious and held onto their injured partners, were shouting to the power boat seeking for help. A second boat was in very close distance from them. One man did rescue breathing to Lora who was facing up by using the mouth to mouth technique (video narrative 2). Teenagers jumped from high rocks into the sea (interview 10), a young couple swam and was trapped in a rip current (interview 14), a father with his child swam disregarding the warning red flags that prohibited swimming (interview 20), an epileptic went spear gun fishing alone having an epileptic seizure that cost his life (interview 24) and an amateur lifesaver tried to rescue a casualty without equipment and knowledge sacrificing himself (interview 25). A lady with health problems instead of swimming close to the lifeguard she swam at the edge of the beach (interview 3). Below the water surface, a scuba diver ignored the safety rule of 'never go alone' and went for a deep dive abandoning his buddy (interview 29). Finally, two young men lost consciousness performing hyperventilation; the first was unattended and the second one was supervised by others but not closely (interviews 30 and 31).

Discussion

Summarizing both studies, it was found that risk-taking behaviour was the cause of drowning in relatively few aquatic accidents (11, 15%). Male adolescent risk takers were sensation seekers who tried to jump into the sea from high levels and their group considered their behaviour normative (interview 10) as stated by Irwin & Ryan, (1989). Older children overestimated their physical abilities. Plumert, (1995) argued

that the tendency to do activities well beyond the personal ability is attenuated by more experience of performing the activities and this is why in two other cases, a young girl and boy swam in the sea out of their depth (video narratives 26; 27). However, according to Llewellyn, (2003) sporting risk takers tend to be very confident that they can manage the risks involved. This was the case of an old man who went yachting alone and nearly drowned in rough sea (video narrative 16).

"Risk optimizers", i.e. stuntmen participate in high risk activities because of the risks involved (Llewellyn, 2003). A risk taking activity, contains danger, and sensation seekers (stuntmen) were willing to take risks that involved psychological anxiety (7, 9%) for satisfying their need (e.g. illegal bungee jump and parachute jump from high bridges), because they viewed the world as less threatening and fearful, expecting that the outcome of their risky behaviour would be less negative (Franken et al., 1992). They enjoyed the danger of their risky activity as pleasant because they had the necessary preparation that would allow them to have a personal control in the risk taking (Apter, 1982). They took risks participating voluntarily (Hewitt et al., 1995); a male adult, member of the team, before the jump commended: '*Oouou, ready to go. Let's go over the edge*'. Another 19-year old inexperienced but very excited male team member, commended like that: "*I got some butterflies; you will be stupid if you weren't, you would be damned if you had seen that bridge before. But I got the butterflies*".

As shown in previous studies, risk takers in this study are unrealistically optimistic (Rutter, Quine & Albery, 1998) expecting that misfortunes will happen to others and they were more likely than the average to experience the good ones (Weinstein, 1980). But in that incident except drowning, some of them fell to unconsciousness and one broke his neck. Although risk taking was linked with drowning only in nearly one tenth of the reported cases, it is interesting to realize that about one person in every 10 might be a sensation seeker triggered from aquatic adventures that they consider as rewarding, exciting, fun and exhilarating (Miles and Priest, 1990). As pointed out by Franken, (1998) they were highly skilled people, who didn't experience high level of fear feeling self-satisfaction by behaving riskily getting involved in activities that require developed coping skills in the face of uncertainty. Unfortunately, in all reported cases where risk taking behaviour was present, a drowning incident occurred, which seems that risk takers cannot always have the control of their risky actions.

According to Ball, Carroll & Rounsaville, (1994) high sensation seekers were more likely to report both a lifetime history of antisocial behaviour. This was found in one case, where the leader of the group that performed the illegal bungee jump, was a professional stuntman, having performed several other stunts in the past (e.g. Niagara's falls barrel). Despite the findings of previous research (Eaton, 1995; Bierens et al., 1996; Mackie, 1999; Smith et al., 2001), only one case was reported presently where the casualty performed a risky activity drunk. According to some studies, people perceive risky activities as being less dangerous when intoxicated than when sober the alcohol effects drug effects reduce the belief that negative consequences may occur, which reasonably can increase risk taking behaviour (Fromme, Katz & D'Amico, 1997). The drunken casualty eventually drowned, after the unsuccessful intervention of the lifeguard team to rescue and resuscitate him

afterwards. Although he was swimming well, in a lifeguarded area, he had eaten and drunk a lot of food and alcohol;

'A foreign man, about 50-years old, had drunk a lot of beer and had eaten. At the end of the lifeguard's shift, the man decided to go swimming. At the same time, the leader of our special rescue team came to see the beach. So we were 3 lifeguards at that time. [...] He was swimming fine, backstroke with both hands [...] When we looked back at him, less than a minute later, we saw his head in the water and arms stretched out on the surface. [...] A cardio pulmonary resuscitation was made [...] He began vomiting food and beer' (interview 11).

Therefore, one could argue that even swimming in such controlled conditions, could be considered as a risk taking behaviour if it follows a heavy meal and alcohol consumption. This leads to the conclusion that risk takers are not only those that seek pleasure from activities that contain some degree of risk but also those that disregard the safety rules and prohibitions in an aquatic area. As pointed by Llewellyn (2003), people take different risks in different aspects of their lives, and so, further research is needed to examine whether risk taking behaviours generalise to the degree that they can be treated as being functionally equivalent in psychological terms.

A risky behaviour is an effective symbol when it is recognized as risky by others (Lightfoot, 1997). This was the case in the above incidents because all stuntmen initiated their risk taking activities surrounded by a group of colleagues who video recorded the stunt. Finally, those people seem to be high sensation seekers because they ignored every prohibition about their action that wasn't consistent with their behaviours; this was the only way of dealing with the discrepancy between their behaviour and the perceptions of other people (Franken et al., 1992). Therefore, part of the problem of risk taking behaviour relies on the relationship between individuals and their social groups that is the relational context in which a person's action has meaning. In the present study some casualties (3, 4%) got in difficulties influenced by their group (e.g. jumping into the sea from high rocks without knowing swimming, snorkelling in areas with sharks, inexperienced volunteer performing an illegal stunt doing bungee jumping from a bridge) or performing a risky activity because of the presence of the public (3, 4%) (e.g. a parachute jump from a high bridge above the sea while cars were passing around). As Lightfoot's, (1997) interviewee stated, people are *'not as inclined to do it alone. It would be lonely. It kind of strengthens the bond of friendship. If it is something risky then you will both remember it fondly, having outgrown it'* (p. 111). This agrees with the findings of the following script. *'He dove from very high up. We cheered. The other friends followed from different lesser heights. One of us wasn't a very good swimmer. We told him 'don't jump. There is no shame in saying you can't swim very well'. 'No, you all jumped. What am I, stupid?'* (interview 10).

Conclusions

The study found that, people tend to behave riskily while engaged in swimming and non-aquatic activities that perceive as controllable. Stuntmen are willing to take risks that involve psychological anxiety for satisfying their needs participating voluntarily, because they view the world as less threatening and fearful, expecting that the outcome of their risky behaviour would be less negative. High sensation seekers ignore the prohibitions that are not consistent with their behaviour; they are

unrealistically optimistic and expect that the misfortunes will happen to others. Some risk takers are likely to report a lifetime history of antisocial behaviour. Part of the problem of risk taking behaviour relies on the relationship between individuals and their social groups that is the relational context in which a person's action has meaning. From all the above it seems that risk taking may lead to drowning.

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