

## PERSONALITY PROCESSES AND INDIVIDUAL DIFFERENCES

The Role of Sensation Seeking in Political Violence: An Extension of the  
Significance Quest TheoryBirga M. Schumpe and Jocelyn J. Bélanger  
New York University Abu DhabiManuel Moyano  
University of CórdobaClaudia F. Nisa  
New York University Abu Dhabi

Adventure and excitement have often been invoked to explain why people engage in political violence, yet empirical evidence on the topic has thus far been anecdotal. The present research sought to fill this gap in knowledge by examining the role of sensation seeking in political violence and integrating this concept with Significance Quest Theory (Kruglanski, Chen, Dechesne, Fishman, & Orehek, 2009; Kruglanski et al., 2013). Extending prior research on violent extremism, Study 1 found that sensation seeking mediated the relation between meaning in life and willingness to self-sacrifice and support for political violence. Study 2 established temporal precedence of the variables in the mediation model, using a longitudinal design. Studies 3 and 4 experimentally replicated findings of Studies 1 and 2. In Studies 5a and 5b, we found that sensation seeking predicts support for a real life violent activist group. In Studies 6a and 6b, the positive evaluation of a violent activist group by individuals high in sensation seeking was explained by how exciting they perceived the group to be. Finally, Study 7 introduced an intervention targeting the sensation seeking motive by presenting participants with a peaceful (less exciting vs. exciting) activism group. As hypothesized, providing individuals high in sensation seeking with a peaceful yet exciting group mitigated their support for extreme behavior.

*Keywords:* political violence, search for meaning, self-sacrifice, sensation seeking

Understanding what inspires humans to use violence and sacrifice their lives for a cause is a pressing issue. In recent years, an unprecedented number of politically and religiously motivated acts of violence have taken place across the globe (Institute for Economics & Peace, 2017). In 2016, more than 13,400 terrorist attacks occurred worldwide, resulting in more than 34,000 total deaths, including more than 11,600 perpetrator deaths (Miller, 2017). In the same time period, the United Nations Security Council (2015) estimated that more than 25,000 foreign fighters have traveled to join violent groups such as Al-Qaeda and ISIS—a staggering exodus of young adults. Clearly, there are strong psychological forces that compel individuals to join violent groups. Unveiling the mechanisms behind these forces is pivotal to reducing the capability of violent groups to recruit new members.

Recently, scholars have discussed how youth might be lured to join political or religious movements because of their yearning for adventure and significance (Atran & Sheikh, 2015; Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014; Victoroff, 2005; Zimbardo, Ferras, & Brunskill, 2015). We believe that the latter proposition can be unpacked to provide a fuller and more precise account of why a growing number of people are hearing and following the drum beat of extremism. Although research has recently linked people's search for meaning (or significance) with their willingness to self-sacrifice and use violence for a cause (Bélanger, 2013; Bélanger, Caouette, Sharvit, & Dugas, 2014; Dugas et al., 2016; Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014), the role of sensation seeking in political extremism has been suspected, but largely overlooked (Canadian Security Intelligence Service, 2015; Kruglanski & Fishman, 2006). In what follows, we postulate that sensation seeking—the need for adventure and thrill—bridges the gap between the search for meaning and extreme behavior. Furthermore, we report converging evidence that the appeal of political violence can be attenuated by providing a peaceful substitute that fulfills the need for novel and intense sensations.

### The Significance Quest Theory

The present work is grounded in *Significance Quest Theory* (SQT; Kruglanski, Chen, Dechesne, Fishman, & Orehek, 2009;

This article was published Online First November 1, 2018.

Birga M. Schumpe and Jocelyn J. Bélanger, Department of Psychology, New York University Abu Dhabi; Manuel Moyano, Department of Psychology, University of Córdoba; Claudia F. Nisa, Department of Psychology, New York University Abu Dhabi.

Correspondence concerning this article should be addressed to Birga M. Schumpe, Department of Psychology, New York University Abu Dhabi, Abu Dhabi, United Arab Emirates. E-mail: birga.schumpe@nyu.edu

Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014; Kruglanski, Gelfand, Bélanger, Gunaratna, et al., 2014; Kruglanski et al., 2013; Kruglanski & Orehek, 2011), which posits that the desire to matter and to feel meaningful is a fundamental human need (see also Frankl, 1959, 1966). Work guided by this theoretical framework has shown that, when deprived of significance, people become strongly motivated to initiate actions that allow them to restore a sense of significance. In a series of cross-cultural studies, Dugas et al. (2016) observed that significance can be restored through self-sacrifice for a highly valued cause. For example, Iraqi and Palestinian refugees living in Jordan reported greater willingness to self-sacrifice when they felt insignificant. Experimentally thwarting participants' need for competence and belongingness also led to an increase in people's willingness to self-sacrifice. In their last study, Dugas et al. (2016) found that making sacrifices at the behest of an important cause increases feelings of significance. Specifically, after recalling a time when they had made a sacrifice for a cause (vs. recalling a pleasurable experience), participants reported greater pride, personal worth, significance, and purpose in life.

Of particular relevance to the present research, previous studies have also shown that the quest for significance predicts other extreme forms of behavior such as support for political violence. In a sample of Liberation Tigers of Tamil Eelam, Bélanger (2013) showed that the more extremists felt insignificant (i.e., small, worthless, and hopeless) the more they supported armed struggle to obtain a separate country. Notably, this relationship was mediated by terrorists' willingness to self-sacrifice for their ideological convictions, which suggests that loss of significance potentiates the readiness to endorse one's group's ideology and risk life and limb for it.

### Connecting the Search for Meaning to Extreme Behaviors: The Role of Sensation Seeking

For decades, terrorism scholars and government agencies have argued that one of the main appeals of terrorism is the possibility of engaging in an exciting and thrilling social movement (Atran, 2014; Canadian Security Intelligence Service, 2015; Hacker, 1983; Kellen, 1979; Levine, 1999; Nussio, 2017; Victoroff, 2005). This proposition is consistent with several observations such as radicalized youth traveling abroad to join the ranks of ISIS or al-Qaeda (United Nations Security Council, 2015), retrospective accounts of individuals who joined violent armed groups (Nussio, 2017), as well as a few accounts of incarcerated violent extremists reporting *excitement* as a reason for their involvement in ideologically driven movements (Juergensmeyer, 2000). Although the sensation-seeking-violent-extremism hypothesis has been around for many years, support for it is merely anecdotal in nature and needs to be subjected to empirical scrutiny.

There are in fact strong theoretical grounds to consider sensation seeking in the radicalization process leading to violence. As stated previously, the SQT postulates that individuals searching for meaning are strongly motivated to restore significance (Kruglanski et al., 2013; Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014). To achieve this goal, individuals need to find "the appropriate means to significance" (Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014, p. 74) such as ideologies that "promise significance if only one followed its dictates" (p. 81).

In the present research, we hypothesized that individuals who search for meaning broaden their mind to novel, varied, and exploratory thoughts and actions. Similar ideas have been dis-

cussed by political scientist Quintan Wiktorowicz in his concept of "cognitive opening" (2005)—the notion that individuals become receptive to new ideas and worldviews in the aftermath of a personal crisis (e.g., discrimination, socioeconomic disparities, political repression, etc.)—or by Kurt Lewin (1947) in his seminal work on *force field theory*. When individuals find important needs thwarted, such as the need for meaning in life, they become motivated to change (Lewin, 1947; Schein, 1996). Experiences such as humiliation or discrimination demonstrate that previous behavior is ineffective and hence, trigger "scanning," that is, individuals search for a solution by exposing themselves to a variety of new information (Schein, 1996, see also Zand & Sorensen, 1975). And indeed, there is evidence that openness and curiosity can increase meaning in life (e.g., Kashdan & Steger, 2007; Lavigne, Hofman, Ring, Ryder, & Woodward, 2013).

In terms of our theory, the search for meaning in life (sparked by a loss of significance, humiliation, or a personal crisis) motivates people to look for novel and stimulating experiences in an attempt to restore feelings of significance. This search is depicted in the construct of sensation seeking, which has been defined as "the seeking of varied, novel, complex, and intense sensations and experiences, and the willingness to take physical, social, legal, and financial risks for the sake of such experience" (Zuckerman, 1994, p. 27). Such a relationship has been hypothesized earlier by existential theorist Viktor Frankl (1959, 1966) and documented by Melton and Schulenberg (2007) as well as Fahlman, Mercer, Gaskovski, Eastwood, and Eastwood (2009), who found that lack of meaning in life manifests itself in boredom proneness—a facet of sensation seeking. Specifically, Fahlman et al. (2009) provided causal evidence that meaning in life leads to boredom proneness, which in turn, increases individuals' desire to engage in exciting and stimulating activities (e.g., Berlyne, 1960; for a review see Smith, 1981). Indeed, there is substantial evidence that boredom leads to novelty seeking (Ha & Jang, 2015) as well as to sensation seeking behaviors such as impulsive, risky, violent, and dangerous behaviors (Baumeister & Campbell, 1999; for an overview see Boden, 2009). Overall, it follows that sensation seeking induced through the search for meaning could facilitate people's adherence to new exciting beliefs including (but not limited to) fighting for a political cause and risking life and limbs for it.

The idea that engaging in risky or aggressive problem behaviors as the result of a lack of meaning in life is well documented (e.g., Brassai, Piko, & Steger, 2011; Frankl, 1966; Shek, Ma, & Cheung, 1994). For instance, our theorizing is in line with Orit Taubman-Ben-Ari (2004), who argues that young people are prone to finding a "sense of aliveness" in risky behaviors ('walking on the edge,' p. 106). The excitement and thrill of extreme and dangerous behaviors can intensify one's sense of living a meaningful existence (Taubman-Ben-Ari, 2011) or provide an opportunity to escape negative self-awareness (Baumeister, 1991; Taylor & Hamilton, 1997). Moreover, exciting and sensation-affording activities can be significance-lending because they often demand courage and hence can lead to admiration and confirm important attributes of personal identity (Jessor, 1982, 1991). In that sense, sensation seeking behavior can be understood as means to the goal of feeling significant (e.g., Kruglanski, Chernikova, Babush, Dugas, & Schumpe, 2015; Kruglanski et al., 2002). This is in line with Jessor (1982, p. 196), who argues that engaging in problem behaviors can be seen as "purposeful, meaningful, goal-oriented and functional

rather than arbitrary or perverse” (see also Köpetz, 2017). This is so because the immediate gain is deemed more important than potential long term costs (Jessor, 1991). Although meaning can also be achieved by other significance-lending means such as notable and admired achievements, the thrill of excitement and adventure offers a more immediate solution (cf. Martin, 1999; Zimbardo & Coulombe, 2016). Taken together, we hypothesize that the search for meaning can trigger the opening to novel, varied, and intense stimulation, meaning that it can lead to sensation seeking.

Although its relation to politically or religiously motivated violence has never been empirically tested, a rich literature on sensation seeking (e.g., Zuckerman, 1969, 1979, 2007) has discussed people’s need to seek out novel and intense stimulation. For example, sensation seeking has been positively related to a variety of high-risk activities such as criminal behavior (Horvath & Zuckerman, 1993), delinquency in youth (Pérez & Torrubia, 1985), reckless driving, speeding, smoking marijuana or using other illegal drugs, as well as risky sexual behaviors (Arnett, 1998; Bradley & Wildman, 2002; Charnigo et al., 2013; Jonah, 1997; Taubman-Ben-Ari, Eherenfreund-Hager, & Prato, 2016; Zuckerman, Eysenck, & Eysenck, 1978). Sensation seeking has also been associated with a preference for high-risk sports (e.g., skydiving or rock climbing, Jack & Ronan, 1998; Zuckerman, 1983), watching fights, or actively engaging in them (Russell, 2004; Russell & Arms, 1998).

Overall, sensation seeking predicts negative risks such as drug use and criminal activities, but it also predicts positive risks such as sports, riding roller coasters, and going on blind dates (Fischer & Smith, 2004). Moreover, there is also evidence that individuals high in sensation seeking look for riskier jobs such as police officers, fire-fighters, and rescue units (Gomà-i-Freixanet, Pérez, & Torrubia, 1988; Montag & Birenbaum, 1986), showing that sensation seeking is not uniquely associated with violence. Thus, understanding how the need for novel and exciting experiences can be redirected toward prosocial endeavors appears vital to help people reach their goals without resorting to violence.

### **Interventions Targeting the Sensation Seeking Motive**

Historically, the study of sensation seeking (Zuckerman, 1969) began with the finding that individuals react differently to sensory deprivation: some individuals need more stimulation than others to feel comfortable. Berlyne (1960, 1971) suggested a curvilinear relationship between the arousal potential of stimuli and their hedonic value: Low-arousing stimuli elicited little or no pleasurable affect; moderately arousing stimuli produced a pleasurable affective response, but beyond a maximal level of arousal, pleasantness decreases. Because optimal levels of stimulation and arousal vary among individuals (Eysenck, 1963, 1967; Gray, 1964; Zuckerman, 1969; Zuckerman, Kolin, Price, & Zoob, 1964), people differ in how much they need novel and intense stimulation to feel and function well (Zuckerman et al., 1964).

Given that sensation seeking is related to numerous unhealthy and illegal behaviors (e.g., Newcomb & McGee, 1991), prevention and intervention messages have been tailored to the needs of high sensation seekers. To this end, Palmgreen and colleagues (Palmgreen & Donohew, 2010; Palmgreen, Donohew, Lorch, Hoyle, & Stephenson, 2001) developed the SENTAR (SENsation seeking TARgeting)

model that posits that individuals high in sensation seeking prefer stimulating messages with high sensation value (Donohew, Lorch, & Palmgreen, 1991). For instance, high sensation value can involve messages that are novel, complex, intense, and involve sudden changes (Berlyne, 1960, 1971). Thus, to reach at-risk populations, that is, individuals high in sensation seeking, the content as well as the context of the messages needs to be considered. Accordingly, Palmgreen and Donohew (2010) tested high sensation value messages for health campaigns (e.g., TV public service announcements) placed in high sensation value context (dramatic, fast-paced TV content).

The effectiveness of the SENTAR approach was demonstrated for reducing behaviors such as drug use and risky sex (e.g., Palmgreen et al., 2001; Zimmerman et al., 2007). Since then, the SENTAR approach has guided several large-scale prevention and intervention programs (Palmgreen, Lorch, Stephenson, Hoyle, & Donohew, 2007). Attesting to its effectiveness, individuals high (versus low) in sensation seeking paid more attention to public service announcements in drug use prevention programs that were high (versus low) in stimulation and embedded in TV programs that were high (versus low) in sensation value (Lorch et al., 1994). Furthermore, individuals high in sensation seeking were more likely to call a helpline when presented with a stimulating (versus nonstimulating) public service announcement (Palmgreen et al., 1995). Overall, SENTAR uses communication strategies tailored to the needs of individuals inclined to engage in various risky and unhealthy behaviors.

The literature on sensation seeking also points to the importance of providing alternative means to satisfy sensation-related needs (Arnett, 1995; Roberti, 2004). One example can be found in the realm of risky sex in homosexual men whereby sensation seeking strongly correlates with the frequency of unprotected anal intercourse, which poses a great risk for HIV infection (Dudley, Rostosky, Korfhage, & Zimmerman, 2004; Kalichman, Heckman, & Kelly, 1996). Zuckerman (2007) suggested intervention programs proposing alternative forms of sexual gratification that are less risky than coital sex, such as mutual masturbation and oral sex.

With regard to drug abuse treatment programs, Zuckerman (2007) observed that the question of how life would look after drug cessation comes up regularly. Working a monotonous 9-to-5 job or settling down in a monogamous relationship is not in line with the motives of most sensation seekers. Therefore, it has been suggested that programs should offer more healthy alternatives for the expression of the sensation seeking motive that are also able to satisfy arousal related needs (Arnett, 1995; Roberti, 2004; Zuckerman, 2007).

### **Counteracting Political Violence by Addressing Psychological Needs**

The foregoing analysis indicates that prevention and intervention messages should be tailored to address recipients’ psychological needs and provide healthier alternatives to satisfy them. Thus, if wanting to engage in political violence is indeed fueled by the desire for novel and stimulating experiences, it follows that anti-violence campaigns are more likely to be effective if they address these psychological motives. However, one observation concerning current campaigns against political violence is that they generally advocate for moderation when trying to persuade young adults not to join violent groups. As Upal (2015) observes, “most

of our ad-hoc counter narrative efforts on both social and traditional mass media focus on pointing out logical absurdities of Jihadist worldview (e.g., ‘so DAESH wants to build a future, well is beheading a future you want, or someone controlling details of your diet and dress’), but do not offer a well thought out comprehensive alternative narrative” (p. 65). This discrepancy led us to believe that current antiviolence campaigns would be more effective when tapping into the psychological needs of at-risk populations. Specifically, providing exciting, yet peaceful, alternatives, such as nonviolent groups, could potentially channel the sensation seeking motive in a prosocial direction. This echoes anthropologist and terrorism expert, Scott Atran, who observed that in the context of preventing Islamist extremism, appeals to “moderate Islam” are likely to fail because these messages are not tailored to the youth’s psychological needs. He notes: “When I hear another tired appeal to ‘moderate Islam,’ usually from much older folk, I ask: Are you kidding? Do not any of you have teenage children? When did ‘moderate’ anything have wide appeal for youth yearning for adventure, glory, and significance?” (Atran, 2015, p. 3). Accordingly, Atran (2015) emphasized the necessity of providing the youth with exciting life projects that enable them to find a meaningful existence within society. The quest for personal significance also makes a similar prediction: “Whether a prosocial or antisocial behavior is enacted should depend on the ideology that identifies the means to significance. Producing a shift from a terrorism-warranting ideology to one that identifies alternative routes to significance thus seems essential to eliminating violence” (Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014, p. 79). In line with this proposition, our objective is to test whether providing an exciting, yet peaceful, alternative to political violence would steer sensation seekers away from violent groups.

### Overview of Studies

The present research examined the role of sensation seeking in political violence by integrating this concept to SQT. Extending prior work on extremism (Bélanger, 2013; Dugas et al., 2016), Study 1 examined whether sensation seeking would mediate the relationship between search for meaning in life and extreme behavior (i.e., self-sacrifice and support for political violence). Study 2 replicated Study 1 using a longitudinal design to demonstrate that the search for meaning is associated with sensation seeking, which, in turn, prospectively predicts support for political violence three months later. Studies 3 and 4 conceptually replicated Studies 1 and 2 using experimental manipulations of meaning in life. In Studies 5a and 5b, we tested the hypothesis that activists’ sensation seeking would be positively associated with supporting a violent political group. Studies 6a and 6b sought to explore the underlying psychological mechanism related to Study 5’s findings by examining activists’ excitement toward the violent group. After identifying sensation seeking as a predictor of extreme behavior and understanding that perceiving violence as exciting is what attracts sensation seekers to these groups, we tested an intervention to mitigate support for political violence. Specifically, in Study 7, we presented activists with an exciting -yet peaceful- alternative group to reduce support for political violence among high sensation seekers.

### Study 1

The purpose of Study 1 was to provide initial evidence that sensation seeking plays a role in political violence. Whereas previous research has established that search for meaning increases support for extreme behaviors (i.e., self-sacrifice and support for political violence, Bélanger, 2013; Dugas et al., 2016), this study aims to demonstrate that this relationship is mediated by the desire for novel and stimulating experiences. Thus overall, we predicted that search for meaning would be positively associated with sensation seeking, which in turn would be positively related with the willingness to self-sacrifice for a cause and, consequently, lead to support for political violence.

### Method

**Participants and design.** To estimate the sample size needed to test our mediation model, we used the tool developed by Schoemann, Boulton, and Short (2017). Assuming small to moderate effect sizes and setting power at .80, a sample size of 445 people was suggested. In this study, 460 participants (293 women,  $M_{\text{age}} = 31.45$ ,  $SD_{\text{age}} = 13.90$ ) from Andalusia, Spain participated in this research on a voluntary basis. Data were collected through face-to-face interviews.

**Procedure and materials.** Participants responded to a questionnaire intended to measure search for meaning, sensation seeking, willingness to self-sacrifice, support for violence, as well as demographics. Studies 1 and 2 were conducted at a University in Spain, where no Research Ethics Committee or Institutional Review Board is implemented or required.

#### Measures.

**Search for meaning.** We used the five-item scale by Steger, Frazier, Oishi, and Kaler (2006) to assess the extent to which participants search for meaning in their lives ( $\alpha = .90$ ; e.g., “I am always searching for something that makes my life feel significant”; 1 = *Absolutely untrue*; 7 = *Absolutely true*).

**Sensation seeking.** Sensation seeking was measured using Hoyle, Stephenson, Palmgreen, Lorch, and Donohew’s (2002) eight-item scale ( $\alpha = .82$ ; e.g., “I would love to have new and exciting experiences, even if they are illegal”; 1 = *Strongly disagree*; 5 = *Strongly agree*).

**Willingness to self-sacrifice.** Participants’ willingness to self-sacrifice for a cause was assessed using the 10-item ( $\alpha = .87$ ) scale developed by Bélanger et al. (2014). Example items include “I would be ready to give my life for a cause that is extremely dear to me” (1 = *Not agree at all*; 7 = *Very strongly agree*).

**Support for political violence.** We used the 21-item ( $\alpha = .81$ ) belief toward violence scale developed by Bélanger, Richardson, Lafrenière, McCaffery, and Framand (2017) to measure participants’ support for violence (e.g., “Violence is permissible when conducted by a group fighting for a just cause” and “No cause is important enough to justify the killing of civilians (reverse-scored)”; 1 = *Strongly disagree*; 6 = *Strongly agree*).

### Results and Discussion

The predicted model was tested with AMOS (Arbuckle, 2007) using maximum likelihood estimation procedure. We included gender (coded 0 = male; 1 = female) as a control variable because

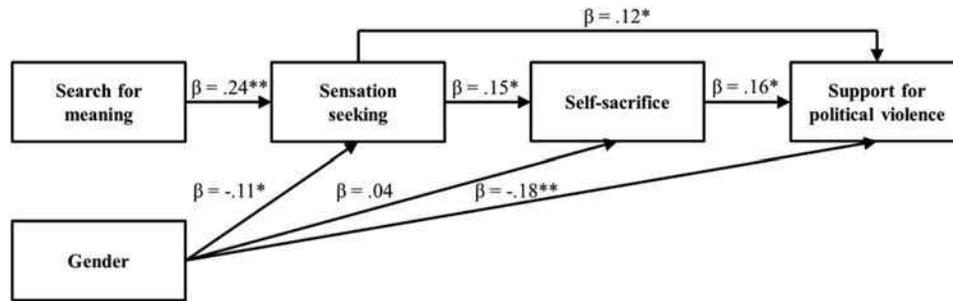


Figure 1. Indirect effect of search for meaning on support for political violence through sensation seeking and self-sacrifice, controlling for gender (Study 1). \*  $p < .05$ . \*\*  $p < .001$ . Gender: 0 = male, 1 = female.

gender differences in the sensation seeking motive have been frequently reported (Zuckerman, 1979, 2007). In total, seven paths were specified: One path from search for meaning to sensation seeking, one path from sensation seeking to self-sacrifice, one path from sensation seeking to support for political violence, one path from self-sacrifice to support for political violence, as well as three paths from gender to the predicted variables (see Figure 1). We display means, standard deviations, and correlations for all measures in Table 1.<sup>1</sup> Results revealed that the hypothesized model fits the data well,  $\chi^2(df = 2, N = 460) = 1.16, p = .561, GFI = .99, CFI = 1.00, IFI = 1.00, RMSEA = .00, AIC = 27.16$ .

Search for meaning predicted sensation seeking ( $\beta = .24, p < .001$ ), which predicted willingness to self-sacrifice ( $\beta = .15, p = .001$ ), which in turn predicted support for political violence ( $\beta = .16, p < .001$ ). Bootstrapped confidence interval estimates of the indirect effect (Preacher & Hayes, 2008) were calculated to test the significance of mediation. Results showed an indirect effect of search for meaning on support for political violence via sensation seeking and willingness to self-sacrifice ( $\beta = .04; 95\% CI [.01, .06]$ ). Sensation seeking was also predictive of support for political violence ( $\beta = .12, p = .007$ ). Gender was significantly related to sensation seeking ( $\beta = -.11, p = .019$ ) and support for political violence ( $\beta = -.18, p < .001$ ), but not to self-sacrifice ( $\beta = -.04, p = .43$ ).

Findings of Study 1 provide initial evidence for the role of sensation seeking in explaining people’s willingness to engage in violence. Specifically, our model hypothesized a mediating effect of sensation seeking between search for meaning and willingness to self-sacrifice and support for political violence. Therefore, results of Study 1 extend prior work that found a connection between search for meaning in life and extreme behaviors (i.e., self-

sacrifice and support for political violence, Bélanger, 2013; Dugas et al., 2016). In conclusion, increased sensation seeking is one mechanism that links the search for meaning to greater willingness to self-sacrifice and to engage in violent behaviors. Moreover, these findings are consistent with the concepts of cognitive opening (Wiktorowicz, 2005) and scanning (Lewin, 1947; Schein, 1996) that were hypothesized to occur when the fundamental need to feel meaningful is not fulfilled. One limitation of Study 1 is that it remains of correlational nature. To further corroborate the direction of the effect, Study 2 implemented a longitudinal design.

Study 2

Radicalization leading to violence is a process that takes time. However, research to date has not shown how this process exactly unfolds. We believe the process starts with the search for meaning, which increases the desire for novel experiences. This makes people more susceptible to adhere to extreme ideological beliefs supporting political violence. In Study 2, we employed a longitudinal design to test for the effect of search for meaning on support for political violence via increased sensation seeking over the course of several months. The implemented design allowed us to measure the hypothesized cause (search for meaning at time point 1) as well as the hypothesized mechanism (sensation seeking at time point 1) before the hypothesized consequence (change in support for political violence at time point 2). Moreover, we controlled for support for political violence at time point 1, thereby ruling out potential confounds (Gollob & Reichardt, 1991; Heaven & Ciarrochi, 2008; Soenens et al., 2008).

Method

**Participants and design.** We used the same tool as in Study 1 to estimate the required sample size. Setting power at .80 and assuming small to moderate effect sizes, the suggested sample size was 325 respondents (320 if we based estimations on the correlation matrix obtained in Study 1). We aimed for 370 participants because of an anticipated dropout of about 10%, which seems typical for longitudinal studies (e.g., Weiss, 2005). Three hundred seventy-one participants from Spain (269 women;  $M_{age} = 27.89$ ,

Table 1  
Means, Standard Deviations, and Correlations Involving Variables From Study 1 (N = 460)

| Variable                 | M    | SD   | 2     | 3    | 4     | 5      |
|--------------------------|------|------|-------|------|-------|--------|
| Search for meaning (1)   | 4.33 | 1.44 | .23** | .07  | -.01  | .06    |
| Sensation seeking (2)    | 3.04 | .90  |       | .15* | .16*  | -.09*  |
| Self-sacrifice (3)       | 3.96 | 1.13 |       |      | .19** | -.05   |
| Support for violence (4) | 1.78 | 0.66 |       |      |       | -.20** |
| Gender <sup>a</sup> (5)  | 0.64 | 0.48 |       |      |       |        |

<sup>a</sup> 0 = male; 1 = female.  
\*  $p < .05$ . \*\*  $p < .001$ .

<sup>1</sup> We log-transformed support for violence but report means and standard deviations for raw data for better understandability. In the following studies, we did the same for all non-normally distributed variables.

$SD_{age} = 11.95$ ) took the survey on a voluntary basis. Three months later, 269 participants (197 women,  $M_{age} = 27.70$ ,  $SD_{age} = 11.74$ ) completed the survey again.

**Procedure and materials.** Participants responded to an online questionnaire measuring their search for meaning in life, sensation seeking, support for political violence, and demographics at two time points (November 2016 and February 2017). Short versions of the scales were utilized to keep the time it took to complete the questionnaire as well as participant attrition to a minimum.

**Measures.**

**Search for meaning.** We used three items of the scale used in Study 1 (Time 1:  $\alpha = .80$ ; Time 2:  $\alpha = .85$ ).

**Sensation seeking.** We used four items of the scale used in Study 1 (Time 1:  $\alpha = .69$ ; Time 2:  $\alpha = .76$ ).

**Support for political violence.** We used seven items of the scale used in Study 1 (Time 1:  $\alpha = .62$ ; Time 2:  $\alpha = .70$ ).

**Results and Discussion**

Between time points 1 and 2, there was an attrition rate of about 27%. First, we tested for a possible attrition bias (Goodman & Blum, 1996; Miller & Hollist, 2007). We used logistic regression to test whether age, gender, search for meaning, sensation seeking, or support for political violence at time point 1 was predictive of participants either finishing at time point 2 or dropping out of the survey (all  $ps > .12$ ). Therefore, we can conclude that participants who dropped out after time point 1 were not systematically different from those who completed the study at time point 2.

Second, we tested the mediating role of sensation seeking in the relationship between search for meaning and support for political violence. Analyses were conducted with AMOS (Arbuckle, 2007) and maximum likelihood estimation procedure. Akin to Study 1, we included gender (coded 0 = male; 1 = female) as a control variable. More importantly, the longitudinal design of Study 2 controlled for support for political violence at time point 1 to rule out a possible confound. In total, six paths were specified: One path from search for meaning to sensation seeking, one path from sensation seeking to support for political violence, one path from support for political violence at T1 to support for political violence at T2, as well as four paths from the control variables to the predicted variables (see Figure 2). We display means, standard deviations, and correlations for all measures in Table 2. Results revealed that the hypothesized

Table 2

Means, Standard Deviations, and Correlations Involving Variables From Study 2 ( $N = 269$ )

| Variable                  | M    | SD   | 2     | 3     | 4     | 5     |
|---------------------------|------|------|-------|-------|-------|-------|
| Search for meaning T1 (1) | 3.51 | 1.55 | .32** | .08   | .00   | .08   |
| Sensation seeking T1 (2)  | 3.98 | 1.26 |       | .26** | .24** | .11   |
| Violence T2 (3)           | 1.69 | 0.71 |       |       | .68** | -.11  |
| Violence T1 (4)           | 1.65 | 0.62 |       |       |       | -.13* |
| Gender <sup>a</sup> (5)   | 0.73 | 0.44 |       |       |       |       |

Note. T1 and T2 denote two time points of measurement.

<sup>a</sup> 0 = male; 1 = female.

\*  $p < .05$ . \*\*  $p < .001$ .

model fits the data well,  $\chi^2(df = 1, N = 269) = 1.28, p = .23$ , GFI = .99, CFI = .99, IFI = .99, RMSEA = .03, AIC = 29.29.

Search for meaning at time point 1 predicted sensation seeking at time point 1 ( $\beta = .32, p < .001$ ), which predicted support for political violence at time point 2 ( $\beta = .12, p = .02$ ). Bootstrapped confidence interval estimates (Preacher & Hayes, 2008) showed an indirect effect of search for meaning on support for political violence via sensation seeking ( $\beta = .03$ ; 95% CI [.006, .069]). Support for political violence at time point 1 was related to sensation seeking at time point 1 ( $\beta = .25, p < .001$ ) and to support for political violence at time point 2 ( $\beta = .65, p < .001$ ). Gender was related to sensation seeking at time point 1 ( $\beta = .11, p = .04$ ), but not to support for political violence at time point 2 ( $\beta = -.04, p = .35$ ).

Replicating Study 1, results supported the hypothesized mediating effect of sensation seeking between search for meaning and support for political violence. Moreover, Study 2 demonstrated that radicalization is a process that unfolds over time: Sensation seeking increased as a result of heightened search for meaning in life, which then led to greater support for political violence later on.

Study 2 overcomes limitation of Study 1 by providing evidence for the causal relationship between the variables in our model—because a fundamental requirement for causality is that one variable precedes the other in time (Holland, 1986; Sobel, 1990). However, only an experiment in which search for meaning is manipulated allows to test the hypothesized causal relationship between variables in our model.

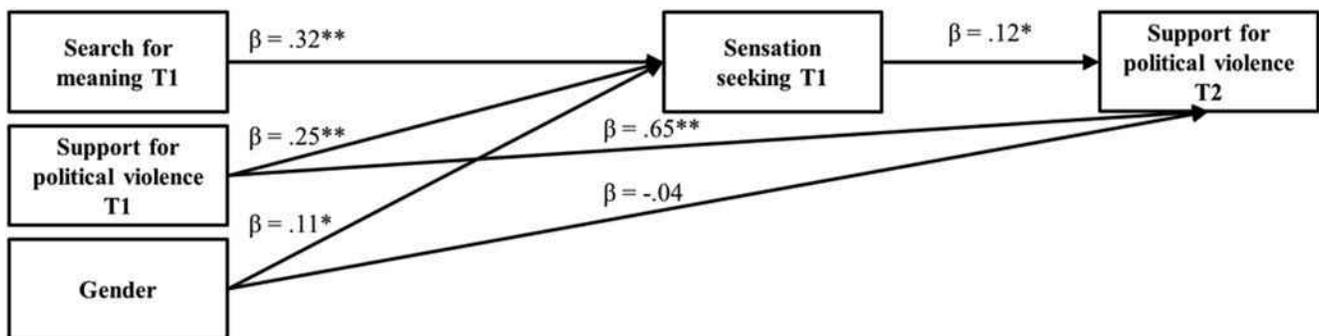


Figure 2. Indirect effect of search for meaning on support for political violence through sensation seeking over two time points (T1 and T2), controlling for support for political violence at T1 as well as for gender (Study 2). \*  $p < .05$ . \*\*  $p < .001$ . Gender: 0 = male, 1 = female.

### Study 3

Study 3 tested the causal relationship of our model. We expected that experimentally increasing people’s meaning in life would decrease their need for sensation seeking and thus, reduce their support for political violence. Specifically, we hypothesized that individuals who reflect on their current legacy (i.e., something to pass on to make a meaningful, lasting and energizing contribution to humanity; Cave, 2012; Kotre, 1999), would perceive more meaning in their lives and thus report lower sensation seeking and support for political violence.

### Method

**Participants and design.** Expecting a strong effect of the experimental manipulation, we estimated the sample size to be 112 participants with power set at .80. The final sample comprised 121 participants (64 women,  $M_{age} = 31.73$   $SD_{age} = 6.91$ ) on MTurk for an experimental design with two conditions.

**Procedure and materials.** Participants read a short text defining what a legacy is (i.e., something to pass on; a meaningful contribution to humanity). Then, they were randomly assigned to one of two experimental conditions. In the legacy condition, participants were asked to write down their current legacy. In the control condition, participants were asked to write about their favorite style of sports shoes. Next, we measured search for meaning, sensation seeking, support for political violence, as well as demographic variables. This study as well as all following studies were approved by the Institutional Review Board (“Sensation seeking,” #095–2017).

#### Measures.

**Search for meaning.** We measured search for meaning using the same items as in Study 1 ( $\alpha = .97$ ).

**Sensation seeking.** We measured sensation seeking using the same items as in Study 1 ( $\alpha = .85$ ).

**Support for political violence.** Participants’ support for political violence was measured using a short 12-item version ( $\alpha = .85$ ; 1 = *Strongly disagree*; 9 = *Strongly agree*) of the scale used in Study 1.

### Results and Discussion

The predicted model was tested with AMOS (Arbuckle, 2007) using maximum likelihood estimation procedure. Three paths were specified: one path from experimental condition (0 = control, 1 = legacy) to search for meaning, one path from search for meaning to sensation seeking, and one path from sensation seeking to support for political violence (see Figure 3). We display means, standard deviations, and correlations for all measures in Table 3. Results revealed that the hypothesized model fits the data well,  $\chi^2(df = 3, N = 121) = 1.51, p = .679, GFI = .99, CFI = 1.00, IFI = 1.00, RMSEA = .00, AIC = 15.51$ . Experimental condition

Table 3

Means, Standard Deviations, and Correlations Involving Variables From Study 3 ( $N = 121$ )

| Variable                        | <i>M</i> | <i>SD</i> | 2    | 3    | 4     |
|---------------------------------|----------|-----------|------|------|-------|
| Exp. condition <sup>a</sup> (1) | 0.50     | 0.50      | .20* | .05  | .05   |
| Search for meaning (2)          | 4.19     | 1.76      |      | .18* | .12   |
| Sensation seeking (3)           | 2.68     | 0.90      |      |      | .37** |
| Support for violence (4)        | 2.58     | 1.08      |      |      |       |

<sup>a</sup> 0 = control, 1 = legacy.

\*  $p < .05$ . \*\*  $p < .001$ .

was predictive of search for meaning ( $\beta = -.20, p = .03$ ), which in turn predicted sensation seeking ( $\beta = .18, p = .045$ ), which was positively associated with support for political violence ( $\beta = .37, p < .001$ ). We calculated bootstrapped confidence interval estimates (Preacher & Hayes, 2008) and confirmed the indirect effect ( $\beta = -.01; 95\% CI [-.044, -.001]$ ).

In support of our theorizing, experimentally increasing meaning in people’s lives lowered sensation seeking and consequently, their support for political violence. This suggests that giving meaning, and thus, fulfilling the quest for personal significance, has a trickle-down effect on other motives such as the desire to engage in novel and exciting experiences and thus, help people steer clear from political violence. Accordingly, we demonstrated the causal relationship between the variables of our postulated model. However, Study 3 had a small sample size and the manipulation was only geared toward decreasing (vs. increasing) the search for meaning. Study 4 was conducted to overcome these limitations.

### Study 4

Study 4 aimed at conceptually replicating Study 3. We experimentally increased the search for meaning using a recall task.

### Method

**Participants and design.** Based on the effect sizes obtained in Study 3, we estimated the required sample size to be 305 with .80 power (Schoemann et al., 2017). We recruited 305 participants (149 women;  $M_{age} = 34.71$   $SD_{age} = 11.57$ ) on MTurk for an experimental design with two between-subject conditions.

**Procedure and materials.** Participants were told that the study examined people’s recollection of events. They were randomly assigned to either write about (a) a time when they were looking to find their life’s purpose and felt that they were searching for meaning in life (search for meaning condition), or (b) the last time they went out to buy sports shoes and how they made their purchase decision (control condition). In both conditions, participants were asked to recall this time vividly and to include as much detail as possible to relive the experience. A similar proce-

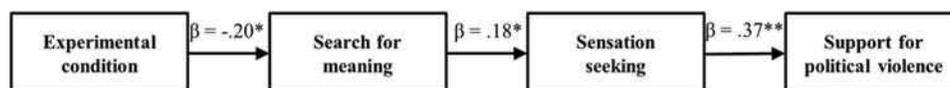


Figure 3. Indirect effect of experimental condition on support for political violence via search for meaning and sensation seeking (Study 3). \*  $p < .05$ . \*\*  $p < .001$ . Experimental condition: 0 = control, 1 = legacy.

ture has been used in prior research to induced situational mindsets (see Bélanger, Lafrenière, Vallerand, & Kruglanski, 2013). Next, we measured search for meaning, sensation seeking, support for political violence, as well as demographic variables.

#### Measures.

**Search for meaning.** We measured search for meaning using the same items as in Study 1 ( $\alpha = .97$ ; 1 = *Not agree at all*, 7 = *Very strongly agree*).

**Sensation seeking.** We measured sensation seeking using the same items ( $\alpha = .89$ ) as in Study 1 (1 = *Not agree at all*, 7 = *Very strongly agree*).

**Support for political violence.** We used the same measure ( $\alpha = .96$ ; 1 = *Not agree at all*; 7 = *Very strongly agree*) as in Study 1.

## Results and Discussion

The predicted model was tested with AMOS (Arbuckle, 2007) using maximum likelihood estimation procedure. Three paths were specified: one path from experimental condition (0 = control, 1 = search for meaning) to search for meaning, one path from search for meaning to sensation seeking, and one path from sensation seeking to support for political violence (see Figure 4). We display means, standard deviations, and correlations for all measures in Table 4. Results revealed that the hypothesized model fits the data well,  $\chi^2(df = 3, N = 305) = 1.63, p = .65, GFI = .99, CFI = 1.00, IFI = 1.00, RMSEA = .00, AIC = 15.62$ . Experimental condition was predictive of search for meaning ( $\beta = .11, p = .048$ ), which in turn predicted sensation seeking ( $\beta = .43, p < .001$ ), which was positively associated with support for political violence ( $\beta = .54, p < .001$ ). We calculated bootstrapped confidence interval estimates (Preacher & Hayes, 2008) and confirmed the indirect effect ( $\beta = .03$ ; 95% CI [.002, .055]).

In support of our theorizing, experimentally inducing search for meaning led to increased levels of sensation seeking, which in turn led to greater support for political violence. This conceptually replicates Study 3 and further corroborates our hypotheses regarding the causal relationships between the variables of our model. Whereas Studies 1–4 provide convergent evidence for our hypotheses using a general and abstract measure of support for political violence, the following studies measured the extent to which people support real violent activist groups.

### Study 5a

In Study 5a, we wanted to conceptually replicate Studies 1–4 and test the validity of our model to predict support for a violent activist group. We aim to demonstrate that activists' search for meaning would translate into supporting a real activist group that engages in violence and that this effect would be mediated by individuals' level of sensation seeking.

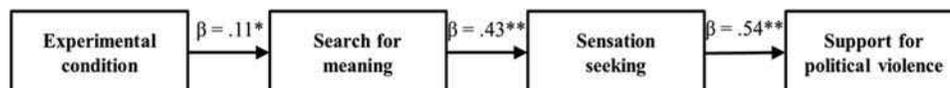


Figure 4. Indirect effect of experimental condition on support for political violence via search for meaning and sensation seeking (Study 4). \*  $p < .05$ . \*\*  $p < .001$ . Experimental condition: 0 = control, 1 = search for meaning.

Table 4

Means, Standard Deviations, and Correlations Involving Variables From Study 4 ( $N = 305$ )

| Variable                        | <i>M</i> | <i>SD</i> | 2    | 3     | 4     |
|---------------------------------|----------|-----------|------|-------|-------|
| Exp. condition <sup>a</sup> (1) | 0.50     | 0.50      | .11* | -.01  | .01   |
| Search for meaning (2)          | 4.08     | 1.76      |      | .43** | .28** |
| Sensation seeking (3)           | 3.55     | 1.42      |      |       | .54** |
| Support for violence (4)        | 2.93     | 1.43      |      |       |       |

<sup>a</sup> 0 = control, 1 = search for meaning.

\*  $p < .05$ . \*\*  $p < .001$ .

## Method

**Participants and design.** Based on the correlations obtained in previous studies and power set at .80, the estimated sample size was 240 participants (the same estimate was obtained when assuming medium effect sizes). The final sample comprised 234 participants (123 women;  $M_{\text{age}} = 33.56, SD_{\text{age}} = 9.62$ ) recruited via MTurk. The study explicitly asked for animal right activists.

**Procedure and materials.** We measured participants' search for meaning, sensation seeking, as well as their evaluation of a violent animal rights activism group. Participants were presented with a text that described the activist group. The animal rights activism group was said to have tracked down and threatened numerous researchers and students who used animals for their research (violent practices mentioned included causing fear and injuries, kill threats as well as car bombing).

#### Measures.

**Search for meaning.** We measured search for meaning using the same items as in Study 1 ( $\alpha = .95$ ; 1 = *Not agree at all*, 7 = *Very strongly agree*).

**Sensation seeking.** We measured sensation seeking using the same items ( $\alpha = .94$ ) as in Study 1 (1 = *Not agree at all*, 7 = *Very strongly agree*).

**Evaluation of activist group.** Participants' evaluation of the activist group was measured using the following four items ( $\alpha = .97$ ; 1 = *Not agree at all*; 7 = *Very strongly agree*): "I would consider joining this group"; "I like this group of activists"; "I would support this group"; and "I like what they are doing."

## Results and Discussion

Path analyses were conducted to examine the mediating role of sensation seeking between search for meaning and evaluation of the violent activism group, controlling for the influence of gender. The model was tested with AMOS (Arbuckle, 2007) using maximum likelihood estimation procedures. Four paths were specified: one path from search for meaning to sensation seeking, one path from sensation seeking to evaluation of the group, and two paths

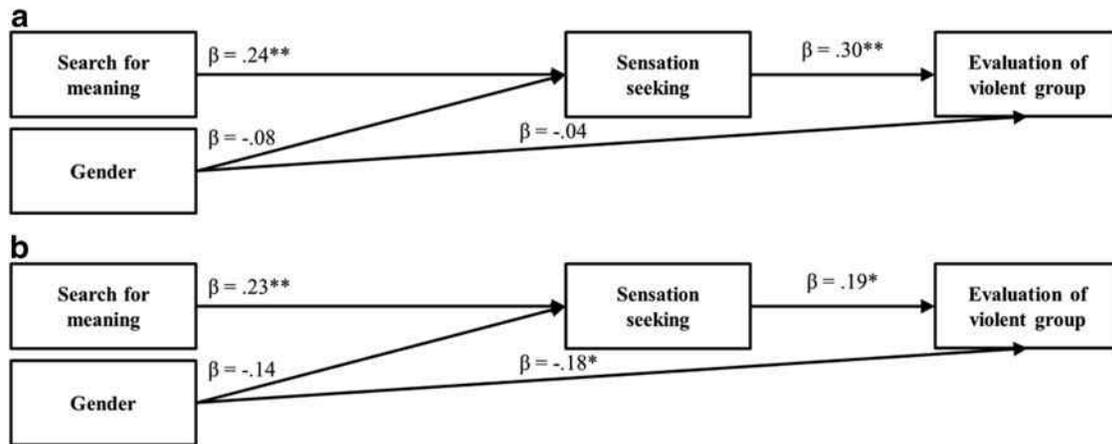


Figure 5. (a) Indirect effect of search for meaning on the evaluation of a violent activist group through sensation seeking, controlling for gender (Study 5a).  $^{**} p < .001$ . Gender: 0 = male, 1 = female. (b) Indirect effect of search for meaning on the evaluation of a violent activist group through sensation seeking, controlling for gender (Study 5b).  $^* p < .05$ .  $^{**} p < .001$ . Gender: 0 = male, 1 = female.

from the control variable (gender) to the dependent variables (see Figure 5a). We display means, standard deviations, and correlations for all measures in Table 5. Results revealed that the hypothesized model fits the data well,  $\chi^2(df = 1, N = 234) = 1.11, p = .29, GFI = .99, CFI = .99, IFI = .99, RMSEA = .02, AIC = 19.11$ .

Search for meaning predicted sensation seeking ( $\beta = .24, p < .001$ ), which in turn was positively associated with the evaluation of the violent group ( $\beta = .30, p < .001$ ). Bootstrapped confidence interval estimates of the indirect effect (Preacher & Hayes, 2008) were calculated to confirm the significance of mediation ( $\beta = .07$ ; 95% CI [.029, .129]). Gender was neither predictive of sensation seeking ( $\beta = -.08, p = .21$ ), nor of the evaluation of the group ( $\beta = -.04, p = .54$ ).

Study 5a extended our model to the evaluation of a real-life violent activist group. Individuals that search for meaning in their lives reported greater liking and support for a politically violent group. As predicted this effect was mediated by sensation seeking. One limitation of this study is that the sample was recruited on MTurk. Thus, it is possible that participants lied about being

animal rights activist to make themselves eligible for participating in the study.

### Study 5b

The purpose of Study 5b was to replicate Study 5a with a sample of animal rights activists recruited outside of MTurk and prescreened for their prior involvement in animal rights groups.

### Method

**Participants and design.** Basing our sample size calculation on the correlation obtained in Study 5a and setting power to .80, the estimated sample size was 160. We used a panel service that prescreened participants to be animal rights activist, that is, they fulfilled selection criteria without knowing to make themselves eligible for this study (e.g., having taken public action for animal rights such as having attended animal rights marches and being a member of an animal rights group). The final sample comprised 160 animal rights activists (87 women;  $M_{age} = 48.26, SD_{age} = 17.06$ ).

**Procedure and materials.** We used the same procedure and materials as in Study 5a.

#### Measures.

**Search for meaning.** We measured search for meaning using the same items as in Study 5a ( $\alpha = .97$ ; 1 = *Not agree at all*, 7 = *Very strongly agree*).

**Sensation seeking.** We measured sensation seeking using the same items ( $\alpha = .72$ ) as in Study 5a (1 = *Not agree at all*, 7 = *Very strongly agree*).

**Evaluation of activist group.** Participants' evaluation of the activist group was measured using the same items as in Study 5a ( $\alpha = .97$ ; 1 = *Not agree at all*; 7 = *Very strongly agree*).

### Results and Discussion

We tested the same path model as in Study 5a (see Figure 5b). We display means, standard deviations, and correlations for all

Table 5  
Means, Standard Deviations, and Correlations Involving Variables From Study 5

| Variable                | M    | SD   | 2                 | 3                 | 4                 |
|-------------------------|------|------|-------------------|-------------------|-------------------|
| Study 5a (N = 234)      |      |      |                   |                   |                   |
| Search for meaning (1)  | 3.83 | 1.74 | .23 <sup>**</sup> | .13 <sup>*</sup>  | .03               |
| Sensation seeking (2)   | 3.27 | 1.28 |                   | .31 <sup>**</sup> | -.07              |
| Group evaluation (3)    | 2.24 | 1.72 |                   |                   | -.06              |
| Gender <sup>a</sup> (4) | 0.53 | 0.50 |                   |                   |                   |
| Study 5b (N = 160)      |      |      |                   |                   |                   |
| Search for meaning (1)  | 4.24 | 1.86 | .23 <sup>**</sup> | .15               | .02               |
| Sensation seeking (2)   | 3.91 | 0.97 |                   | .21 <sup>*</sup>  | -.13              |
| Group evaluation (3)    | 2.21 | 1.44 |                   |                   | -.20 <sup>*</sup> |
| Gender <sup>a</sup> (4) | 0.54 | 0.50 |                   |                   |                   |

<sup>a</sup> 0 = male; 1 = female.

<sup>\*</sup>  $p < .05$ . <sup>\*\*</sup>  $p < .001$ .

measures in Table 5. Results revealed that the hypothesized model fits the data well,  $\chi^2(df = 1, N = 160) = 2.17, p = .14$ , GFI = .99, CFI = .94, IFI = .95, RMSEA = .08, AIC = 20.16.

Search for meaning predicted sensation seeking ( $\beta = .23, p = .003$ ), which in turn was positively associated with the evaluation of the violent group ( $\beta = .19, p = .013$ ). Bootstrapped confidence interval estimates of the indirect effect (Preacher & Hayes, 2008) were calculated to confirm the significance of mediation ( $\beta = .04$ ; 95% CI [.01, .11]). Gender was marginally related to sensation seeking ( $\beta = -.14, p = .08$ ), and significantly related to the evaluation of the violent group ( $\beta = -.18, p = .02$ ).

Study 5b replicated Study 5a with another group of animal rights activists, thereby adding external validity to our model. Activists who searched for meaning in their lives reported greater liking and support for a violent activist group and this effect was mediated by sensation seeking. This begs the question of why political violence is so alluring to individuals high in sensation seeking. In line with previous research that linked sensation seeking to a preference for a variety of exciting activities (e.g., Zuckerman, 1983), we hypothesized that high sensation seekers are attracted by violent groups because they perceive them as exciting.

### Study 6a

Study 6a was conducted to understand why some individuals find violent groups so attractive. We hypothesized that the relation between sensation seeking and the positive evaluation of violent activist groups could be explained by the extent to which individuals perceived the groups as exciting.

### Method

**Participants and design.** Based on the correlations obtained in previous studies and power set at .80, the estimated sample size was 240 participants (the same estimate was obtained when assuming medium effect sizes). We recruited 245 participants (134

women;  $M_{age} = 36.38, SD_{age} = 12.37$ ) via MTurk. The study explicitly asked for animal rights activists.

**Procedure and materials.** We measured participants' sensation seeking, their evaluation of a violent animal rights activism group (same as in Study 5), as well as the extent to which they perceived this group to be exciting and adventurous.

#### Measures.

**Sensation seeking.** We measured sensation seeking using the same items ( $\alpha = .85$ ) as in Study 5.

**Excitement.** We measured the extent to which participants perceived the activist group as exciting and adventurous ("This group seems to be exciting," "This group seems adventurous"; = .71; 1 = *Not agree at all*; 7 = *Very strongly agree*).

**Evaluation of activist group.** We used the same items ( $\alpha = .97$ ) as in Study 5 to measure participants' evaluation of the activist group.

### Results and Discussion

Path analyses were conducted to test the hypothesis that the relationship between sensation seeking and support for violent groups would be mediated by the extent to which individuals perceived the group to be exciting and adventurous (controlling for gender). The model was tested with AMOS (Arbuckle, 2007) using maximum likelihood estimation procedure. Four paths were specified: one path from sensation seeking to how exciting the group was perceived, one path from the perceived excitement to the evaluation of the group, and two paths from gender to the dependent variables (see Figure 6a). We display means, standard deviations, and correlations for all measures in Table 6. Results revealed that the hypothesized model fits the data well,  $\chi^2(df = 1, N = 245) = 3.47, p = .06$ , GFI = .99, CFI = .97, IFI = .98, RMSEA = .10, AIC = 21.47 (Kenny, Kaniskan, & McCoach, 2015).

Sensation seeking predicted how exciting participants perceived the activist group to be ( $\beta = .22, p < .001$ ), which, in turn, was

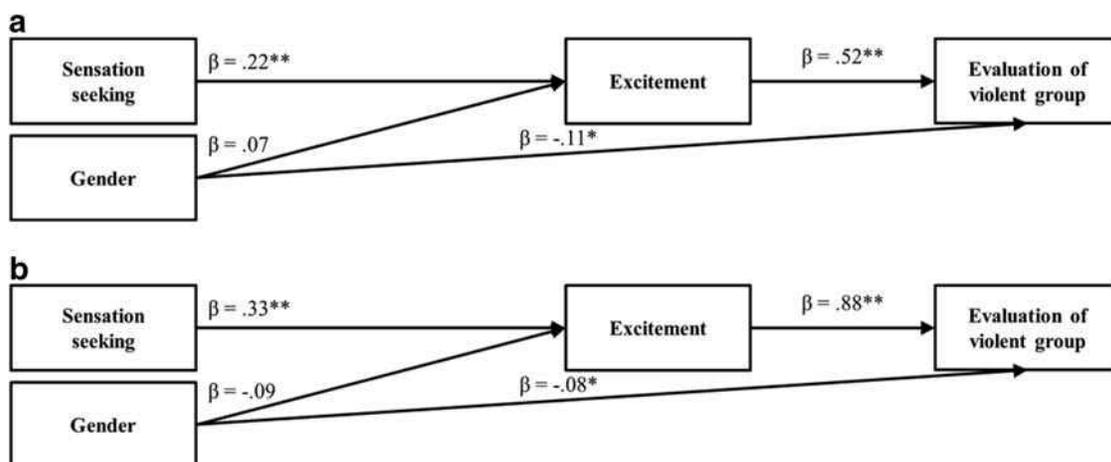


Figure 6. (a) Indirect effect of sensation seeking on the evaluation of a violent activist group through the extent to which the group was perceived as exciting, controlling for gender (Study 6a). \*  $p < .05$ . \*\*  $p < .001$ . Gender: 0 = male, 1 = female. (b) Indirect effect of sensation seeking on the evaluation of a violent activist group through the extent to which the group was perceived as exciting, controlling for gender (Study 6b). \*  $p < .05$ . \*\*  $p < .001$ . Gender: 0 = male, 1 = female.

Table 6  
Means, Standard Deviations, and Correlations Involving Variables From Study 6

| Variable                   | <i>M</i> | <i>SD</i> | 2     | 3     | 4      |
|----------------------------|----------|-----------|-------|-------|--------|
| Study 6a ( <i>N</i> = 245) |          |           |       |       |        |
| Sensation seeking (1)      | 3.36     | 1.29      | .21** | .22** | -.15*  |
| Exciting (2)               | 3.59     | 1.78      |       | .52** | .04    |
| Group evaluation (3)       | 2.03     | 1.63      |       |       | -.09   |
| Gender <sup>a</sup> (4)    | 0.55     | 0.50      |       |       |        |
| Study 6b ( <i>N</i> = 174) |          |           |       |       |        |
| Sensation seeking (1)      | 3.15     | 1.37      | .35** | .31** | -.22*  |
| Exciting (2)               | 3.03     | 2.03      |       | .90** | -.16*  |
| Group evaluation (3)       | 2.87     | 2.02      |       |       | -.23** |
| Gender <sup>a</sup> (4)    | 0.51     | 0.50      |       |       |        |

<sup>a</sup> 0 = male; 1 = female.  
\* *p* < .05. \*\* *p* < .001.

positively associated with the evaluation of the group ( $\beta = .52, p < .001$ ). Results confirmed the mediating role of perceived excitement between sensation seeking and the evaluation of the activist group ( $\beta = .12; 95\% \text{ CI } [.05, .19]$ ). Gender was not related to how exciting the group was perceived ( $\beta = .07, p = .26$ ), but to its overall evaluation ( $\beta = -.11, p = .046$ ).

Results of Study 6a support the notion that violent groups are liked by individuals high in sensation seeking because they perceive those groups as exciting. Therefore, individuals high in sensation seeking can be considered more at risk of joining political violent groups. In the next study, we aimed at replicating this relationship in another sample of animal rights activists.

### Study 6b

Study 6b was conducted to replicate the relations found in Study 6a in a sample of animal rights activists recruited outside of Mturk and prescreened for their prior involvement in animal rights groups. We hypothesized that activists high in sensation seeking would find the violent activists group more exciting and hence evaluate it more favorably.

### Method

**Participants and design.** Based on the results of Study 6a, the estimated sample size with .80 power was 174 participants. We recruited 174 animal rights activists via a panel service (89 women;  $M_{\text{age}} = 52.26, SD_{\text{age}} = 17.93$ ). As in Study 5b, participants were prescreened to be animal rights activist, that is, they fulfilled selection criteria without knowing to make themselves eligible for this study.

**Procedure and materials.** We used the same procedure and materials as in Study 6a.

#### Measures.

**Sensation seeking.** We used the same items ( $\alpha = .88$ ) as in Study 6a.

**Excitement.** We used the same items ( $\alpha = .95$ ) as in Study 6a.

**Evaluation of activist group.** We used the same items ( $\alpha = .97$ ) as in Study 6a.

### Results and Discussion

We tested the same path model as in Study 6a (see Figure 6b). We display means, standard deviations, and correlations for all

measures in Table 6. Results revealed that the hypothesized model had a good fit,  $\chi^2(df = 1, N = 174) = .12, p = .72, \text{GFI} = 1.00, \text{CFI} = 1.00, \text{IFI} = 1.00, \text{RMSEA} = .00, \text{AIC} = 18.12$ .

Sensation seeking predicted how exciting participants perceived the activist group to be ( $\beta = .33, p < .001$ ), which, in turn, was positively associated with the evaluation of the group ( $\beta = .88, p < .001$ ). Results confirmed the mediating role of perceived excitement between sensation seeking and the evaluation of the activist group ( $\beta = .29; 95\% \text{ CI } [.15, .42]$ ). Gender was not related to how exciting the group was perceived ( $\beta = -.09, p = .22$ ), but to its overall evaluation ( $\beta = -.08, p = .01$ ).

Again, results of Study 6b support the notion that violent activists groups are liked by activists high in sensation seeking because they perceive those groups to be exciting. This is of high relevance to the present research, because it adds to the body of knowledge crucial for the creation of effective antiviolence campaigns. In the next study, we tested an intervention that applied this new knowledge to reduce support for political violence in an at-risk population, that is, individuals high in sensation seeking.

### Study 7

Study 7 tested an intervention to reduce political violence by providing participants with an alternative means to fulfill their need for excitement. If the pursuit of excitement is what drives sensation seekers to support violent groups, it follows that providing an alternative means that is functionally equivalent should quell their desire to support violent groups. Thus, we hypothesized that presenting participants with an exciting, yet peaceful, activist group (vs. an unexciting one) would lower their support for political violence, which in turn would reduce support for a violent activists group.

### Method

**Participants and design.** Based on pilot testing, we estimated the required sample size to be 392 participants with power set to .80. We recruited 392 participants (95 women;  $M_{\text{age}} = 36.24, SD_{\text{age}} = 11.27$ ) via MTurk. The study explicitly asked for animal right activists.

**Procedure and materials.** Participants were randomly assigned to one of two experimental conditions. They were either presented with an unexciting or exciting peaceful animal rights activist group to further their cause. The unexciting group was described as using formal statements, such as signed public statements, letters of opposition, or pamphlets. Furthermore, they engaged in nonconsumption of boycotted goods, withdrawal from government educational institutions, sit-downs, or pray-ins. The exciting activist group was described as using the methods of public assemblies, such as performances of plays and music. They also engaged in marches, parades, humorous skits and pranks, speeches advocating resistance, and refused to disperse assemblages.<sup>2</sup>

<sup>2</sup> The methods that were used to describe the group as exciting (versus unexciting) were pretested. We asked 50 participants on MTurk to rate the extent to which they perceived the methods of nonviolent political action (taken from Sharp, 1973) as exciting. As a result, characteristics in the unexciting activist group ( $M = 2.77, SD = 1.17$ ) were perceived as less exciting than characteristics in the exciting group ( $M = 4.02, SD = 1.29; F(1, 49) = 111.38, p < .001, \eta^2 = .69$ ).

After being presented with one of the two groups, participants were asked to fill out a series of questionnaires. We measured how exciting they perceived the activist group to be, their level of sensation seeking, their support for political violence, as well as their support for the violent activist group (same group as used in Studies 5 and 6).

**Measures.**

**Exciting.** We used the same items as in Study 6 to measure the extent to which participants perceived the presented activists group as exciting and adventurous ( $r = .93$ ).

**Sensation seeking.** We used the same measure ( $\alpha = .89$ ) as in Study 1.

**Support for political violence.** We used the same measure ( $\alpha = .96$ ; 1 = *Not agree at all*; 7 = *Very strongly agree*) as in Study 1.

**Evaluation of activist group.** We used the same items ( $\alpha = .98$ ) as in Study 6 to measure participants' evaluation of the violent activist group.

**Results and Discussion**

First, we conducted a manipulation check on how exciting the activist groups were perceived. As expected, the exciting group ( $M = 5.17, SD = 1.27$ ) was perceived as more exciting than the unexciting group ( $M = 4.41, SD = 1.71$ ;  $F(1, 390) = 25.05, p < .001, \eta^2 = .06$ ). Next, we tested the interactive effect of sensation seeking and the experimental condition on support for political violence via willingness to self-sacrifice. Five paths were specified: one from sensation seeking to support for political violence, one from sensation seeking to evaluation of the violent activist group, one from experimental condition (coded 0 = unexciting activist group, 1 = exciting activist group) to support for political violence, one path from the interaction term to support for violence, and one path from support for violence to the evaluation of the violent activist group (see Figure 7). We display means, standard deviations, and correlations for all measures in Table 7.

In line with Aiken and West's (1991) procedures, independent variables were standardized before calculating the interaction products. We tested the interaction (Sensation seeking  $\times$  Experimental condition) on support for political violence using hierarchical multiple regression analyses to test the a-path of this model. We entered sensation seeking and experimental condition in Step

Table 7  
Means, Standard Deviations, and Correlations Involving Variables From Study 7 ( $N = 392$ )

| Variable                        | <i>M</i> | <i>SD</i> | 2    | 3     | 4     |
|---------------------------------|----------|-----------|------|-------|-------|
| Exp. condition <sup>a</sup> (1) | 0.49     | 0.50      | -.06 | -.07  | -.06  |
| Sensation seeking (2)           | 4.22     | 1.50      |      | .56** | .44** |
| Support for violence (3)        | 3.08     | 1.46      |      |       | .64** |
| Group evaluation (4)            | 2.95     | 2.03      |      |       |       |

<sup>a</sup> 0 = unexciting peaceful activist group; 1 = exciting peaceful activist group.  
\*\*  $p < .001$ .

1, as well as the interaction term in Step 2. Step 1 explained a significant amount of variance,  $F(2, 389) = 91.00, p < .001, R^2 = .32$ . Experimental condition ( $\beta = -.03, p = .44$ ) was unrelated to support for political violence but sensation seeking was ( $\beta = .56, p < .001$ ). The addition of the interaction term in Step 2 further increased explained variance significantly,  $F(1, 388) = 5.91, p = .02, R^2 = .01$ . Experimental condition ( $\beta = -.03, p = .44$ ) was unrelated to support for political violence but sensation seeking was ( $\beta = .56, p < .001$ ). The interactive effect of sensation seeking and experimental condition was predictive of support for political violence ( $\beta = -.10, p = .02$ ; see Table 8).

To probe the nature of the interaction, we computed the conditional effects of experimental condition on support for political violence for low (1 *SD* below the mean) versus high (1 *SD* above the mean) levels of sensation seeking. Results showed that the effect was significant for high levels of sensation seeking ( $\beta = -.03, 95\% \text{ CI } [-.05, -.01], t(388) = -2.27, p = .02$ ), but not for low levels of sensation seeking ( $\beta = .01, 95\% \text{ CI } [-.01, .04], t(388) = 1.17, p = .24$ ; see Figure 8). Lastly, we tested the b-path in the model. Results indicated that the association between support for political violence and the evaluation of the violent activist group was significant ( $\beta = .57, p < .001$ ).

The hypothesized model had the following fit indices:  $\chi^2(df = 3, N = 392) = .15, p = .93, \text{GFI} = 1.00, \text{CFI} = 1.00, \text{IFI} = 1.00, \text{RMSEA} = .00, \text{AIC} = 26.15$ . We calculated bootstrapped confidence interval estimates of the indirect effect (Preacher & Hayes, 2008). Results confirmed the mediating role of willingness to

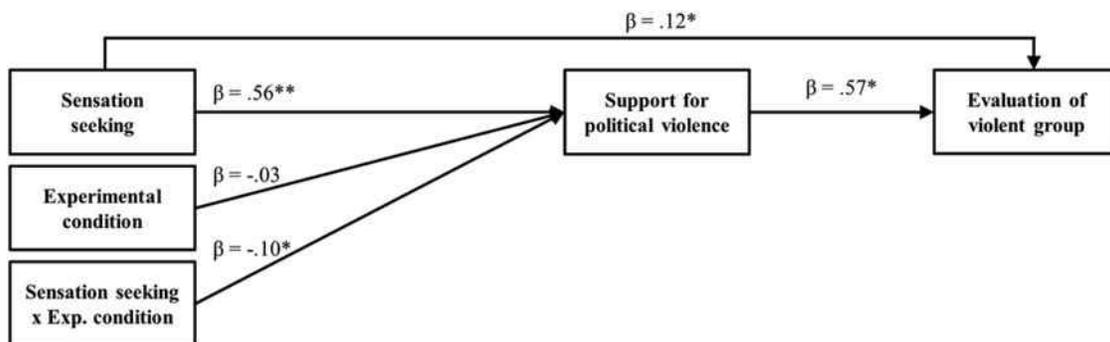


Figure 7. Interactive effect of sensation seeking and experimental condition (unexciting vs. exciting activist group) on the evaluation of a violent activist group via support for political violence (Study 7). \*  $p < .05$ . \*\*  $p < .001$ .

Table 8  
*Results of Hierarchical Multiple Regression Predicting Support for Political Violence From Sensation Seeking and Experimental Condition in Study 7 (N = 392)*

| Step   | F       | R <sup>2</sup> | R <sup>2</sup> | Sensation seeking | Exp. cond. | Sensation seeking Exp. cond. |
|--------|---------|----------------|----------------|-------------------|------------|------------------------------|
| Step 1 | 91.00** | .32            | .32            | .56**             | -.03       | —                            |
| Step 2 | 5.91*   | .33            | .01            | .56**             | -.03       | -.10*                        |

\*  $p < .05$ . \*\*  $p < .001$ .

self-sacrifice between the predicting variables and support for political violence ( $\beta = -.06$ ; 95% CI  $[-.11, -.01]$ ). Overall, Study 7 tested a sensation seeking targeting intervention that successfully reduced support for political violence in individuals high in sensation seeking by presenting an exciting—yet peaceful—alternative to a violent activist group.

### General Discussion

The needs for adventure and significance have often been invoked to explain people’s adherence to politically violent groups (Atran, 2014; Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014; Nussio, 2017). Whereas substantial evidence has been accumulated to demonstrate the role of significance in political violence (e.g., Bélanger, 2013; Dugas et al., 2016; Webber, Klein, Kruglanski, Brizi, & Merari, 2017), empirical research has thus far been silent regarding the notion of excitement and adventure—a peculiar observation given that sensation seeking has been a primary suspect for many years (e.g., Kruglanski & Fishman, 2006). Dissatisfied with the current state of affairs, the Canadian Security Intelligence Service (2015) even published a report urging scholars to clarify the role of sensation seeking in political violence. In response to this call for research and the pressing need to prevent political violence, we conducted seven studies integrating sensation seeking to SQT.

In Study 1, we demonstrated that the effect of search for meaning on willingness to self-sacrifice and support for political violence was mediated by sensation seeking. In Study 2, we tested our model using a longitudinal design: search for meaning positively predicted sensation seeking, which, in turn, prospectively predicted support for political violence three months later. In Studies 3 and 4, experimentally manipulating search for meaning in life altered participants’ sensation seeking, which then impacted their support for political violence. Demonstrating the real-world relevance of our theorizing, Studies 5a and 5b found that sensation seeking was positively related to supporting a violent activist group. In Studies 6a and 6b, we found that this relationship was explained by how exciting the group was perceived. Building on this evidence, we posited that rechanneling this desire for exciting experiences toward a peaceful objective would be possible. Accordingly, in Study 7 we presented activists with an exciting (vs. unexciting), yet peaceful, alternative group, and successfully lowered support for political violence among high (vs. low) sensation seekers. Taken together, our findings indicate that the need for novel and exciting experiences fuels people’s interest in political violence, but it can also be rechanneled toward peaceful political movements that are engaging and exciting.

### Theoretical Implications

**The significance quest theory.** The SQT posits that the loss of significance prompts individuals to search and find “the appropriate means to significance” (Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014, p. 74). The main contribution of this work consists of providing a fuller account of how this search unfolds by (a) examining a psychological mechanism involved in the search for meaning and (b) identifying the types of means that are preferred to fulfill that quest. Specifically, our results indicate that to restore their significance, people pay increased attention to novel and exciting experiences—they become sensation seekers and thus, increasingly allured to extreme behaviors (self-sacrifice and violence) and to groups that carry out such activities. These results empirically substantiate Wiktorowicz’s (2005) concept of cognitive opening, whereby people seek novel and stimulating experiences in times of personal crisis and thus, become more receptive to alternative worldviews and extreme ideologies. Moreover, our theorizing and findings are in line with Lewin’s force field theory (1947), in which he describes that individuals unfreeze when important needs, such as the need for a meaningful existence, are thwarted. They start to “scan,” that is, they search for novel ideas and experiences to find a solution (Schein, 1996). When they find an answer, people refreeze, which can be reflected in attitude change (Lewin, 1947; Zand & Sorensen, 1975). In the context of violent extremism, this seizing and freezing can come in the form of accepting extremist ideologies or joining extremist groups that provide the certainty or opportunity for significance restoration that individuals were looking for (Webber et al., 2018). The process of radicalization triggered by significance loss can be understood as the opening to new and extreme ideas and ideologies, which is then followed by a closing of the mind and freezing on the extremist beliefs.

Contrary to what is generally understood from the relationship between sensation seeking and aggression, the need for excitement and thrill does not necessarily “doom” one to adhere to hostile belief systems. Indeed, as shown in Study 7, the relationship between sensation seeking and support for political violence can be reversed when a peaceful and exciting alternative is made

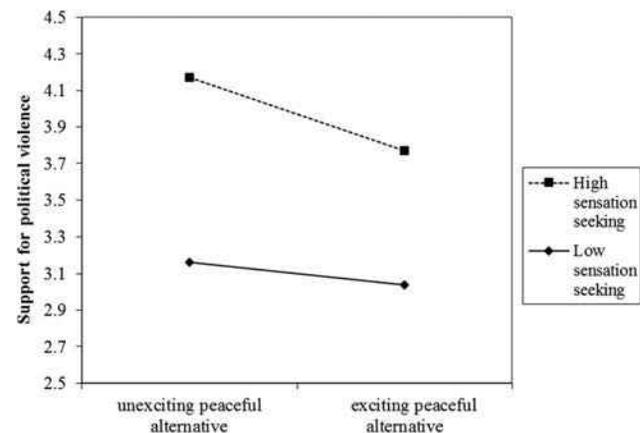


Figure 8. Interaction between sensation seeking and experimental condition (unexciting vs. exciting activist group) on support for political violence (Study 7).

accessible. Under such circumstances, violence is no longer the only means available to experience stimulating sensations and thus loses its appeal among high sensation seekers. Therefore, contrary to generally held beliefs, our research demonstrates that sensation seeking is not inevitably associated with support for political violence, it can be redirected toward prosocial and constructive activities. These findings substantiate the SQT's proposition that when the significance quest is activated "whether a prosocial or antisocial behavior is enacted should depend on the ideology that identifies the means to significance" (Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014, p. 79). This idea connects well with Katz's (1960) notion that attitudes have a function—they are means to psychological goals. In the present case, supporting extreme forms of activism (i.e., self-sacrifice and support for political violence) provides the stimulation and excitement that appear relevant to living a meaningful existence. However, as our research shows, extreme behaviors can be substituted with means that are functionally equivalent such as other exciting peaceful activities or groups.

Taken together, although scholars have mentioned the "need for adventure and significance" in the same breath (as if they were additive factors) to describe the motivational determinants of political extremism, in the present research, we articulated and adduced empirical evidence for a model that unpacks this proposition and demonstrate how these components are interrelated and part of a motivational process. Consequently, the present research builds on the SQT (e.g., Dugas et al., 2016; Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014) by (a) shedding light on a psychological mechanism that connects the search for meaning to extremism (i.e., self-sacrifice and support for political violence) and (b) underscoring how to redirect the quest for significance to reduce support for political violence. Of note, the current findings demonstrate only one out of several possible mechanisms that link the quest for significance to extreme outcomes (see Webber & Kruglanski, 2016). For instance, some individuals rather choose to restore their feelings of significance through personal and professional achievements.

**Sensation seeking theory.** The present research also contributes to the literature on sensation seeking in many ways. Indeed, although sensation seeking has been linked to aggressive behavior (Wilson & Scarpa, 2011), this is, to our knowledge, the first research demonstrating empirically the link between sensation seeking and political violence. This is noteworthy, as the scientific literature has put much emphasis on the relationship between sensation seeking and reactive, that is, more impulsive forms of violent behavior (e.g., criminal behavior or reckless driving; Bradley & Wildman, 2002; Horvath & Zuckerman, 1993; Jonah, 1997). However, the present research demonstrates that it also relates to violent behaviors connected to a greater ideological purpose. Therefore, our research corroborates recent findings that sensation seeking is not only related to reactive, but also proactive (i.e., planned) forms of aggressive behaviors (Cui, Colasante, Malti, Ribeaud, & Eisner, 2016; Pérez Fuentes, Molero Jurado, Carrión Martínez, Mercader Rubio, & Gázquez, 2016). Reactive and proactive forms of aggression (e.g., Dodge & Coie, 1987) operate differently: whereas reactive aggression is often an impulsive and emotional reaction to provocation, proactive aggression is deliberate and goal-directed. Hence, as shown in Study 7, interventions that provide substitute means (i.e., exciting and peaceful groups) to

reorient behavior toward a similar goal can be effective and, in this case, mitigate support for violence.

Another contribution of this work is that, although sensation seeking gradually changes over the life span, it is usually understood as a fairly stable biologically based personality trait (Zuckerman, 1974, 2007). The present research does not contend against the latter proposition but enriches it by providing additional evidence that there is room for momentary fluctuations in sensation seeking following short-lived experimental inductions (see also Fischer, Kastenmüller, & Asal, 2012; Gamble & Walker, 2016; Petrocelli, Martin, & Li, 2010), as adaptation to situational demands (Lynne-Landsman, Graber, Nichols, & Botvin, 2011; Parmak, Euwema, & Mylle, 2012), or as a result of intervention programs (e.g., Burnette et al., 2004). This was especially apparent in Studies 3 and 4 when after recalling events that either increased or decreased individuals' search for meaning, their desire for novel and stimulating experiences changed respectively. This evidence is consistent with Higgins' (2008) theoretical and empirically validated proposition that the concept of personality is simply "one source of variability in the functioning of psychological principles that also varies across momentary situations" (p. 612), which suggests that psychological constructs can be alternatively operationalized either as individual differences or as expressions of situational forces (e.g., Duggan, 2004; Kruglanski & Sheveland, 2012; Sturaro, Denissen, van Aken, & Asendorpf, 2008). It follows that our research demonstrates that sensation seeking is not simply a drive dictated by biological imperatives—it is also goal-driven as it steers individuals to explore and engage in novel activities in the pursuit of feeling significant. In this light, sensation seeking goes beyond wanting to experience a tingle to the spine; it can be understood as a self-regulatory mechanism triggered by the loss of significance. Therefore, the present research suggests that sensation seeking behaviors are not always the result of poor self-regulation (see also Taylor & Hamilton, 1997); quite the contrary, they can reflect people's ability to respond to the ongoing demands of experience in search of a meaningful existence.

## Practical Implications

Our findings also bear important practical implications for community-based organizations (e.g., Germany's Hayat program, Montreal's Center for the Prevention of Radicalization leading to Violence, Denmark's Aarhus program) whose purpose is to prevent and counter violent extremism by engaging individuals with strong political convictions spanning the full ideological spectrum (e.g., left- and right-wing extremism, eco-extremism, radical Islam, etc.).

**Detecting extremism.** Chief among the challenges that practitioners (e.g., social workers, psychologists) working for these organizations face, is identifying individuals that might be at risk of adhering to political violence so that preemptive efforts can be conducted to prevent their radicalization. The present research suggests being especially attentive to individuals that might be (a) in search for meaning and (b) display a proclivity for novel and intense experiences. Concretely, this means recognizing (a) personal situations that may increase one's likelihood of experiencing significance loss such as humiliation, disempowerment, and social stigmatization (Bélanger, 2013; Dugas et al., 2016; Webber, Klein, Kruglanski, Brizi, & Merari, 2017) and (b) individuals who tend to

be nonconformists and engage in behavior involving risk—two common indicators associated with high sensation seeking (Ang & Woo, 2003; Arnaut, 2006; Zuckerman, Bone, Neary, Mangelsdorff, & Brustman, 1972). Noting these telltale signs early on might be necessary for effective and timely prevention initiatives to steer people away from politically violent groups.

**Countermessaging strategies.** This raises the question of what these initiatives should be to prevent individuals' adherence to political violence. In recent years, one burgeoning field of initiatives has been countermessaging initiatives (also known as counternarratives) to fight for the "hearts and minds" of potential recruits for extremism. These initiatives typically consist of media campaigns on social media platforms aimed at tarnishing the brand of politically violent groups and their militant ideology to dissuade those that might be interested in joining their ranks.

Despite the widespread use of countermessaging by governments, NGOs, and grass-root movements (e.g., student-groups), one of the main issues concerning this approach is the absence of evidence supporting its effectiveness (see Davies, Neudecker, Ouellet, Bouchard, & Ducol, 2016; Ferguson, 2016; Hemmingsen & Castro, 2017). For the most part, this is attributable to the infancy of countermessaging as it relates to violent extremism—although the effectiveness of public-service- announcements (PSAs) on other sensitive topics (e.g., alcohol abuse, tobacco, unprotected sex) has also been widely debated (for meta-analyses see Derzon & Lipsey, 2002; Jepson, Harris, Platt, & Tannahill, 2010; Yadav & Kobayashi, 2015; Werb et al., 2011). In addition to this issue, a great concern is that most campaigns against political violence contain graphically violent scenes involving torture, executions, and corpses. For example, in the countermessaging campaign "Think again, turn away" launched by the United States Department of State, the viewers are exposed to blown-up mosques, suicide bombing, and other wanton acts of cruelty (Labott, 2014). This is troubling because this is the type of visual content that is highly attractive to sensation seekers (Zaleski, 1984; Zuckerman & Litle, 1986). Given the appeal of violent content to high sensation seekers, it is likely that the very messages aimed to deter young men from joining militant groups are the very messages that attract them. What the present research indicates is that if these countermessages are to be successful in decreasing support for political violence, it is mission critical to include peaceful and stimulating alternative social movements to get sensation seekers excited about prosocial (vs. violent) political causes. Merely imploring the viewers not to join these groups, to "say no to violence," might create *psychological reactance* (Brehm, 1966) and even elicit more destructive behaviors, especially if individuals already hold strong positive attitudes toward these groups, in which case other initiatives to counter violent extremism might be necessary.

**Countering extremism.** Over the years, a slew of initiatives has been proposed to help people disengage from politically violent groups. These typically include initiatives such as mentoring, creative arts, vocational training and sports (for a review see Koehler, 2016). However, as pointed out by some of the leading experts in the field, our understanding of the causal processes of disengagement from violent extremism remains speculative (Gill, Bouhana, & Morrison, 2015). This is attributable to (a) a general lack of theoretically grounded research in the field of counterradicalization and (b) the lack of evaluation to examine the impact of intervention methods to prevent or counter extremism (Horgan &

Braddock, 2010). Deradicalization, Koehler (2016) notes, "remains one of the most underresearched fields, which is even more surprising, as the connection to successful counter-terrorism, peace-keeping, and counter-radicalization policies is obvious" (p. 290). The research herein described contributes to this inchoate literature by providing "proof of concept" for a theory of change to reduce support for political violence—a working model that spells out the causal pathway to political violence for which interventions can be devised to truncate that process. Precisely, our research indicates that interventions to counter violent extremism should be geared either toward (a) helping individuals construct a meaningful personal narrative to quell the quest for significance or (b) redirecting their desire for thrilling sensations toward exciting prosocial groups (e.g., the Peace Corps or other NGOs conducting humanitarian work abroad, etc.). Clearly, more research is needed to evaluate the effectiveness of these programs and examine for whom these interventions are most effective.

## Conclusion

The present research extends recent work on Significance Quest Theory (Dugas et al., 2016; Kruglanski, Gelfand, Bélanger, Sheveland, et al., 2014) by demonstrating that sensation seeking is one psychological mechanism linking people's search for meaning to supporting extreme behaviors (e.g., support for political violence). When individuals search for meaning, they look for novel and intense experiences, thereby making them more likely to adhere to violent ideologies or groups.

Understanding these principles, we developed and successfully tested two interventions to thwart the radicalization process, namely (a) reducing people's search for meaning by guiding them to reflect on their personal, significance-providing, legacy and (b) providing an exciting—yet peaceful—alternative group that satisfies their need for exciting sensations. Both approaches are relevant to prevention and intervention efforts to mitigate support for political violence.

## References

- Aiken, L. S., & West, S. G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.
- Ang, R. P., & Woo, A. (2003). Influence of sensation seeking on boys' psychosocial adjustment. *North American Journal of Psychology, 5*, 121–136.
- Arbuckle, J. L. (2007). AMOS (Version 7) [Computer program]. Chicago, IL: SPSS.
- Arnaut, G. L. Y. (2006). Sensation seeking, risk taking, and fearlessness. In J. C. Thomas & D. L. Segal (Eds.), *Comprehensive handbook of personality and psychopathology* (pp. 322–344). New York, NY: Wiley.
- Arnett, J. (1995). The young and the reckless: Adolescent reckless behavior. *Current Directions in Psychological Science, 4*, 67–70. <http://dx.doi.org/10.1111/1467-8721.ep10772304>
- Arnett, J. (1998). Risk behavior and family role transitions during the twenties. *Journal of Youth and Adolescence, 27*, 301–320. <http://dx.doi.org/10.1023/A:1022851003328>
- Atran, S. (2014, September 4). Jihad's fatal attraction. *The Guardian*. Retrieved from <https://www.theguardian.com/commentisfree/2014/sep/04/jihad-fatal-attraction-challenge-democracies-isis-barbarism>
- Atran, S. (2015, April 23). *The role of youth in countering violent extremism and promoting peace*. Address to UN Security Council in Ministerial Debate.

- Atran, S., & Sheikh, H. (2015). Dangerous terrorists as devoted actors. In V. Zeigler-Hill, L. L. M. Welling, & T. K. Shackelford (Eds.), *Evolutionary perspectives on social psychology* (pp. 401–416). New York, NY: Springer. [http://dx.doi.org/10.1007/978-3-319-12697-5\\_31](http://dx.doi.org/10.1007/978-3-319-12697-5_31)
- Baumeister, R. F. (1991). *Escaping the self*. New York, NY: BasicBooks.
- Baumeister, R. F., & Campbell, W. K. (1999). The intrinsic appeal of evil: Sadism, sensational thrills, and threatened egotism. *Personality and Social Psychology Review*, 3, 210–221. [http://dx.doi.org/10.1207/s15327957pspr0303\\_4](http://dx.doi.org/10.1207/s15327957pspr0303_4)
- Bélangier, J. J. (2013). The psychology of martyrdom (Doctoral dissertation). University of Maryland, College Park, MD.
- Bélangier, J. J., Caouette, J., Sharvit, K., & Dugas, M. (2014). The psychology of martyrdom: Making the ultimate sacrifice in the name of a cause. *Journal of Personality and Social Psychology*, 107, 494–515. <http://dx.doi.org/10.1037/a0036855>
- Bélangier, J. J., Laffrenière, M.-A., Vallerand, R. J., & Kruglanski, A. W. (2013). When passion makes the heart grow colder: The role of passion in alternative goal suppression. *Journal of Personality and Social Psychology*, 104, 126–147. <http://dx.doi.org/10.1037/a0029679>
- Bélangier, J. J., Richardson, L., Lafrenière, M.-A. K., McCaffery, P., & Framand, K. (2017). *Support for extremist groups: Construct validity and psychometric properties of the social alienation and the normative beliefs toward political violence scales*. Unpublished Manuscript.
- Berlyne, D. E. (1960). *Conflict, arousal and curiosity*. New York, NY: McGraw-Hill. <http://dx.doi.org/10.1037/11164-000>
- Berlyne, D. E. (1971). *Aesthetics and psychobiology*. Englewood Cliffs, NJ: Prentice Hall.
- Boden, J. (2009). The devil inside: Boredom proneness and impulsive behavior. *Critical Studies*, 31, 203–226.
- Bradley, G., & Wildman, K. (2002). Psychosocial predictors of emerging adults' risk and reckless behaviors. *Journal of Youth and Adolescence*, 31, 253–265. <http://dx.doi.org/10.1023/A:1015441300026>
- Brassai, L., Piko, B. F., & Steger, M. F. (2011). Meaning in life: Is it a protective factor for adolescents' psychological health? *International Journal of Behavioral Medicine*, 18, 44–51. <http://dx.doi.org/10.1007/s12529-010-9089-6>
- Brehm, J. W. (1966). *A theory of psychological reactance*. New York, NY: Academic Press.
- Burnette, K. D., Swan, S., Robinson, K. D., Woods-Robinson, M., Robinson, K. D., & Little, G. L. (2004). Treating youthful offenders with moral reconnection therapy: A recidivism and pre-posttest analysis. *Cognitive Behavioral Treatment Review*, 3, 14–15.
- Canadian Security Intelligence Service. (2015). *Personality traits and terrorism* (Report No. 15–05). Canadian Network for Research on Terrorism, Security and Society.
- Cave, S. (2012). *Immortality: The quest to live forever and how it drives civilization*. New York, NY: Crown Publishers.
- Charnigo, R., Noar, S. M., Garnett, C., Crosby, R., Palmgreen, P., & Zimmerman, R. S. (2013). Sensation seeking and impulsivity: Combined associations with risky sexual behavior in a large sample of young adults. *Journal of Sex Research*, 50, 480–488. <http://dx.doi.org/10.1080/00224499.2011.652264>
- Cui, L., Colasante, T., Malti, T., Ribeaud, D., & Eisner, M. P. (2016). Dual trajectories of reactive and proactive aggression from mid-childhood to early adolescence: Relations to sensation seeking, risk taking, and moral reasoning. *Journal of Abnormal Child Psychology*, 44, 663–675. <http://dx.doi.org/10.1007/s10802-015-0079-7>
- Davies, G., Neudecker, C., Ouellet, M., Bouchard, M., & Ducol, B. (2016). Toward a framework understanding of online programs for countering violent extremism. *Journal for Deradicalization*, 6, 51–86. Retrieved from <http://journals.sfu.ca/jd/index.php/jd/article/view/43/0>
- Derzon, J. H., & Lipsey, M. W. (2002). A meta-analysis of the effectiveness of mass-communication for changing substance-use knowledge, attitudes, and behavior. In W. D. Crano & M. Burgoon (Eds.), *Mass media and drug prevention: Classic and contemporary theories and research* (pp. 231–258). Mahwah, NJ: Erlbaum.
- Dodge, K. A., & Coie, J. D. (1987). Social-information-processing factors in reactive and proactive aggression in children's peer groups. *Journal of Personality and Social Psychology*, 53, 1146–1158. <http://dx.doi.org/10.1037/0022-3514.53.6.1146>
- Donohew, L., Lorch, E. P., & Palmgreen, P. (1991). Sensation seeking and targeting of televised anti-drug PSAs. In L. Donohew, H. E. Sypher, & W. J. Bukoski (Eds.), *Persuasive communication and drug abuse prevention* (pp. 209–226). Hillsdale, NJ: Erlbaum.
- Dudley, M. G., Rostosky, S. S., Korfhage, B. A., & Zimmerman, R. S. (2004). Correlates of high-risk sexual behavior among young men who have sex with men. *AIDS Education and Prevention*, 16, 328–340. <http://dx.doi.org/10.1521/aeap.16.4.328.40397>
- Dugas, M., Bélangier, J. J., Moyano, M., Schumpe, B. M., Kruglanski, A. W., Gelfand, M. J., . . . Nociti, N. (2016). The Quest for Significance motivates self-sacrifice. *Motivation Science*, 2, 15–32. <http://dx.doi.org/10.1037/mot0000030>
- Duggan, C. (2004). Does personality change and, if so, what changes? *Criminal Behaviour and Mental Health*, 14, 5–16. <http://dx.doi.org/10.1002/cbm.556>
- Eysenck, H. J. (1963). *Experiments with drugs*. New York, NY: Pergamon Press.
- Eysenck, H. J. (1967). *The biological basis of personality*. Springfield, IL: Charles C. Thomas.
- Fahlman, S. A., Mercer, K. B., Gaskovski, P., Eastwood, A. E., & Eastwood, J. D. (2009). Does a lack of life meaning cause boredom? Results from psychometric, longitudinal, and experimental analyses. *Journal of Social and Clinical Psychology*, 28, 307–340. <http://dx.doi.org/10.1521/jscp.2009.28.3.307>
- Ferguson, K. (2016, March). *Countering violent extremism through media and communication strategies: A review of the evidence* [Research Report] Retrieved from the Partnership for Conflict, Crime & Security Research website <http://www.paccsresearch.org.uk/wpcontent/uploads/2016/03/Countering-Violent-Extremism-Through-Media-and-Communication-Strategies-.pdf>
- Fischer, P., Kastenmüller, A., & Asal, K. (2012). Ego depletion increases risk-taking. *The Journal of Social Psychology*, 152, 623–638. <http://dx.doi.org/10.1080/00224545.2012.683894>
- Fischer, S., & Smith, G. T. (2004). Deliberation affects risk taking beyond sensation seeking. *Personality and Individual Differences*, 36, 527–537. [http://dx.doi.org/10.1016/S0191-8869\(03\)00112-0](http://dx.doi.org/10.1016/S0191-8869(03)00112-0)
- Frankl, V. E. (1959). *Man's search for meaning*. Boston, MA: Beacon Press.
- Frankl, V. E. (1966). Logotherapy and existential analysis—A review. *American Journal of Psychotherapy*, 20, 252–260. <http://dx.doi.org/10.1176/appi.psychotherapy.1966.20.2.252>
- Gamble, T., & Walker, I. (2016). Wearing a bicycle helmet can increase risk taking and sensation seeking in adults. *Psychological Science*, 27, 289–294. <http://dx.doi.org/10.1177/0956797615620784>
- Gill, P., Bouhana, N., & Morrison, J. (2015). Individual disengagement from terrorist groups. In C. Kennedy-Pipe, G. Clubb, & S. Mabon (Eds.), *Terrorism and political violence* (pp. 243–257). London, UK: Sage.
- Gollob, H. F., & Reichardt, C. S. (1991). Interpreting and estimating indirect effects assuming time lags really matter. In L. M. Collins & J. L. Horn (Eds.), *Best methods for the analysis of change: Recent advances, unanswered questions, future directions* (pp. 243–259). Washington, DC: American Psychological Association. <http://dx.doi.org/10.1037/10099-015>
- Gomà-i-Freixanet, M., Pérez, J., & Torrubia, R. (1988). Personality variables in antisocial and prosocial disinhibitory behavior. In T. E. Moffitt & S. A. Mednick (Eds.), *Biological contributions to crime causation* (pp.

- 211–222). Dordrecht, The Netherlands: Nijhoff. [http://dx.doi.org/10.1007/978-94-009-2768-1\\_12](http://dx.doi.org/10.1007/978-94-009-2768-1_12)
- Goodman, J. S., & Blum, T. C. (1996). Assessing the nonrandom sampling effects of subject attrition in longitudinal research. *Journal of Management*, 22, 627–652. <http://dx.doi.org/10.1177/014920639602200405>
- Gray, J. A. (1964). Strength of the nervous system and levels of arousal: A reinterpretation. In J. A. Gray (Ed.), *Pavlov's typology* (pp. 289–364). New York, NY: MacMillan. <http://dx.doi.org/10.1016/B978-0-08-010076-0.50008-6>
- Ha, J., & Jang, S. (2015). Boredom and moderating variables for customers' novelty seeking. *Journal of Foodservice Business Research*, 18, 404–422. <http://dx.doi.org/10.1080/15378020.2015.1068675>
- Hacker, F. J. (1983). Dialectic interrelationships of personal and political factors in terrorism. In L. Z. Freedman & Y. Alexander (Eds.), *Perspectives on terrorism* (pp. 19–31). Wilmington, DE: Scholarly Resources, Inc.
- Heaven, P. C. L., & Ciarrochi, J. (2008). Parental styles, conscientiousness, and academic performance in high school: A three-wave longitudinal study. *Personality and Social Psychology Bulletin*, 34, 451–461. <http://dx.doi.org/10.1177/0146167207311909>
- Hemmingsen, A. S., & Castro, K. I. (2017). *The trouble with counter-narratives* (DIIS Report no. 1). Retrieved from the Danish Institute for International Studies website: [http://pure.diis.dk/ws/files/784884/DIIS\\_RP\\_2017\\_1.pdf](http://pure.diis.dk/ws/files/784884/DIIS_RP_2017_1.pdf)
- Higgins, E. T. (2008). Culture and personality: Variability across universal motives as the missing link. *Social and Personality Psychology Compass*, 2, 608–634. <http://dx.doi.org/10.1111/j.1751-9004.2007.00075.x>
- Holland, P. W. (1986). Statistics and causal inference. *Journal of the American Statistical Association*, 81, 945–960. <http://dx.doi.org/10.1080/01621459.1986.10478354>
- Horgan, J., & Braddock, K. (2010). Rehabilitating the terrorists?: Challenges in assessing the effectiveness of de-radicalization programs. *Terrorism and Political Violence*, 22, 267–291. <http://dx.doi.org/10.1080/09546551003594748>
- Horvath, P., & Zuckerman, M. (1993). Sensation seeking, risk appraisal, and risky behavior. *Personality and Individual Differences*, 14, 41–52. [http://dx.doi.org/10.1016/0191-8869\(93\)90173-Z](http://dx.doi.org/10.1016/0191-8869(93)90173-Z)
- Hoyle, R. H., Stephenson, M. T., Palmgreen, P., Lorch, E. P., & Donohew, R. L. (2002). Reliability and validity of a brief measure of sensation seeking. *Personality and Individual Differences*, 32, 401–414. [http://dx.doi.org/10.1016/S0191-8869\(01\)00032-0](http://dx.doi.org/10.1016/S0191-8869(01)00032-0)
- Institute for Economics and Peace. (2017). *Global terrorism index 2017: Measuring and understanding the impact of terrorism*. Retrieved from <http://visionofhumanity.org/app/uploads/2017/11/Global-Terrorism-Index-2017.pdf>
- Jack, S. J., & Ronan, K. R. (1998). Sensation seeking among high- and low-risk sports participants. *Personality and Individual Differences*, 25, 1063–1083. [http://dx.doi.org/10.1016/S0191-8869\(98\)00081-6](http://dx.doi.org/10.1016/S0191-8869(98)00081-6)
- Jepson, R. G., Harris, F. M., Platt, S., & Tannahill, C. (2010). The effectiveness of interventions to change six health behaviours: A review of reviews. *BMC Public Health*, 10, 538. <http://dx.doi.org/10.1186/1471-2458-10-538>
- Jessor, R. (1982). Problem behavior and developmental transition in adolescence. *Journal of School Health*, 52, 295–300. <http://dx.doi.org/10.1111/j.1746-1561.1982.tb04626.x>
- Jessor, R. (1991). Risk behavior in adolescence: A psychosocial framework for understanding and action. *Journal of Adolescent Health*, 12, 597–605. [http://dx.doi.org/10.1016/1054-139X\(91\)90007-K](http://dx.doi.org/10.1016/1054-139X(91)90007-K)
- Jonah, B. A. (1997). Sensation seeking and risky driving: A review and synthesis of the literature. *Accident Analysis and Prevention*, 29, 651–665. [http://dx.doi.org/10.1016/S0001-4575\(97\)00017-1](http://dx.doi.org/10.1016/S0001-4575(97)00017-1)
- Juergensmeyer, M. (2000). *Terror in the mind of God*. Berkeley, CA: University of California Press.
- Kalichman, S. C., Heckman, T., & Kelly, J. A. (1996). Sensation seeking as an explanation for the association between substance use and HIV-related risky sexual behavior. *Archives of Sexual Behavior*, 25, 141–154. <http://dx.doi.org/10.1007/BF02437933>
- Kashdan, T. B., & Steger, M. F. (2007). Curiosity and pathways to well-being and meaning in life: Traits, states, and everyday behaviors. *Motivation and Emotion*, 31, 159–173. <http://dx.doi.org/10.1007/s11031-007-9068-7>
- Katz, D. (1960). The functional approach to the study of attitudes. *Public Opinion Quarterly*, 24, 163–204. <http://dx.doi.org/10.1086/266945>
- Kellen, K. (1979). *Terrorists—what are they like? How some terrorists describe their world and actions*. Santa Monica, CA: RAND.
- Kenny, D. A., Kaniskan, B., & McCoach, D. B. (2015). The performance of RMSEA in models with small degrees of freedom. *Sociological Methods & Research*, 44, 486–507. <http://dx.doi.org/10.1177/0049124114543236>
- Koehler, D. (2016). *Understanding deradicalization. Methods, tools and programs for countering violent extremism*. New York, NY: Routledge.
- Köpetz, C. (2017). Risk and self-defeating behaviors as goal pursuit rather than regulatory failure. In C. E. Köpetz & A. Fishbach (Eds.), *The motivation-cognition interface* (pp. 124–148). New York, NY: Routledge.
- Kotre, J. (1999). *Make it count: How to generate a legacy that gives meaning to your life*. New York, NY: Free Press.
- Kruglanski, A. W., Bélanger, J. J., Gelfand, M., Gunaratna, R., Hettiarachchi, M., Reinares, F., . . . Sharvit, K. (2013). Terrorism—A (self) love story: Redirecting the significance quest can end violence. *American Psychologist*, 68, 559–575. <http://dx.doi.org/10.1037/a0032615>
- Kruglanski, A. W., Chen, X., Dechesne, M., Fishman, S., & Orehek, E. (2009). Fully committed: Suicide bombers' motivation and the quest for personal significance. *Political Psychology*, 30, 331–357. <http://dx.doi.org/10.1111/j.1467-9221.2009.00698.x>
- Kruglanski, A. W., Chernikova, M., Babush, M., Dugas, M., & Schumpe, B. M. (2015). The architecture of goal systems: Multifinality, equifinality, and counterfinality in means–end relations. In A. J. Elliot (Ed.), *Advances in motivation science* (pp. 69–98). Waltham, MA: Academic Press. <http://dx.doi.org/10.1016/bs.adms.2015.04.001>
- Kruglanski, A. W., & Fishman, S. (2006). The psychology of terrorism: “Syndrome” versus “tool” perspectives. *Terrorism and Political Violence*, 18, 193–215. <http://dx.doi.org/10.1080/09546550600570119>
- Kruglanski, A. W., Gelfand, M. J., Bélanger, J. J., Gunaratna, R., & Hettiarachchi, M. (2014). Deradicalizing the Liberation Tigers of Tamil Eelam (LTTE): Some preliminary findings. In A. Silke (Ed.), *Prisons, terrorism and extremism: Critical issues in management, radicalization and reform* (pp. 183–196). London, UK: Routledge.
- Kruglanski, A. W., Gelfand, M. J., Bélanger, J. J., Sheveland, A., Hettiarachchi, M., & Gunaratna, R. (2014). The psychology of radicalization and deradicalization: How significance quest impacts violent extremism. *Political Psychology*, 35, 69–93. <http://dx.doi.org/10.1111/pops.12163>
- Kruglanski, A. W., & Orehek, E. (2011). The role of the quest for personal significance in motivating terrorism. In J. Forgas, A. Kruglanski, & K. Williams (Eds.), *The psychology of social conflict and aggression* (pp. 153–166). New York, NY: Psychology Press.
- Kruglanski, A. W., Shah, J. Y., Fishbach, A., Friedman, R., Chun, W. Y., & Sleeth-Keppler, D. (2002). A theory of goal systems. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 331–376). New York, NY: Academic Press.
- Kruglanski, A. W., & Sheveland, A. (2012). Thinkers' personalities: On individual differences in the processes of sense making. In S. T. Fiske & C. N. Macrae (Eds.), *The SAGE handbook of social cognition* (pp. 474–494). London, UK: Sage Limited. <http://dx.doi.org/10.4135/9781446247631.n24>
- Labott, E. (2014, September 8). State Department releases graphic anti-ISIS video. *CNN World*. Retrieved from <https://www.cnn.com/2014/09/05/world/state-department-anti-isis-video/index.html>

- Lavigne, K. M., Hofman, S., Ring, A. J., Ryder, A. G., & Woodward, T. S. (2013). The personality of meaning in life: Associations between dimensions of life meaning and the Big Five. *The Journal of Positive Psychology, 8*, 34–43. <http://dx.doi.org/10.1080/17439760.2012.736527>
- Levine, S. (1999). Youths in terroristic groups, gangs and cults: The allure, the animus, and the alienation. *Psychiatric Annals, 29*, 342–349. <http://dx.doi.org/10.3928/0048-5713-19990601-08>
- Lewin, K. (1947). Frontiers in group dynamics: concept, method and reality in social science; social equilibria and social change. *Human Relations, 1*, 5–41.
- Lorch, E. P., Palmgreen, P., Donohew, L., Helm, D., Baer, S. A., & D'Silvia, M. O. (1994). Program context, sensation seeking, and attention to televised anti-drug public service announcements. *Human Communication Research, 20*, 390–412. <http://dx.doi.org/10.1111/j.1468-2958.1994.tb00328.x>
- Lynne-Landsman, S. D., Graber, J. A., Nichols, T. R., & Botvin, G. J. (2011). Is sensation seeking a stable trait or does it change over time? *Journal of Youth and Adolescence, 40*, 48–58. <http://dx.doi.org/10.1007/s10964-010-9529-2>
- Martin, L. L. (1999). I-D Compensation Theory: Some implications of trying to satisfy immediate-return needs in a delayed-return culture. *Psychological Inquiry, 10*, 195–208. [http://dx.doi.org/10.1207/S15327965PLI1003\\_1](http://dx.doi.org/10.1207/S15327965PLI1003_1)
- Melton, A. M., & Schulenberg, S. E. (2007). On the relationship between meaning in life and boredom proneness: Examining a logotherapy postulate. *Psychological Reports, 101*, 1016–1022.
- Miller, E. (2017). *Overview: Terrorism in 2016*. Retrieved from <http://www.start.umd.edu/publication/overview-terrorism-2016>
- Miller, R. B., & Hollist, C. S. (2007). Attrition bias. In N. Salkind (Ed.), *Encyclopedia of measurement and statistics* (Vol. 1, pp. 57–60). Thousand Oaks, CA: SAGE. Retrieved from <http://digitalcommons.unl.edu/famconfacpub/45>
- Montag, I., & Birenbaum, M. (1986). Psychopathological factors and sensation seeking. *Journal of Research in Personality, 20*, 338–348. [http://dx.doi.org/10.1016/0092-6566\(86\)90139-X](http://dx.doi.org/10.1016/0092-6566(86)90139-X)
- Newcomb, M. D., & McGee, L. (1991). Influence of sensation seeking on general deviance and specific problem behaviors from adolescence to young adulthood. *Journal of Personality and Social Psychology, 61*, 614–628. <http://dx.doi.org/10.1037/0022-3514.61.4.614>
- Nussio, E. (2017). The role of sensation seeking in violent armed group participation. *Terrorism and Political Violence. Advance online publication*. <http://dx.doi.org/10.1080/09546553.2017.1342633>
- Palmgreen, P., & Donohew, L. (2010). Impact of SENTAR on prevention campaign policy and practice. *Health Communication, 25*, 609–610. <http://dx.doi.org/10.1080/10410236.2010.496843>
- Palmgreen, P., Donohew, L., Lorch, E. P., Hoyle, R. H., & Stephenson, M. T. (2001). Television campaigns and adolescent marijuana use: Tests of sensation seeking targeting. *American Journal of Public Health, 91*, 292–296. <http://dx.doi.org/10.2105/AJPH.91.2.292>
- Palmgreen, P., Lorch, E. P., Donohew, L., Harrington, N. G., D'Silva, M., & Helm, D. (1995). Reaching at-risk populations in a mass media drug abuse prevention campaign: Sensation seeking as a targeting variable. *Drugs & Society, 8*, 29–45. [http://dx.doi.org/10.1300/J023v08n03\\_04](http://dx.doi.org/10.1300/J023v08n03_04)
- Palmgreen, P., Lorch, E. P., Stephenson, M. T., Hoyle, R. H., & Donohew, L. (2007). Effects of the office of national drug control policy's marijuana initiative campaign on high-sensation-seeking adolescents. *American Journal of Public Health, 97*, 1644–1649. <http://dx.doi.org/10.2105/AJPH.2005.072843>
- Parmak, M., Euwema, M. C., & Mylly, J. J. C. (2012). Changes in sensation seeking and need for structure before and after combat deployment. *Military Psychology, 24*, 551–564. <http://dx.doi.org/10.1080/08995605.2012.742843>
- Pérez, J., & Torrubia, R. (1985). Sensation seeking and antisocial behavior in a student sample. *Personality and Individual Differences, 6*, 401–403. [http://dx.doi.org/10.1016/0191-8869\(85\)90068-6](http://dx.doi.org/10.1016/0191-8869(85)90068-6)
- Pérez Fuentes, M. D. C., Molero Jurado, M. D. M., Carrión Martínez, J. J., Mercader Rubio, I., & Gázquez, J. J. (2016). Sensation-Seeking and Impulsivity as Predictors of Reactive and Proactive Aggression in Adolescents. *Frontiers in Psychology, 7*, 1447. <http://dx.doi.org/10.3389/fpsyg.2016.01447>
- Petrocelli, J. V., Martin, J. L., & Li, W. Y. (2010). Shaping behavior through malleable self-perceptions: A test of the forced-agreement scale effect (FASE). *Journal of Research in Personality, 44*, 213–221. <http://dx.doi.org/10.1016/j.jrp.2010.01.003>
- Preacher, K. J., & Hayes, A. F. (2008). Asymptotic and resampling strategies for assessing and comparing indirect effects in multiple mediator models. *Behavior Research Methods, 40*, 879–891. <http://dx.doi.org/10.3758/BRM.40.3.879>
- Roberti, J. W. (2004). A review of behavioral and biological correlates of sensation seeking. *Journal of Research in Personality, 38*, 256–279. [http://dx.doi.org/10.1016/S0092-6566\(03\)00067-9](http://dx.doi.org/10.1016/S0092-6566(03)00067-9)
- Russell, G. W. (2004). Sports riots: A social-psychological review. *Aggression and Violent Behavior, 9*, 353–378. [http://dx.doi.org/10.1016/S1359-1789\(03\)00031-4](http://dx.doi.org/10.1016/S1359-1789(03)00031-4)
- Russell, G. W., & Arms, R. L. (1998). Toward a social psychological profile of would-be rioters. *Aggressive Behavior, 24*, 219–226. [http://dx.doi.org/10.1002/\(SICI\)1098-2337\(1998\)24:3<219::AID-AB6>3.0.CO;2-F](http://dx.doi.org/10.1002/(SICI)1098-2337(1998)24:3<219::AID-AB6>3.0.CO;2-F)
- Schein, E. H. (1996). Kurt Lewin's change theory in the field and in the classroom: Notes toward a model of managed learning. *Systems Practice, 9*, 27–47. <http://dx.doi.org/10.1007/BF02173417>
- Schoemann, A. M., Boulton, A. J., & Short, S. D. (2017). Determining power and sample size for simple and complex mediation models. *Social Psychological and Personality Science, 8*, 379–386. <http://dx.doi.org/10.1177/1948550617715068>
- Sharp, G. (1973). *The politics of nonviolent action: The methods of nonviolent action*. Boston: P. Sargent Publisher.
- Shek, D. T., Ma, H. K., & Cheung, P. C. (1994). Meaning in life and adolescent antisocial and prosocial behavior in Chinese context. *Psychologia, 37*, 211–218.
- Smith, R. P. (1981). Boredom: A review. *Human Factors, 23*, 329–340. <http://dx.doi.org/10.1177/001872088102300308>
- Sobel, M. E. (1990). Effect analysis and causation in linear structural equation models. *Psychometrika, 55*, 495–515. <http://dx.doi.org/10.1007/BF02294763>
- Soenens, B., Luyckx, K., Vansteenkiste, M., Luyten, P., Duriez, B., & Goossens, L. (2008). Maladaptive perfectionism as an intervening variable between psychological control and adolescent depressive symptoms: A three-wave longitudinal study. *Journal of Family Psychology, 22*, 465–474. <http://dx.doi.org/10.1037/0893-3200.22.3.465>
- Steger, M. F., Frazier, P., Oishi, S., & Kaler, M. (2006). The meaning in life questionnaire: Assessing the presence of and search for meaning in life. *Journal of Counseling Psychology, 53*, 80–93. <http://dx.doi.org/10.1037/0022-0167.53.1.80>
- Sturaro, C., Denissen, J. J. A., van Aken, M. A. G., & Asendorpf, J. B. (2008). Person-environment transactions during emerging adulthood. *European Psychologist, 13*, 1–11. <http://dx.doi.org/10.1027/1016-9040.13.1.1>
- Taubman-Ben-Ari, O. (2004). Risk taking in adolescence. In J. Greenberg, S. L. Koole, & T. Pyszczynski (Eds.), *Handbook of experimental existential psychology* (pp. 106–124). New York, NY: Guilford Press.
- Taubman-Ben-Ari, O. (2011). Is the meaning of life also the meaning of death? A terror management perspective reply. *Journal of Happiness Studies, 12*, 385–399. <http://dx.doi.org/10.1007/s10902-010-9201-2>
- Taubman-Ben-Ari, O., Eherenfreund-Hager, A., & Prato, C. G. (2016). The value of self-report measures as indicators of driving behaviors among young drivers. *Transportation Research Part F: Traffic Psychol-*

- ogy and Behaviour, 39, 33–42. <http://dx.doi.org/10.1016/j.trf.2016.03.005>
- Taylor, R. L., III, & Hamilton, J. C. (1997). Preliminary evidence for the role of self-regulatory processes in sensation seeking. *Anxiety, Stress, and Coping, 10*, 351–375. <http://dx.doi.org/10.1080/10615809708249309>
- United Nations Security Council. (2015). *Analysis and recommendations with regard to the global threat from foreign terrorist fighters*. Retrieved from [http://www.un.org/en/sc/ctc/docs/2015/N1508457\\_EN.pdf](http://www.un.org/en/sc/ctc/docs/2015/N1508457_EN.pdf)
- Upal, M. A. (2015). Confronting Islamic Jihadist movements. *Journal of Terrorism Research, 6*, 57–69. <http://dx.doi.org/10.15664/jtr.1155>
- Victoroff, J. (2005). The mind of the terrorist. A review and critique of psychological Approaches. *Journal of Conflict Resolution, 49*, 3–42. <http://dx.doi.org/10.1177/0022002704272040>
- Webber, D., Babush, M., Schori-Eyal, N., Vazeou-Nieuwenhuis, A., Hettiarachchi, M., Bélanger, J. J., . . . Gelfand, M. J. (2018). The road to extremism: Field and experimental evidence that significance loss-induced need for closure fosters radicalization. *Journal of Personality and Social Psychology, 114*, 270–285. <http://dx.doi.org/10.1037/pspi0000111>
- Webber, D., Klein, K., Kruglanski, A., Brizi, A., & Merari, A. (2017). Divergent Paths to Martyrdom and Significance Among Suicide Attackers. *Terrorism and Political Violence, 29*(5), 852–874. <http://dx.doi.org/10.1080/09546553.2015.1075979>
- Webber, D., & Kruglanski, A. W. (2016). Psychological factors in radicalization: A “3N” approach. In G. LaFree & J. D. Freilich (Eds.), *The handbook of the criminology of terrorism* (pp. 33–46). Hoboken, NJ: Wiley. <http://dx.doi.org/10.1002/9781118923986.ch2>
- Weiss, R. E. (2005). *Modeling longitudinal data*. New York, NY: Springer.
- Werb, D., Mills, E. J., Debeck, K., Kerr, T., Montaner, J. S. G., & Wood, E. (2011). The effectiveness of anti-illicit-drug public-service announcements: A systematic review and meta-analysis. *Journal of Epidemiology and Community Health, 65*, 834–840. <http://dx.doi.org/10.1136/jech.2010.125195>
- Wiktorowicz, Q. (2005). *Radical Islam Rising: Muslim extremism in the west*. Oxford, UK: Rowman & Littlefield Publishers, Inc.
- Wilson, L. C., & Scarpa, A. (2011). The link between sensation seeking and aggression: A meta-analytic review. *Aggressive Behavior, 37*, 81–90. <http://dx.doi.org/10.1002/ab.20369>
- Yadav, R.-P., & Kobayashi, M. (2015). A systematic review: Effectiveness of mass media campaigns for reducing alcohol-impaired driving and alcohol-related crashes. *BMC Public Health, 15*, 857. <http://dx.doi.org/10.1186/s12889-015-2088-4>
- Zaleski, Z. (1984). Sensation seeking and preference for emotional and visual stimuli. *Personality and Individual Differences, 5*, 609–611. [http://dx.doi.org/10.1016/0191-8869\(84\)90040-0](http://dx.doi.org/10.1016/0191-8869(84)90040-0)
- Zand, D. E., & Sorensen, R. E. (1975). Theory of change and the effective use of management science. *Administrative Science Quarterly, 20*, 532–545. <http://dx.doi.org/10.2307/2392021>
- Zimbardo, P., & Coulombe, N. D. (2016). *Man, interrupted: Why young men are struggling & what we can do about it*. Newburyport, MA: Conari Press.
- Zimbardo, P. G., Ferreras, A. C., & Brunskill, S. R. (2015). Social intensity syndrome: The development and validation of the social intensity syndrome scale. *Personality and Individual Differences, 73*, 17–23. <http://dx.doi.org/10.1016/j.paid.2014.09.014>
- Zimmerman, R. S., Palmgreen, P. M., Noar, S. M., Lustria, M. L. A., Lu, H. Y., & Lee Horosewski, M. (2007). Effects of a televised two-city safer sex mass media campaign targeting high-sensation-seeking and impulsive-decision-making young adults. *Health Education & Behavior, 34*, 810–826. <http://dx.doi.org/10.1177/1090198107299700>
- Zuckerman, M. (1969). Variables affecting deprivation results. In J. P. Zubek (Ed.), *Sensory deprivation: Fifteen years of research* (pp. 47–84). New York, NY: Appleton-Century-Crofts.
- Zuckerman, M. (1974). The sensation seeking motive. In B. A. Maher (Ed.), *Progress in experimental personality research* (Vol. 7, pp. 79–148). New York, NY: Academic Press.
- Zuckerman, M. (1979). *Sensation seeking: Beyond the optimal level of arousal*. Hillsdale, NJ: Erlbaum.
- Zuckerman, M. (1983). Sensation seeking and sports. *Personality and Individual Differences, 4*, 285–292. [http://dx.doi.org/10.1016/0191-8869\(83\)90150-2](http://dx.doi.org/10.1016/0191-8869(83)90150-2)
- Zuckerman, M. (1994). *Behavioral expressions and biosocial bases of sensation seeking*. New York, NY: Cambridge University Press.
- Zuckerman, M. (2007). *Sensation seeking and risky behavior*. Washington, DC: American Psychological Association. <http://dx.doi.org/10.1037/11555-000>
- Zuckerman, M., Bone, R. N., Neary, R., Mangelsdorff, D., & Brustman, B. (1972). What is the sensation seeker? Personality trait and experience correlates of the Sensation-Seeking Scales. *Journal of Consulting and Clinical Psychology, 39*, 308–321. <http://dx.doi.org/10.1037/h0033398>
- Zuckerman, M., Eysenck, S., & Eysenck, H. J. (1978). Sensation seeking in England and America: Cross-cultural, age, and sex comparisons. *Journal of Consulting and Clinical Psychology, 46*, 139–149. <http://dx.doi.org/10.1037/0022-006X.46.1.139>
- Zuckerman, M., Kolin, E. A., Price, L., & Zoob, I. (1964). Development of a sensation seeking scale. *Journal of Consulting Psychology, 28*, 477–482. <http://dx.doi.org/10.1037/h0040995>
- Zuckerman, M., & Litle, P. (1986). Personality and curiosity about morbid and sexual events. *Personality and Individual Differences, 7*, 49–56. [http://dx.doi.org/10.1016/0191-8869\(86\)90107-8](http://dx.doi.org/10.1016/0191-8869(86)90107-8)

Received March 8, 2018

Revision received July 14, 2018

Accepted August 27, 2018 ■