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# Seeing through Troubled Water: Proposing a Narrow Focus on Behavioral Warning Signals for the Prevention of Terrorist Violence

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## ABSTRACT

Prevention strategies for terrorist attacks commonly incorporate all aspects of radicalization, aiming to deter terrorist attacks by countering radical beliefs. In this article, however, we argue that the cognitive aspect of radicalization is not necessarily interconnected with its behavioral aspect and thus cannot reliably predict terrorist violence. It is therefore necessary to distinguish between them in prevention efforts, and to differentiate them from cognitive and behavioral extremism. We specifically discuss the Attitudes-Behaviors Corrective model, a recent model conceptualizing the distinction between cognitive and behavioral extremism. This model additionally theorizes what might be driving behavioral extremism, independent from cognitive extremism. We explore how prevention efforts diminish in accuracy when conflating extremist beliefs and actions and propose that utilizing behavioral warning signals might provide an encouraging solution. Empirical studies indicate that behavioral indicators might be able to detect those who are planning violent terrorist acts and show promising capacity for their use in threat assessment. We review two threat assessment tools using behavioral warning signs, the TRAP-18 and LATERAN-IT, and conclude that these tools seem capable of identifying those who are planning terrorist violence. More research is needed to further validate and eventually implement these tools in the prevention of terrorist attacks.

## KEYWORDS

Cognitive radicalization; behavioral radicalization; extremism; threat assessment; behavioral warning signals; leaking

## Introduction

On July 14, 2016, a Tunisian-born man drove a rented truck into the crowd of spectators returning from the Bastille Day fireworks in Nice, France. His grueling ride resulted in 86 deaths and 458 injured. While some French politicians argued that the perpetrator was “connected to radical Islam in some way or another,”<sup>1</sup> subsequent investigation revealed that he was not known to be a radicalized or even devout Muslim. Despite intensive counterterrorism measures, the French authorities had not identified the attacker as a potential threat. In the months following the attack, it became increasingly clear that the perpetrator had been planning his attack for up to a year.<sup>2</sup> Yet, he only returned to practicing Islam three months before the attack, and signs of religious radicalization emerged just two weeks prior to the incident. It therefore appears that the planning of the attack preceded the attacker’s ideological radicalization.<sup>3</sup> This case illustrates an emerging insight in the field of radicalization and terrorism: Adherence to a radical ideology might not always be an antecedent of committing a terrorist attack, and the assumption that it does might be hindering prevention efforts.<sup>4</sup>

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Just as perpetrators of terrorist acts may not be driven solely by radicalized opinions, radicalized individuals will not unequivocally turn into terrorists. That is, most radicalized individuals will not endorse violence as a justified means of advancing their radical beliefs; let alone become involved with or commit violence for a terrorist cause.<sup>5</sup> Empirical studies find that although up to 30–40 percent of Muslim Americans adopt a literalist interpretation of Islam, only 8 percent would argue that violence in defense of Islam is sometimes justified, with a mere 0.01 percent engaging in terrorist activity themselves.<sup>6</sup> These findings attest that more commonly than not, holding radical opinions does not necessarily increase a willingness to engage in, or even support, terrorist violence. Hence, radicalized attitudes appear to be a poor predictor of whether somebody will engage in terrorist violence. Yet, it has been observed that radicalization seems to be used as a proxy measure for the commission of violent terrorist attacks in their prevention.<sup>7</sup> The current paper therefore proposes that the conflation of attitudes and behaviors is harmful to prevention methods for terrorist attacks. In this regard, we further distinguish between radical beliefs and actions to clearly define and demarcate the risk specification that prevention methods need to adopt.

Distinguishing between radical attitudes and behaviors is essential to evaluating the danger someone poses. As argued by Horgan, as well as Schuurman and Eijkman,<sup>8</sup> radical beliefs being held by a few members of society can to some extent be considered a healthy and necessary element of a democracy. Since radical beliefs encompass opinions that advocate for fundamental societal changes without necessarily accepting violence in support of such change, they have the capacity of promoting moral progress.<sup>9</sup> The presence of relatively radical beliefs only turns potentially harmful when individuals perceive violence as justified in pursuing these beliefs. This state of violent radicalism is usually termed “extremism” in the terrorism literature.<sup>10</sup> However, for the potential harm of extremism to materialize, extremist individuals still need to decide to act on their violent radical beliefs. This can be realized, for instance, by joining and supporting a terrorist organization. Nonetheless, even within a terrorist organization, an individual could convert their extremist beliefs into action without necessarily committing further crimes or acts of violence. Research shows that the roles within a terrorist organization vary, from logistical support or non-violent criminal activities for financing the organization, to directly contributing to preparing and perpetrating violent attacks.<sup>11</sup> These different roles, and specifically the willingness to participate in violence, correlate with different factors and are driven by different motivations.<sup>12</sup> In the prevention of extremist violence, it is therefore important to limit the meaning of “violent acts” to those acts that directly contribute to violence through its planning or execution. Given these complexities, it is crucial for academics, policy makers and police services to specify who and what they mean with “terrorists” and “preventing terrorism.”

The current paper aims to untangle these conceptual complexities and delineate what it is we are trying to detect and prevent. Once the focus of prevention efforts is more clearly demarcated, the distinction between the attitudinal and behavioral dimensions of radicalization and extremism will be further explored through various theoretical perspectives. These suggest that common risk specifications are too vague, thus diminishing accuracy in identifying those who are most at risk of committing an attack, which restricts an optimal allocation of prevention measures. We will review evidence from empirical studies showing that tailoring prevention efforts can be achieved through using behavioral signs of attack preparation. Lastly, the paper will examine promising novel prevention methods based on these behavioral warning signs. The paper concludes by advocating for a departure from generalized prevention methods for radicalization, instead proposing a shift towards a more clearly specified risk outcome and a novel behavior-centered prevention approach.

## Demarcating the risk specification

As put forward by various experts in the fields of risk assessment, threat assessment and terrorism prevention,<sup>13</sup> it is imperative to precisely define and specify what exactly the focus of prevention efforts is. In the broadest sense, the risk specification is, of course, “terrorism.” The current paper adopts the revised “academic consensus” definition of terrorism as formulated by Schmid:<sup>14</sup>

“Terrorism refers, on the one hand, to a doctrine about the presumed effectiveness of a special form or tactic of fear-generating, coercive political violence and, on the other hand, to a conspiratorial practice of calculated, demonstrative, direct violent action without legal or moral restraints, targeting mainly civilians and non-combatants, performed for its propagandistic and psychological effects on various audiences and conflict parties.” Although this definition includes state actions as a form of terrorism, the current paper follows the approach described by Krueger and Malečková,<sup>15</sup> focusing solely on the actions of non-state actors. It is presumed that the processes underlying state terrorism differ from those underlying terrorism by non-state actors,<sup>16</sup> hence necessitating distinct data and prevention methods. In addition, the current paper is not specifically aimed at any ideology or form of radicalization, and thus its arguments can be applied to all extremist violence.

A term describing the process that is assumed to precede the commission of terrorist acts, is radicalization. This term has come to dominate debates on terrorism involvement in the last two decades<sup>17</sup> and was introduced as a way of understanding and explaining what brings individuals to pursue their goals through violently attacking and murdering innocent civilians. Attempts at defining radicalization are numerous and varied and usually characterize it as a process that can, but does not have to, lead people to become involved in radical, extremist or terrorist movements and actions.<sup>18</sup> However, the term remains contentious. As Neumann points out, radicalization is an inherently context-dependent concept.<sup>19</sup> Its main criticisms are that radicalization is a vague concept that continues to be understood in a variety of different ways<sup>20</sup> and that it conflates distinct concepts, such as the behavioral and ideological aspect of radicalization.<sup>21</sup> As radicalization was coined as a way to understand violent terrorist acts, its definitions implicitly or explicitly assume that radical beliefs predate and lead to terrorist involvement. This assumption is problematic for prevention efforts, since most radicalized individuals never become involved in terrorism and not all terrorists are predominantly driven by their beliefs, as they also have been motivated by economic frustration, alienation, and group membership.<sup>22</sup>

Through this presumption, radicalization is often used in a way that confuses attitudes and cognitions with actions and behavior, intuitively expecting these to be associated. However, psychological studies have shown that the relation between attitudes and behavior is affected heavily by external variables, such as perceived behavioral control and subjective norms, leaving the direct link between attitudes and behavior quite weak.<sup>23</sup> For that reason, scholars have proposed to disentangle attitudes and actions by distinguishing between cognitive and behavioral radicalization.<sup>24</sup> As can be seen in Table 1, in this taxonomy, cognitive radicalization entails the adoption of radical beliefs, which can be described as ideas that promote fundamental changes in society, without necessarily accepting violence in pursuit of such ends. Examples of this would be supporting the instalment of a Sharia state or believing that Caucasians are superior and should have more rights than other people. However, an individual who is cognitively but not behaviorally radicalized would not act in accordance with these beliefs. Inversely, behavioral radicalization encompasses the execution of actions in support of a radical cause. Such actions can transpire on an individual level, such as making hiring decisions based on candidates’ ethnicity, and on a community level, such as going into politics to advocate for these opinions. Many individuals might hold these radical opinions, yet do not let their behavior be

**Table 1.** Distinction between cognitive radicalization, behavioral radicalization, cognitive extremism, and behavioral extremism

|                         | Attitudes                                                                                                                                             | Action                                                                                                                                                            |
|-------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| No violence necessarily | <b>Cognitive radicalization</b><br>= adopting radical beliefs that are not necessarily violent.<br>For example, endorsing Sharia law to be installed. | <b>Behavioral radicalization</b><br>= taking actions in support of radical beliefs.<br>For example, organizing a protest; recruitment for terrorist organization. |
| Acceptance of violence  | <b>Cognitive extremism</b><br>= adopting extremist, violent attitudes.<br>For example, supporting a violent coup to install Sharia law.               | <b>Behavioral extremism</b><br>= taking actions in support of violent extremist ideas.<br>For example, providing weapons for a terrorist attack.                  |

influenced by these, as actions are the result of a complex interplay of attitudes and external factors, such as means, opportunities, and social norms.<sup>25</sup>

Since radicalization in its traditional interpretation can be violent or non-violent, actions in support of it can be violent or non-violent too, encompassing peaceful protests, founding a political party, and financing or recruiting for terrorist organizations. Therefore, it is crucial to further differentiate the adoption of radical ideas and actions from the opinion that it is justified and necessary to use violence in the pursuit of these ideas, which is usually understood as extremism in terrorism literature,<sup>26</sup> as can be seen in Table 1. Here again, it is imperative to distinguish between the opinion that employing violence is justified versus actively abetting or committing violence to support a cause. In retaining consistent terminology, these can be coined cognitive extremism and behavioral extremism. Cognitive extremism, then, would entail holding the belief that violence in support of radical and extreme ideas would be justified, without necessarily contributing to this violence. Behavioral extremism indicates an individual displays actions that knowingly contribute towards violence for a cause, such as purchasing weapons for a confederate, or committing violence themselves. An overview of the four distinctions can be found in Table 1.

Most often, behavioral extremism is accompanied by some level of cognitive extremism. However, they do not necessarily have to coincide, which is attested by empirical data on extremists who have and have not used violence.<sup>27</sup> Jaskoski and colleagues interviewed 129 former radicals and extremists from twelve different countries, of whom 30 had committed violence themselves.<sup>28</sup> The percentages of people in these groups who supported violence was high and highly similar in both groups (87 percent of those who had formerly used violence versus 76 percent of those who had not used violence). The number of interviewees mentioning grievances was also nearly identical between the two groups (73 percent of those who had used violence versus 81 percent of those who had not used violence). These data show that the use of violence is accepted and supported by many individuals who did not participate in it themselves, indicating that the differentiation between cognitive and behavioral extremism is helpful in distinguishing between these groups.

In addition to discerning between actions and beliefs in radicalization and extremism, it is necessary for prevention efforts to narrow the focus to those actions that would cause direct harm to others.<sup>29</sup> Therefore, Schuurman and Taylor as well as Taylor and Horgan have proposed to differentiate between the types of actions individuals can undertake in support of their radicalized or extreme beliefs,<sup>30</sup> in line with general criminological theories. The first type of actions one can undertake are involvement decisions. This refers to the general decision to become involved in a certain form of crime or a criminal group. In a terrorist context, this could entail the more general decision to attend meetings of a terrorist network, to contribute financially, or to refer others to the group. These decisions contrast with event decisions, which involve decision processes regarding the commission of a particular crime, in this case perpetrating a terrorist attack. The current paper adopts an understanding of event decisions as decisions taken to aid in the planning or commission of violent terrorist acts, as it provides a helpful demarcation between the decision to be simply involved with a criminal organization and the decision to actively support the violent crimes this group commits.

In contrast, some authors have criticized the compartmentalization of radicalization and extremism and have argued that they should be studied holistically.<sup>31</sup> Neumann contends that the justification of violence is an inherent component of ideology and that it dictates why one group chooses peaceful resistance while another group chooses the tactic of committing terrorist attacks.<sup>32</sup> It might be true that, on a group level, ideologies can explain why a movement does or does not turn violent, yet it has not successfully been established how ideology could account for why one individual within a group participates in violence while another does not. Some authors even hold that prior experience with committing violence actually precedes engagement with extremist ideology,<sup>33</sup> and thus the countering of ideologies would not prevent engagement in violence. Nevertheless, both ideological aspects and behavioral aspects of extremism are currently countered from a security perspective in most countries. The interception and intervention of terrorist attacks commonly fall under counterterrorism efforts, whilst more cognitive aspects of

radicalization and extremism fall under counter-radicalization efforts. This addressal of social issues from a security perspective has led to criticism, as it ultimately blurs the lines between social and security policies.<sup>34</sup> Moreover, the accuracy of preventative measures increases when their goal becomes more precisely defined.<sup>35</sup> Therefore, it is necessary and beneficial to clearly differentiate between believing in a cause and taking actions that support such a cause. Finally, it is important to indicate whether or not those beliefs and actions legitimize or include violence.

Taken together, this leads to a differentiation of cognitive radicalization, behavioral radicalization, cognitive extremism, and behavioral extremism. Although it is possible for all of these to occur in one individual, several cases show that exhibiting any one or a combination of some of these might also be possible.<sup>36</sup> For instance, an individual could be cognitively extremist but only display behavioral radicalization and not behavioral extremism (e.g., only engaging in peaceful protests). Conversely, one could hold radical attitudes and show behavioral radicalization by joining a terrorist group yet be unwilling to engage in violence themselves. However, the terrorist group might push people into a role they did not want to take on, and they might become involved in behavioral extremism against their own wishes and beliefs (e.g., due to group pressure). Therefore, it is imperative to discern those who are cognitively radicalized from those who are making decisions to take violent extremist actions, since different measures of detection and countering should be applied to these different forms of radicalization and extremism.<sup>37</sup>

### Theoretical models of cognitive and behavioral radicalization

One of the earliest scholars to emphasize the importance of distinguishing between radical beliefs and radical actions was Borum.<sup>38</sup> In two comprehensive articles, he cautions that focusing prevention efforts on radicalization might conflate the concepts of radicalism and terrorism. Specifically, there are multiple pathways into terrorism involvement, and adopting extremist views is only one possible pathway. Other authors have for example noted the existence of a transitional pathway of one type of violence into terrorist violence, which was coined the politicization of violence.<sup>39</sup> Moreover, Borum contends that terrorism is multi-determined, meaning it is driven and sustained by a variety of causes, which often differ across people and time points.<sup>40</sup> Furthermore, terrorism adheres to the principle of equifinality, as different pathways can lead different people towards radicalization and engagement in terrorism. Shared pathways also can be multifinal, however. Even though multiple individuals might be on a similar trajectory, with shared experiences and risk factors, they can have different outcomes. These notions implicate that the radicalization pathway and action pathway are not necessarily intertwined, and therefore that using the radicalization pathway to estimate someone's position on the action pathway would render imprecise measurements.

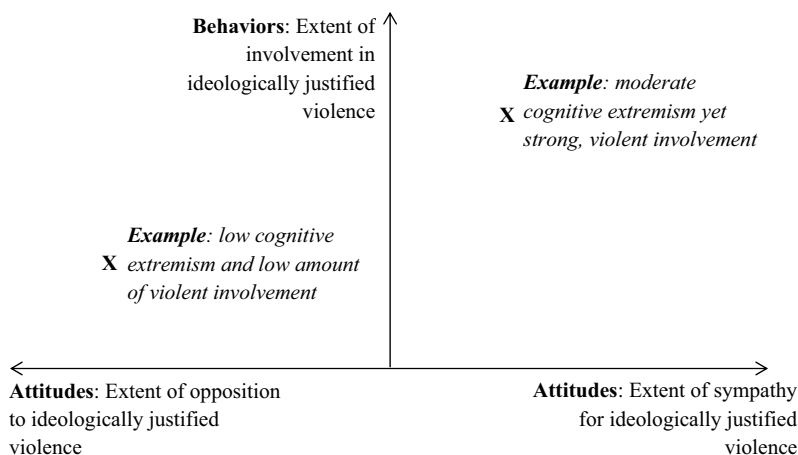
Building on the insight that radical attitudes and radical actions need not be intrinsically connected, McCauley and Moskaleiko expanded their pyramids model to consist of two separate pyramids.<sup>41</sup> These are an opinion pyramid and an action pyramid, and similarly to the original model, they both have a large number of supporters at the base and a few with extremist ideas or actions at the apex. In doing so, it is effectively accentuated that there are much more people who carry a sympathy for a cause or ideology than those who feel an obligation or take up violence in support of this cause. Additionally, the authors stress the independence of these pyramids, as one's level or movement in one pyramid does not affect their position in the other pyramid. Moreover, it is possible to skip levels in the pyramid while moving up or down, and both pyramids are likely driven by different factors. Although the reception of the model has been largely favorable due to its strong visual image, the two-pyramids model has been criticized for not specifying pathways between the different levels of the pyramids.<sup>42</sup> The model also adheres to categorizing individuals within specific groups, while not clearly specifying the boundaries or meanings of these categories.<sup>43</sup> In addition, even though it explicitly separates behaviors and actions, the model does seem to conflate radicalism and extremism, portraying cognitive and behavioral extremism as an extension or escalation of cognitive and behavioral radicalism. Moreover, it remains somewhat unclear what might be driving the action pyramid, if it is not

driven by the opinion pyramid. A recently proposed framework has addressed these concerns on trajectories and drivers of cognitive and behavioral radicalization and will be discussed below.

### **Attitudes-behaviors corrective model**

Recently, Khalil and colleagues have contributed to the field's conceptual understanding of cognitive and behavioral radicalization and extremism by introducing the Attitudes-Behaviors Corrective (ABC) Model.<sup>44</sup> The distinction between those who are sympathetic to ideologically justified violence and those who are involved in its creation is placed at the heart of this model. The dimensions of attitudinal and behavioral extremism are seen on a continuum rather than consisting of ordinal stages, as in other models. This is depicted visually by placing each on an axis of a Cartesian upper half-plane, with attitudes on the horizontal axis and behaviors on the vertical axis, as can be seen in Figure 1. The attitudes axis is described as running from an opposition to ideologically justified violence towards a sympathy to such violence, while the behavioral axis shows the extent of involvement in ideologically justified violence. Actions on the behavioral axis could span non-violent behaviors that support violence undertaken by others, such as financially supporting a terrorist organization, but can also entail partaking in violence oneself. With regards to the current article's terminology, this means that the behavioral axis encompasses both behavioral radicalization and behavioral extremism, while for the attitude axis it is not completely clear whether the model incorporates cognitive radicalization. That is, the model does not specify whether individuals on its left side, described as "opposed to ideologically justified violence," would still hold radical beliefs and only reject the use of violence, or whether they would completely object radical beliefs as well. As Khalil and colleagues acknowledge, this nuance between cognitive radicalization and cognitive extremism is not accommodated for in their model.<sup>45</sup> A simple solution might be to construct two separate models, one for cognitive and behavioral radicalization and one for cognitive and behavioral extremism.

Despite this limitation, the ABC model allows for a practical and dynamic visual representation of an individual's attitudes and behaviors in support of extremism.<sup>46</sup> It can accommodate determining and comparing the positions of different individuals in an extremist group. It is likely that the leader of a group is positioned highest on both the attitudinal and behavioral axis, while a financial contributor might be very supportive of a group's violence yet take minimal action themselves due to family



**Figure 1.** ABC model of extremism by Khalil and colleagues.<sup>47</sup> The horizontal axis represents extremist attitudes and runs from an opposition to ideologically justified violence to strong sympathy for ideologically justified violence. The vertical axis represents the extent of involvement in ideologically justified violence. Individuals can fall on the bottom end of the axis if they are not involved in violence, in the middle of the axis when they only contribute to violence indirectly, for example financially, or they can fall at the top of the axis, when they directly commit violence themselves. We have placed two example points to illustrate how these two individuals would be positioned on the graph.

obligations. Someone who is being prepared to commit an attack would be positioned high on the behavioral axis but might have stopped believing in the righteousness of these actions and thus be placed to the left on the attitude axis. Thereby, the model provides an effective visual representation of the delineated cognitive and behavioral aspects of extremism. Moreover, and perhaps even more innovative, the ABC model allows practitioners to easily compare repeated assessments of an individual's position on the axes over time, essentially tracking someone's trajectory into and out of cognitive extremism and their involvement with violence. In doing so, the model recognizes that being involved in terroristic violence could occur in a number of different ways, for example in a more traditional bottom-up fashion, with a person first starting to believe violence is justified and then becoming involved in its creation, but also top-down, where someone becomes involved in committing terroristic violence and only then—as a way of justifying or explaining their acts—starts believing in the ideology. Thus, the model offers theoretical and practical support for focusing prevention efforts on behavioral extremism.

Experience with such an approach has already been found helpful in interviewing offenders convicted for terrorism offences, as a study by De Pelecijn found that the visual aid helped the offenders to separate the pathways of their cognitive and behavioral extremism and to discuss their trajectories in more depth.<sup>48</sup> Furthermore, this study has provided support that the trajectories of cognitive and behavioral extremism of the offenders did not necessarily co-evolve. Rather, the intensity of the offenders' beliefs and actions evolved independently, and their actions were driven more by group processes, opportunities, and rewards, than by the strength of their extremist attitudes at that point in time. This empirical evidence confirms that the ABC model provides a practical and helpful aid in positioning and diachronically tracking individuals with respect to their extremist attitudes and actions and that it closely captures reality.

### ***Different drivers for different forms of extremism***

In addition to introducing their visual model, Khalil and colleagues introduced three types of drivers of extremism that align with the attitudes-behaviors disconnect.<sup>49</sup> The first type is called structural motivators and includes more general factors such as state repression, poverty, and discrimination. The second type of driver relates to individual incentives such as material incentives, vengeance, and high status. The third type consists of enablers, including social networks and online communities, radical role models, and access to weapons. As Khalil argued in an earlier article, the structural motivators are mostly collective drivers and can influence the formation of one's attitudes and values.<sup>50</sup> Therefore, these are adept at explaining why individuals in a societal group might be more receptive towards extremist interpretations of their grievances. However, such collective drivers are unable to account for an individual's decision to take up violence in support for a cause. In contrast, it is theorized that the process of becoming behaviorally involved in the creation of ideologically justified violence requires the presence of individual incentives. These could be an impactful personal experience of discrimination, a personal reason for seeking vengeance, or promised rewards.

Cognitive extremism thus can develop through a more generally experienced sense of state repression, while behavioral extremism is more likely driven by impactful personal experiences of such repression. The model further postulates that cognitive extremism can be encouraged through enablers such as charismatic leaders or virtual communities advocating for extremist views. For behavioral extremism however, more general enablers such as recruiters or role models can be facilitating to some extent, but access to weapons or to co-conspirators might be more important. By identifying distinct motivators and enablers for the pathways towards extremist attitudes and behaviors, the model makes it conceivable that someone partaking in extremist violence might not be driven by elaborate ideological ideas, but that a few strong individual motivators, such as vengeance and status, are sufficient for taking the decision to act.

In addition to the separate collective and personal processes, Khalil contends that these processes might interact in that cognitive extremism within a community might indirectly drive behavioral

extremism, even in individuals with few or no extremist ideas.<sup>51</sup> That is, if a social group supports the use of violence for a cause, they enlarge social or material rewards for committing such violence, inflating the potential individual motivators. In that sense, someone who is positioned low on the attitudinal axis might be more easily motivated to commit terrorist violence through these large individual motivators compared to if the potential rewards were perceived as low. Thus, the ABC model offers a theoretical rationalization for why some individuals within a community would decide to take violent action and others do not, but it can also explain why some radical groups have no members who transgress to violent action, while others have many.

## Prevention approaches of terrorism

### *Preventing terrorism through countering radicalization*

Despite a variety of scholars and theories advocating for disaggregating cognition and action in prevention strategies, current prevention methods for terrorism are largely focused on countering the cognitive aspects of radicalization and extremism. These programs exhibit the implied hope that countering cognitions and beliefs will indirectly result in a lower number of individuals willing to commit terrorist attacks, since they rely on the assumption that without intervention, cognitive radicalization leads to violence. An example of such a strategy is the “Prevent” program employed in the United Kingdom. Prevent is part of the larger counter-terrorism strategy of the UK called CONTEST, consisting in addition of Pursue, Protect, and Prepare.<sup>52</sup> It has been noted that within this multileveled approach, Prevent has disproportionately been the primary focus.<sup>53</sup> Prevent is specifically aimed at preventing early-stage ideologies and radicalized opinions from becoming ingrained.<sup>54</sup> For this, it stimulates public institutions, such as schools or sports clubs, to report individuals to Prevent who would be displaying early signs of radicalization. The burden of countering radical narratives is thus placed on vulnerable communities themselves.<sup>55</sup> Since 2015, the Counter-Terrorism and Security Act even places a legal obligation to report individuals who are suspected to be on a pathway to radicalization.<sup>56</sup> Signs of radicalization, or radicalization itself, are not well-defined or demarcated within Prevent, but these are understood to be mainly indicators of adopting an “extremist ideology.” This ideology does not necessarily need to be violent or concerning, yet it is assumed to somehow undermine so-called “British values,”<sup>57</sup> thereby politicizing and securitizing identities and values.<sup>58</sup> When reported to Prevent, these individuals are requested to attend early intervention programs with the goal to deradicalize them and to move them away from the social network that supposedly pushes them to these ideas.

This method of making members of public institutions, such as teachers or community workers, responsible to spot and report radicalization while not clearly defining what indicators of radicalization to pay attention to, introduces a constant of possible surveillance for those who may hold more moderate positions as well.<sup>59</sup> It has indeed been reported that surveillance and record-keeping of students in British schools has become mundane.<sup>60</sup> Hence, Prevent might further ostracize groups in society, which ironically may lead to radicalization<sup>61</sup> and thus may do more harm than good.

Besides being ethically problematic, attempting to detect radicalization in an early stage with the goal to counter it is a simplified understanding of radicalization and unlikely to be effective.<sup>62</sup> Indeed, figures on the referrals to the Channel program show that only 5 percent of referrals in 2016 and 2017 needed Channel intervention.<sup>63</sup> The reasons for this inefficiency tie in with points that were described above. First, radicalization is a difficult concept to define, and conceptualizations differ considerably between and within the academic community, policy makers, and the public, complicating its operationalization for prevention efforts. This has been found to lead to subjectiveness and arbitrariness.<sup>64</sup> Second, adopting radical ideas is widely prevalent, with many more individuals adhering to a radical ideology than that are willing to commit violence for this ideology. Third, radicalization is not necessarily indicative for the commission of violence, as some who are willing to commit terrorist

violence are not cognitively radicalized. Therefore, by focusing on radicalization, approaches to identify and counter terrorist acts are directed at a much too large target group, which will consequently be ostracized, while these approaches will miss a substantial number of people who are motivated to commit violent terrorist acts for reasons other than cognitive radicalization.<sup>65</sup>

### ***Behavioral warning signals as an alternative approach***

Rather than focusing on detecting signals of cognitive radicalization or extremism, it might be possible to identify signs that are more exclusively related to the planning of a violent attack. In most cases, violent terrorist acts are meticulously planned over a substantial period of time, requiring a supportive network of financing, organizing, and acquiring or manufacturing weapons. This time period provides a unique opportunity for the threat assessment of terrorist attacks to detect warning signals and use these to intercept plans before they can be realized.<sup>66</sup> Moreover, due to the lengthy preparation periods, it is likely that a person involved in the organization of a terrorist attack would, either wittingly or unwittingly, alert an uninvolved individual of their plot.<sup>67</sup>

Utilizing these signals for prevention seems to carry some inherent advantages. First, attempting to detect attack planning is a more specific, demarcated risk specification than detecting those who are radicalized. That is, attack planning behaviors will be mainly observed in those who are actually planning an attack. As has been noted before, a more specified risk outcome will benefit the accuracy of prevention efforts.<sup>68</sup> Second, behaviors that signal attack planning are an almost necessary condition for committing an attack, with the rare exception of spontaneous attacks using easily accessible weapons. Therefore, attack planning behaviors will be observable prior to terrorist acts more often than signals of radicalization or extremism.<sup>69</sup> Importantly, behavioral warning signals will also be present in those cases in which an individual who is not (as) cognitively radicalized goes on to commit an attack.<sup>70</sup> Third, attack planning behaviors can be more directly observed than indicators of certain attitudes and beliefs.<sup>71</sup> These are difficult to observe and evaluate in a pre-crime threat assessment context due to the distanced observation and assessment of a person of interest. In this, threat assessment differs from a risk assessment context, which focuses on recidivism and where assessments are usually conducted by a counsellor or probation officer who can discuss aspects of cognitive radicalization and extremism with a person of interest. The ABC Model offers a convenient and practical example of how extremist acts can be tracked dynamically, independent from potential cognitive extremist factors.<sup>72</sup> Therefore, behavioral warning signs have been proposed as more observable, objective and practical indicators that can be used in pre-crime, threat assessment contexts.

Notwithstanding these inherent advantages of behavioral warning signals in a threat assessment context, detection of terrorist attacks will remain difficult. As terrorist violence is only one of the forms that behavioral extremism can take, not all behavioral extremist actions will be a sign of attack planning, and thus careful research needs to identify behaviors that can be used as such. Therefore, conducting research on attack planning behaviors and developing a targeted approach for using these observations in prevention methods is needed. In conclusion, attack planning behaviors could constitute a warning sign that someone or a group might be planning a violent terrorist act, that is both specific to the commission of violence and relatively practical to observe.

Empirical studies have provided evidence that behaviors and actions can tell us which individuals or groups are planning an attack. Some studies have attempted to more generally differentiate empirically between those who did and those who did not engage in (preparatory) acts of violence, and have found that amongst a variety of factors, behavioral indicators were good predictors of actual (planned) violence.<sup>73</sup> Other studies have taken a more focused approach and have specifically looked for differences in behavioral warning signals in those guilty and innocent of (planning) an act of terrorist violence.<sup>74</sup> This article will attempt to provide an overview of both these types of studies.

### *Studies with a general approach*

The number of empirical studies examining factors associated with conducting a terrorist attack has increased in recent years.<sup>75</sup> Although most of these solely include sociodemographic or cognitive risk factors,<sup>76</sup> some studies have also included behavioral factors, such as seeking training or sharing extremist beliefs publicly. The first studies signaling that behavioral indicators were promising for prevention approaches, were case studies of executed or foiled terrorist attacks, such as the study by Clutterbuck and Warnes.<sup>77</sup> Their study researched the planning and preparation periods of six planned attacks between 2004 and 2007 in the United Kingdom. They found that some behavioral indicators, such as seeking training or acquiring weapons, could be observed for all of these plots and for all involved individuals, while indicators relating to cognitive radicalization and extremism were present in only half of the involved individuals at most.<sup>78</sup> Building on these findings, comparative studies seeking to differentiate between those who did and did not engage in (preparatory) acts of terrorist violence increasingly included behavioral factors as well. The following overview will focus on such comparative studies, as these have generated findings that are relevant to the prevention of terrorist acts.

One of the earliest studies to examine behavioral variables amongst behavioral radicals and extremists, was a project conducted by Jensen and colleagues using data from the “Profiles of Individual Radicalization in the United States” (PIRUS) database.<sup>79</sup> They found that criminal activity prior to the radicalization period showed a strong association with a violent outcome. However, additional behavioral variables were not considered in this study. The importance of previous violent crime was confirmed in a study by Ivaskevics and Haller.<sup>80</sup> They compared 1240 individuals who participated in violent behavioral extremism to 908 individuals who only participated in behavioral radicalism from the PIRUS database using machine learning methods. A history of violent crime was one of the twenty-five predictors significant for a violent outcome. Another behavioral variable, seeking training, was the third largest predictor of committing violence in their study, with only radicalization during prison and an anti-gay ideology being more predictive.<sup>81</sup> The significance of following training for the prediction of violence has been demonstrated in a number of additional studies. Knight and colleagues examined differences between 16 extremists who had not committed terrorist violence and 24 extremists who had been involved in such violence.<sup>82</sup> They conducted extensive case studies of these individuals with open-source information. Both groups were mostly similar on factors that are commonly relied upon to predict the commission of violence, such as grievances, psychological factors, and a search for identity.<sup>83</sup> However, the groups exhibited differences on almost all behavioral factors. This included participation in training related to terrorist activities, traveling abroad for events related to extremism, and—curiously—a passionate participation in team sports.

Similarly, a study amongst 131 US Muslim converts by Snook and colleagues supports the usefulness of the variable training for the prediction of violence.<sup>84</sup> Using Dominance Analysis, they determined which of the significant variables were most strongly related to participation in violence. Three dominant predictors emerged, of which seeking training and owning a weapon explained most of the variance. The other dominant predictors were being a domestic terrorist and expressing extremist views publicly.<sup>85</sup> Expressing extremist views could refer to posting these on social media or publicly advocating for jihadist terrorism in their community. This was related to a violent outcome in a study by Horgan and colleagues as well.<sup>86</sup> These authors examined the different roles and their predictors in terrorism groups related to al-Qa’ida. Out of their sample of 183 individuals convicted of terrorism in the United States, 8.74 percent were classified as violent actors and 25.69 percent fulfilled a hybrid role that included the role of violent actor. Their analysis showed that almost all (93.8 percent) of those who solely fulfilled a violent actor role and 46.9 percent with a hybrid role overtly expressed extremist ideology, while only 22.3 percent and 17.3 percent of the facilitators and supporters did. This study also did find some contradicting evidence regarding criminal history, as it could not significantly establish differences in previous conviction rates or types of criminality amongst the groups.<sup>87</sup>

With regards to internet use, two studies have found that those who go on to prepare or execute a terrorist attack seem to be less active online.<sup>88</sup> Kenyon et al. examined online and offline engagement with extremist content and persons in a sample of 235 individuals convicted of extremist offences in England and Wales.<sup>89</sup> They found that those who primarily engaged offline with extremist content and persons were more likely to have committed a violent offence and take on an attacker role than those who portrayed hybrid or primarily online engagement. A similar study looked at the use of the internet in a passive versus an active way in a sample of 109 violent terrorist offenders and 268 non-violent terrorist offenders.<sup>90</sup> They found that those who actively generated and disseminated extremist content and/or interacted with fellow extremists online were less likely to have planned or executed a terrorist attack than those who only used the internet passively. In contrast, violent terrorist offenders were most likely to have used the internet to learn about targets or attack methods.<sup>91</sup>

In summary, the body of literature on behavioral indicators signaling the possible planning of an attack has suggested some factors that converge across multiple studies. These supporting findings come from studies with vastly different methods, sample sizes, and inclusion criteria, suggesting that these results might hold true on a population level. The evidence for the relevance of previous criminal history is rather mixed for now,<sup>92</sup> although support for its importance arises from research into the crime-terror nexus.<sup>93</sup> Studies on the internet use of terrorist offenders indicate that violent terrorist offenders are more likely to engage with extremist content and individuals offline, and that when they use the internet, this is mostly to learn tactical information that can help them in preparing their attack.<sup>94</sup> In addition, seeking training in extremism related activities and publicly expressing extremist views demonstrate strong relations to participation in violence across multiple studies.<sup>95</sup> These findings illustrate the importance of including observable, behavioral signals in empirical studies attempting to differentiate between violent and non-violent terrorist offenders.

However, some limitations in the body of research remain as well. Many identified studies could not be included in our overview as they were restrained by methodological limitations. For example, several studies demonstrated an absence of a comparison group, or an unsuitability of the comparison group, such as comparing terrorist attackers with a general group of Muslims. Instead, comparison groups should be more similar to the group of interest, such as innocent suspects of planning a terrorist attack, behavioral radicals, or cognitive extremists. Furthermore, behavioral variables are often neglected in empirical studies comparing a group of terrorist attackers and non-attackers. As a systematic review by Desmarais and colleagues observed, most studies focus on the association of individual factors with terrorism outcomes, while these appear to be of limited predictive value.<sup>96</sup> This demonstrates, as has been advocated by many others,<sup>97</sup> that behavioral indicators can be of great value in the prediction of which individuals might be involved in the (planning) of violent terrorist acts.

### ***Studies focused on behavioral indicators***

In addition to studies with a more general approach, some studies have focused more specifically on behavioral warning signals of the planning and preparation of a terrorist attack. Most of these studies utilize the term *leaking* to broadly refer to warning signs, which include expressions or behaviors by which potential offenders consciously or unconsciously publicly reveal fantasies, thoughts, ideas, intents or plans of an offense prior to its perpetration.<sup>98</sup> A related, albeit slightly different term, is *leakage*, which refers more narrowly to the announcement or threat of an attack.<sup>99</sup> Leaking can be an important aid in detecting those who are planning terrorist violence, as its prevalence is high amongst those planning an attack while it is less common in the general public than currently used indicators, such as radicalization signals.<sup>100</sup>

In exploring the potential of leaking signals in detecting plans of terrorist attacks, Dudenhofer and colleagues conducted a review of early studies on leaking behavior in violent terrorist offenders.<sup>101</sup> They confirmed that most offenders showed leaking, with some studies finding that up to 90 percent of offenders in their sample had showed leaking signals months or even years prior to an attack. Most of these leakings occurred verbally and were directed to friends and family, next to written and alternative forms of leaking.<sup>102</sup> Unfortunately, most of the included studies only considered offenders who

planned or executed a terrorist attack, without comparing these to a control group. Moreover, most studies solely focused on lone-actors, assuming that lone-actors are more likely to leak their plans. However, these limitations have been overcome in studies that examined threat assessment instruments based on leaking signals.<sup>103</sup>

Building on the emerging confirmation that leaking behaviors can be helpful in detecting and preventing terrorist attacks, two threat assessment instruments have been developed that explicitly consider leaking signals. These instruments are designed for use in a pre-crime context, such as the threat assessment of potential attackers by intelligence services. The earliest instrument was developed based on open-source data in the United States and uses eighteen indicators to identify lone-actor terrorists. It is called the Terrorist Radicalization Assessment Protocol (TRAP-18).<sup>104</sup> It is used primarily in North America by professionals involved in threat assessment, but also by threat assessors in Australia and Europe.<sup>105</sup> TRAP-18 consists of eight proximal and ten distal warning behaviors that have been found relevant in the prevention of targeted violence at large as well as in terrorist attackers. The proximal indicators are comparable to leaking signals and include signs of attack preparation, identification with previous attackers, and directly communicated threats. The distal characteristics are more similar to sociodemographic and individual factors, such as being single, experiencing occupational setbacks, and having a personal grievance.<sup>106</sup>

The TRAP-18 has inspired a large amount of empirical research into its validation, which mainly confirms its value in identifying those who are planning an attack according to a recent systematic review.<sup>107</sup> A study by Böckler and colleagues investigated the predictive validity of the instrument and found that the TRAP-18 overall score demonstrates a promising Area Under the Curve of .88, with a sensitivity of .65 and a specificity of .95.<sup>108</sup> Interestingly, a number of studies emerge that indicate the proximal characteristics are most capable of identifying prospective attackers, while the distal characteristics do not advance or even diminish its potential of differentiating between attackers and non-attackers.<sup>109</sup> For example, in the study by Böckler and colleagues, the Area Under the Curve increased to .90 if the distal items were excluded and the proximal items were weighted, with the sensitivity increasing to .80 and the specificity to .93.<sup>110</sup> These results underscore that leaking signals can be useful in identifying potential attackers, and that they might be even more helpful than commonly relied on factors.

The TRAP-18 is restricted to the identification of lone-actors, however, and is not aimed at identifying potential attackers that are part of a larger group. A more recent threat assessment instrument based on leaking signals can be used for detecting both group and lone actors, albeit it is focused on Islamist terrorists. This instrument is called “Leaking als Warnsignal für islamistisch motivierte Terroranschläge” (LATERAN-IT) and it is currently being examined for implementation in German police services.<sup>111</sup> It was developed in Germany based on a comparison of prosecution case files of 52 individuals who had been suspected of planning an attack and who showed leaking signals but were found to be innocent, and 48 individuals who had indeed been involved with the planning or perpetration of a terrorist attack.<sup>112</sup> An initial analysis found that 96 percent of the perpetrators had shown leaking signals, and the average amount of leaking signals per perpetrator was 11.96, compared to an average of 3.04 leaking signals in the control group. Moreover, the leaking signals occurred on average 12 months before the planned attack. Next to leaking signals, the study also recorded more general warning signs that are similar to currently used risk factors, such as an interest in Islam. Compared to almost all offenders displaying leaking signs, only 65 percent of terrorist attacks had shown an interest in Islamist or Salafist ideology, and 56 percent had shown extreme religious attitudes. These data attest that leaking signals are often present even when the extent of radicalization is unclear. Based on their findings on leaking signals in both groups, Tampe and Bondü were able to select 16 criteria that significantly differentiated between the groups and could be practically used in a threat assessment instrument. These indicators form the threat assessment instrument LATERAN-IT.<sup>113</sup>

Statistical analyses indicated that two criteria of the tool should be weighted twice and one criterion thrice, leading to a total score of 20. When applying the instrument to their sample, the terrorist

attackers had a mean total score of 9.69 and the comparison cases displayed an average of 2.25. The predictive validity of this new tool is promising, with an Area under the Curve of .91, a sensitivity of .85 and a specificity of .90 for a cut-off at high risk.<sup>114</sup> A recent validation study with a new sample of cases that were not used for the development of the instrument confirmed these results.<sup>115</sup> These findings affirm that when leaking signals are employed in scientifically validated ways, they can be predictive of which suspected individuals are planning an attack beyond currently relied upon risk factors.

These empirical studies on leaking, the TRAP-18, and LATERAN-IT demonstrate that leaking signals are helpful in detecting those who are planning a terrorist attack. Both the body of literature on the TRAP-18 and on LATERAN-IT find that behavioral leaking signals can identify behavioral extremists more accurately than more commonly relied upon factors such as the radicalization process, and studies on the TRAP-18 even find that including these factors might be more harmful than beneficial to the instrument's overall assessment. If confirmed in further research, this constitutes promising evidence that shifting focus towards behavioral indicators of attack planning would be advantageous to prevention efforts of terrorist violence. The research on the proximal factors of TRAP-18 for lone-actors and on the novel instrument LATERAN-IT for Islamist terrorism shows encouraging results and needs to continue examining whether and how these can be integrated in preventing terrorist attacks.

## Conclusions

In the current paper, we have proposed to demarcate the risk specification for prevention strategies of terrorism by distinguishing between cognitive radicalization, cognitive extremism, behavioral radicalization, and behavioral extremism. It has been argued that prevention approaches of terrorist attacks ought to be focused specifically on behavioral warning signals. Adopting such a specific risk outcome benefits the accuracy of prevention efforts and the efficient allocation of intervention resources. A model that can aid in the understanding and application of this novel risk specification is the Attitudes-Behaviors Corrective (ABC) model. This model regards cognitive and behavioral extremism on continua, accentuating their independence and dynamic nature. Moreover, this model describes how cognitive extremism can be driven by more general, structural drivers, whereas behavioral extremism necessitates individual, personal drivers. These collective and individual drivers can interact and impact one another, potentially even leading to the commission of terrorist acts by individuals who are not strongly cognitively radicalized.

Despite these conceptual and theoretical arguments for distinguishing between the cognitive and behavioral aspects of radicalization and extremism, security efforts remain focused on all these aspects in their prevention of terrorist attacks. They conflate attitudes and actions and hope to combat behavioral extremism by countering cognitive radicalization. As an alternative to these approaches, we proposed that behavioral warning signs can be exploited for the detection and interception of terrorist attacks that are being planned. Empirical studies have shown that these warning signs can indeed identify attack planners, and two threat detection tools have been developed based on the use of leaking signals. The current paper has evaluated these two instruments, the TRAP-18 and LATERAN-IT, and has reviewed validation studies that show these instruments have a promising capacity to detect terrorist attack planners with high accuracy.

With these conclusions, the current paper offers significant implications to current policies and practices on the prevention of terrorist attacks. As we have argued that those who are cognitively extremist are a distinct, and partly non-overlapping, group from those who participate in terrorist violence, it follows that approaches to counter these issues need to be distinct as well.<sup>116</sup> Current prevention strategies for terrorist attacks commonly draw on methods from the risk assessment of terrorism, which depend on indicators of cognitive radicalization and extremism. However, these cognitive aspects are often difficult to observe or evaluate in a threat assessment context. Further research examining how these aspects are nonetheless included and relied upon in threat

assessment is needed. In addition, it follows from the distinction between cognition and behavior that mitigating extremist attitudes should not be coordinated from a security perspective, as this leads to further ostracization of these groups and opinions, but from an integration and anti-polarization approach. Strategies and countries that use such a segregated approach can be identified and investigated in further research. In addition to accentuating this need for separate approaches, the distinction between cognitive and behavioral extremism allows security efforts to focus more specifically on detection of attack preparation. Our review shows that attack planning behaviors can be used to detect terrorist plots with relatively high accuracy. Prevention efforts of terrorist attacks should consider implementing a threat assessment tool to evaluate these warning signs in a systematic, evidence-based manner.

However, limitations of generalizing empirical research to individuals who were not included in the dataset should be kept in mind. Since terrorist attackers remain a relatively small group, the number of potential subjects for empirical studies on terrorism is rather low as well, complicating the application of these research findings to novel cases and suspects. Furthermore, security efforts need to remain vigilant not to overgeneralize surveillance to anyone making vague terrorist threats, as this would lead to the unfounded surveillance of many innocent civilians. In addition, research should reflect on how the available information on a case and the time point at which an instrument is applied impacts its apparent effectiveness. Besides these general limitations, a few specific limitations of this paper need to be considered. First, the review adopted a more traditional literature review method, as a more systematic approach was beyond the scope of the current paper. However, this method has a few inherent weaknesses, as it for example introduces a possibility of biased selection in the inclusion of articles. Notwithstanding, we have attempted to apply methodological rigor and include a large and varied body of work in this review. In doing so, we hope to offer a broader perspective connecting different topics and research subjects than a systematic review could offer.

Second, the current review is inherently limited by the available literature and empirical studies. As mentioned, behavioral indicators are often neglected in research on risk factors for terrorism, and more research should be conducted on the validation of the reviewed TRAP-18 and LATERAN-IT instruments. Research needs to specifically focus on measuring the predictive validity of these instruments with case files from the envisioned end-users, such as police and prosecution services, and in different countries than their development. In addition, comparative studies including different instruments need to be conducted as these will offer invaluable insight into the strengths and vulnerabilities of each instrument. Therefore, the current conclusions on the use of behavioral indicators need to be confirmed in further research.

A third and final limitation is that the literature on the concepts of radicalization and extremism is scattered and uses a variety of terms. This diversity in terminology restricts the comparison and integration of different theories, the search for relevant literature, and the empirical testing of theoretical frameworks. We hope that in proposing the terms cognitive and behavioral radicalization and extremism, more consistent use of terminology will be possible. We believe that these terms offer conceptual clarity and capture reality effectively, providing benefits for both theoretical and empirical approaches to researching the prevention of terrorist attacks.

Notwithstanding these limitations, the current paper offers both conceptual and empirical arguments for utilizing behavioral indicators in the detection of plans for terrorist attacks. While current prevention efforts often conflate attitudes and actions and hope to reduce terrorist attacks by countering both, behavioral warning signs would offer a number of intuitive advantages. They are more specific to the planning of terrorist acts, they are more easily observable, and they are more common among attack planners. Therefore, exploiting these behavioral warning signs would allow prevention efforts to evade measuring more complex cognitive factors and to solely focus on the identification of plans and preparations for violent terrorist acts. Empirical studies confirm that behavioral factors are able to distinguish terrorist attackers from non-violent extremist offenders. In addition, a few threat assessment instruments based on behavioral indicators have been developed and both TRAP-18 and LATERAN-IT show a promising capacity to detect those who are planning terrorist violence. We

advocate for a continuation of the validation and application of these instruments in the prevention of terrorist attacks.

## Disclosure statement

No potential conflict of interest was reported by the author(s).

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