The Journal of Forensic Psychiatry & Psychology

ISSN: 1478-9949 (Print) 1478-9957 (Online) Journal homepage: www.tandfonline.com/journals/rjfp20

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To cite this article: Zainab Al-Attar (2020) Autism spectrum disorders and terrorism: how different features of autism can contextualise vulnerability and resilience, The Journal of Forensic Psychiatry & Psychology, 31:6, 926-949, DOI: 10.1080/14789949.2020.1812695

To link to this article: https://doi.org/10.1080/14789949.2020.1812695

Published online: 12 Oct 2020.

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ILT000177_0001

THE JOURNAL OF FORENSIC PSYCHIATRY & PSYCHOLOGY
2020, VOL. 31, NO. 6, 926–949
https://doi.org/10.1080/14789949.2020.1812695

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Autism spectrum disorders and terrorism: how different features of autism can contextualise vulnerability and resilience

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ABSTRACT

There is no empirical evidence to link autism and terrorism, in the general population. However, when terrorist acts are planned or executed by individuals with autism, it is important to develop an understanding of the individual's autistic functioning and how it may contextualise factors that push them towards terrorism and aspects of terrorism that may pull them in, in order to manage and reduce risk. The role of autism in resilience also needs to be considered in order to capitalise on natural and individually meaningful sources of motivation and protection. This paper explores how different features of autism may contextualise risk and resilience and the implications for support and diversion approaches. Caution is encouraged against drawing conclusions of causality and over-simplification of autism-terrorism links, especially in individuals with co-existing mental health problems and psychosocial adversities. The need for highly individualised formulations that take into account the heterogeneity of autism and how it is functionally expressed, as well as the complexity of terrorism, is strongly advocated. Finally, the limitations in the empirical evidence and research in the field of autism and terrorism are highlighted.

ARTICLE HISTORY Received 30 March 2020; Accepted 10 July 2020

KEYWORDS Terrorism; extremism; radicalisation; autism; autism spectrum disorder

Introduction

The prevalence of autism spectrum disorder (ASD) in the general population is estimated to be 1% (Baird et al., 2006; Brugha et al., 2011), whilst some studies have reported higher rates in the criminal population (Hare et al., 1999; Langstrom et al., 2009; Lewis et al., 2015; Scragg & Shah, 1994). Based on either population statistics, and notwithstanding the likelihood of under-diagnosis, it would be expected that a sub-set of any offender cohort, including terrorists, to be on the autistic spectrum. There is limited empirical evidence of the prevalence of ASD across types of terrorism offenders and

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across countries but some of the existent studies of lone actor terrorist sub-populations suggest that the prevalence of ASD is higher than in group actors and is approximately 3.3%, although the authors cautioned against unilateral and causal attributions and noted that other factors may have been present during the period of engagement (Corner et al., 2016; O'Driscoll, 2018). Other co-existent mental illnesses, for example, may contribute to risk (Al-Attar, 2019). Furthermore, when softer proxies of extremism are measured in research, such as sympathies for violent protest and extremism in the general population, extremism is no longer found to link to higher prevalence of ASD (Bhui et al., 2019).

Risk assessment and formulation tools adopted for extremists all include 'mental illness' items, which include ASD (Lloyd & Dean, 2015; Pressman et al., 2018; Pressman & Flockton, 2012). There are no actuarial measures of terrorism risk, due to the absence of large samples to develop population predictors from. Instead, risk assessment frameworks advocate a structured professional judgement approach that uses individual case formulation to take into account how factors, including ASD and mental illness, can contribute to vulnerability and risk (Heide et al., 2019). Thus, both prevalence and risk assessment frameworks relating to terrorism would suggest that there is a need to understand if and how ASD can contextualise vulnerability and risk and, by implication, approaches to its mitigation. It is of course very important to note that ASD is not causal to risk and all efforts should be made to avoid stigmatising ASD, a lifelong neurodevelopmental condition, and to conceptualise its role as 'contextual' rather than causal to both risk and protection. In other words, features of ASD may shape experience, functioning and behaviour that may in some instances exacerbate an individual's vulnerability, as opposed to cause the vulnerability. Inversely, features of ASD may equally contextualise resilience, in this same way.

Work with individuals who are vulnerable to extremism or have committed terrorism (henceforth referred to as 'terrorism' risk or vulnerability, for simplicity) and who have ASD needs to be informed by a nuanced understanding of the many facets of ASD (including high functioning autism) as well as the complex dynamics of radicalisation and pathways to extremist causes/groups and terrorist offending (Al-Attar, 2016a, 2016b, 2018b, 2018c, 2019). One way the nuances of ASD and the complexities of terrorism can be tackled is to examine how each facet of ASD can contribute to the 'push' and 'pull' factors that shape an individual's pathway to terrorist offending (Aho, 1988; Altier et al., 2017; RAN, 2016). These are the individual, social and ecological factors that push the individual towards terrorist causes, groups or ideologies and those features of the terrorist cause, group or ideology that have a pull for the individual. Hence different features of ASD may contextualise different push and pull aspects of an individual's trajectory to terrorism. The aim of the current paper is to provide practitioners with guidance on how to

hypothesise and assess the role each facet of ASD can play in contextualising push and pull factors for terrorism and explore the implications for effective diversion and resilience-building approaches.

In the current paper, seven facets of ASD that may have different functional links with push and pull factors to terrorism will be examined. These seven facets do not map onto discrete diagnostic symptoms or profiles but are a mixture of diagnostic and research-evidenced correlates of ASD, which have been postulated to contextualise risk and protection in offenders with ASD (Al-Attar, 2016a, 2016b, 2018a, 2018b, 2018c, 2019). They are not aetiologically or clinically mutually exclusive aspects of ASD but they are distinguished as they may have distinct implications for understanding vulnerability to extremism. Each facet is a lifelong aspect of an individual's development and integral to the individual's functioning and hence is not itself a target for change but when it comes to contextualise risk, its role in risk needs to be reduced and its role in resilience enhanced.

Facets of autism: their function, role in push and pull factors & implications for resilience and diversion

For each of the seven facets of ASD, its potential functional role or psychological 'function' for the individual will be summarised, before discussing how this facet could come to contextualise push and pull factors in an individual's pathway to engagement with terrorism. Finally, the implications of this facet for building the individual's resilience and diverting them away from the pathway to terrorism will be explored. A case illustration of how the seven facets of ASD may interact to shape an individual's pathway to terrorism can be found in Al-Attar (2018b). In the current paper, examples of how each facet may shape push and pull factors will be presented as part of the discussion henceforth.

Facet 1: circumscribed interests

Function

One diagnostic feature of ASD is intense, narrow, all-absorbing interests that may become psychologically focal and which often provide a rich source of intrinsic reward, intellectual stimulation (Jordan & Caldwell-Harris, 2012), mastery and well-being (Al-Attar, 2018a, 2019), as well as offer relief from anxiety (Rodgers et al., 2012). Restricted interests are typically researched in great detail for long periods by the individual. They may offer a sense of purpose, social identity and topic of conversation, and the autistic individual often finds that they function at their optimal levels of cognitive, motivational, and social functioning and present with a high level of expertise when engaging and conversing in the

topic of their interest. New details and items related to their interest often provide an intense excitement and thrill and pursuit of the interest may feel cognitively obsessive and behaviourally compulsive. Sharing of interests may become the most natural and comfortable vehicle for establishing and maintaining social relationships. Whilst such interests may be a healthy source of well-being and positive feelings, they may equally be key means to alleviate negative feelings and hence may intensify at times of stress, anxiety and change or uncertainty. At times of depression and anger, interests may take on negative (morbid, destructive or angry/revengeful) themes and involve intense negative rumination. This may be due to interests being an outlet and way of processing the world and one's experiences, and hence a natural vehicle for processing and resolving negative affect and distress.

Role in push and pull factors to extremism

Restricted interests may develop in any topic and may naturally be triggered by salient or 'shocking' topics such as terrorism and other high-profile crimes, such as mass shootings, serial killings or political assassinations (Al-Attar, 2018b, 2019, 2020). They may also be triggered by technical topics that appeal to a brain that naturally processes details, facts and theories, such as explosives, hacking, cyber-espionage and conspiracy theories (Al-Attar, 2018b). In each instance, the individual may conduct detailed research around facts, theories or ideologies, images, and groups associated with their interest and may collect interest-related items and paraphernalia. Such research often leads to a snowballing of topics and offshoots of topics relating to the original topic of interest and may eventually take on illegal channels and methods, including extremist forums/ideologies and terrorist groups/methods. The more such interests become all-consuming and obsessional, the more risks the individual may take in pursuing them. The focus during pursuit of the interest is generally on the immediate rewards of the details and the wider and longer-term consequences are often overlooked, due to strong local coherence and impaired central coherence (discussed later in this paper).

Restricted interests typically have a very strong push power in that they are intense, highly rewarding and alleviate negative emotional states and hence their push may be stronger at times of negative mood or boredom. Any detail, image, group or activity related to that interest, in turn, has a strong pull power, as do any social networks and interactions relating to that interest, due to their facilitation of the interest. The interest may be in any 'topic', including terrorist groups, ideologies or methods and all details and associated features of that topic will then come to have a strong pull for the individual. Where such interests are then diverted into terrorist plans, clearly risk will escalate, albeit the function of the behaviour for that individual may

essentially remain primarily focussed on seeking the intrinsic rewards of that interest.

Implications for resilience and diversion

Where terrorism-related restricted interests develop into strong and durable interests, there are at least three strategies that can be deployed to increase resilience (Al-Attar, 2020). Firstly, existent healthy interests (and associated fantasy) that serve similar psychological functions and offer comparable levels of reward/relief as the terrorism-related interests could be nurtured. Secondly, where the individual does not have any offence-unrelated interests that meet similar needs, a harm-reduction approach can be adopted whereby the legal pursuit of safe offshoots of terrorism-related interests could be facilitated, with guidance and support to ensure the individual does not stray into illegal territory. Practitioners need to carry out a thorough and detailed history of the origin and divergence of the terrorism-related interest in order to identify any safe, legal variants and subsidiaries that could be capitalised on. Thirdly, a containment approach could be adopted to develop strategies that the individual and professionals could use to monitor and regulate the pursuit of the terrorism-related interests. The physical or illegal pursuit of the interest could be deterred and fantasies around the interest could be reduced, either through self-management strategies such as distraction and rule-setting or through external support and boundary setting. Both external and internal triggers to the interest could be regulated. Where the interest in terrorism themes is unshakable, at the very least healthy legitimate platforms for the discussion of the interest (e.g., speaking about and researching them with professionals) could be facilitated, in order to safely contain the expression of that interest.

Regardless of the approach adopted, it is important to note that where stress, anxiety and depression may heighten the focus on and compulsion to pursue terrorism-related interests, support and therapy should be provided to assist the individual to restore their well-being and emotional health whilst also managing the triggers to their interests. All the above-mentioned intervention approaches should maintain a focus on managing the 'here-and-now' rewards of the interests, including interests in political or religious ideologies, rather than on addressing long-term political goals or bigger-picture moral objectives even when the ideology espoused makes reference to such goals and objectives. This is because the pull and push effects are driven by the immediate intrinsic rewards of the restricted interests and practitioners should not be distracted by narratives of long-term political objectives that are rote learnt and repeated if these are secondary to the prime motivation of pursuing an immediately rewarding interest.

Facet 2: rich vivid fantasy & impaired social imagination

Function

Restricted interests and pre-occupations may be expressed through vivid, typically visual, fantasy. Some individuals with ASD have strong visual and rote memory alongside impaired social imagination and context blindness (Craig & Baron-Cohen, 1999; Daniels-McGhee & Davis, 1994; Vermeulen, 2012). As a result, their fantasy life is often based directly and literally on images and narrative accounts they have accessed (e.g., online or offline), with little alteration to make the content realistic to their life or its social and political contexts (Al-Attar, 2016a, 2016b, 2018a, 2018b, 2018c, 2019). Furthermore, due to strong local coherence and impaired central coherence (see Happe & Frith, 2006 for a review) and theory of mind (Baron-Cohen, 2000), the fine details of the fantasy may be more captivating than any wider emotional meaning or social context of the fantasy. As a result of the aforementioned neurocognitive styles, detailed visual fantasy based on images or stories (e.g., of terrorism) may become very rewarding and indeed intrusive and compulsive.

Fantasy can serve many functions that render it positively and negatively reinforcing and may hence strengthen over time. Fantasies often offer very rich and potent sources of stimulation and reward, and may also have emotional self-soothing functions. For example, they may provide physiological, intellectual, and emotional reward whilst also alleviating boredom, anxiety, helplessness and anger (Al-Attar, 2018a, 2019). Themes in the fantasy could serve specific functions (e.g., revenge or violent fantasies may address injustice or avenge perpetrators of the injustice, releasing anger or empowering the individual against those who belittle them) or general functions (e.g., provide intellectual stimulation and excitement). The more reinforcing fantasies become, the more likely they are to be repeated and maintained. The individual may need to enhance the fantasy in order to receive the same level of reward and as a result the details may be altered as time goes on.

Fantasy may or may not be acted out. On occasion, internal fantasy may be sufficiently rewarding without necessitating behavioural enactment or else the individual may have adequate behavioural inhibitory controls that deter them from acting out the fantasy, if they deem doing so inappropriate. Nevertheless, some individuals may act out their fantasy, either due to an increased level of compulsion/reward of the fantasy or due to a reduced level of inhibitory control. Alternatively, it may be due to the desire to enhance the fantasy beyond internal mental imagery in order to obtain the desired reward intensity. Fantasy can become exceptionally compelling at times of heightened stress (Palermo & Bogaerts, 2015) and may take on darker or more morbid themes at times of anger and depression (Al-Attar, 2018a, 2018b, 2019).

Role in push and pull factors to extremism

Fantasy can become linked to any type of offending, including terrorism. Fantasies may be based directly on online or TV imagery, narrative accounts from books and the internet and even coverage of terrorist attacks on the news or online. If it comes to serve strong psychological functions, fantasy may become compulsive and repetitive. At times, fantasy-related imagery/websites are accessed repetitively, to feed the fantasy and due to their pull. Where terrorism-related fantasy becomes strongly compulsive, if behavioural inhibitions loosen or the individual is afforded practical opportunity, risk of acting out the fantasy may increase. Terrorism-related fantasy and imagery, if acted out, can heighten risk and determine the type of risk (e.g., modus operandi and targets/victims (Al-Attar, 2019).

Different internal and external triggers can accentuate the push towards certain types of fantasy. For example, negative mood states and a sense of injustice/anger can act as push factors towards fantasies of revenge and restoration of justice (Al-Attar, 2018a, 2018b, 2019, 2020). Depressive states when combined with anger can be a push factor towards fantasies of dying or being killed during acts of heroism, demonstrative self-sacrifice and violent revenge (Al-Attar, 2019). Terrorist material, narratives and imagery can, in turn, have a strong pull at such times if their themes resonate with such emotional states. Imagery of noble acts of revenge and honourable death can gratify anger and alleviate anguish through offering a fantasy of noble death. Heroic warriors or fighters can have strong pull for the disempowered and offer excitement and nostalgia for those who lack healthy stimulation in their life.

Terrorism fantasies and their enactment can both soothe or express negative emotions as well as afford potent positive states such as intense excitement, thrill and intellectual mastery. Boredom and an absence of healthy sources of excitement and mastery can act as push factors to terrorism fantasy when terrorism is portrayed as masterful, sophisticated and clandestine, especially once it becomes the topic of restricted interests which offer inherent reward and stimulation (Al-Attar, 2019). It is often the fine detail of such fantasies that affords intellectual excitement (e.g., technical designs of bombs, technical planning of the operation) and when these are shared online or offline by the individual and affirmed by others, fantasy can become socially/externally reinforced also. As fantasy becomes more compelling and is affirmed by others, it is more likely to be shared with others and it is often this sharing of fantasy that is referred to as 'leakage' in threat assessment research (Schuurman et al., 2018). Such leakage may lead to detection and arrest prior to enactment although leaking fantasy may or may not suggest fully formed intent to enact the fantasy, as fantasy enactment may depend on the push power and loss of inhibitions at that point in time.

Finally, fantasy can be experienced as aversive and involuntary, in some. Where distressing and often graphic imagery of violence (e.g., terrorist groups often use graphic images of suffering victims as part of their propaganda campaigns) imprints strongly in visual memory and replays in an intrusive, recurring way, it can cause distress and push towards revenge propaganda and counter-fantasy. Hence, distressing fantasy (including that based on mainstream news) can act as a push towards extremist imagery, groups and causes that purport to avenge those to blame for the distressing events. Thus, distressing imagery can become intrusive and fuel anger and threat, which then push towards terrorist fantasy that serves to alleviate it. An example could be an individual becoming distressed by images of Islamist extremist acts, which then pushes them to research extreme right wing violence, or indeed vice versa. Thus, the role fantasy can play in shaping pathways to terrorism is complex and individual.

Implications for resilience and diversion

The complexity and heterogeneity of terrorism-related fantasy life and the functions it serves point to the importance of individual assessments that seek to delineate how such fantasy developed and what is maintaining it, in order to inform strategies for its management. Fantasy can afford a healthy source of intellectual stimulation, psychological reward and emotional relief and should not be pathologised. However, where terrorism-related fantasies develop and come to be positively and negatively reinforcing, these can drive risk, especially if the individual contemplates and prepares to enact them. Fantasy, even when it is terrorism-themed, may or may not signal heightened risk of enactment but in some individuals, fantasy may spill into enactment and hence internal and external push factors and pull elements need to be established in order to mitigate enactment. It is important to establish the specific functions that terrorism-related fantasies serve for the individual and assess their addictive and compulsive qualities, as well as their internal and external triggers.

Where fantasy becomes risk-related, the individual should be supported to meet the functions served by the fantasies through alternative, healthy means (e.g., healthy sources of positive states and means to alleviate negative states). Support to manage internal triggers (e.g., depressive mood or angry ruminative thoughts) as well as external triggers (e.g., social stress, access to online imagery) may also minimise the frequency of fantasies. Where terrorism fantasies persist, developing distraction techniques to divert attention away from the fantasies in order to reduce their duration and intensity, whilst offering healthy alternative sources of the rewards afforded by the fantasies, may be helpful. Where possible, healthy fantasies unrelated to terrorism should be encouraged and where none are viable, safe off-shoots of the terrorism-related fantasies should be encouraged, as it is not realistic nor

indeed healthy to attempt to eradicate fantasy life and focus should be on managing its risk. The aforementioned strategies all aim to reduce the push factors to terrorism fantasy and develop healthy alternatives that have similar pull.

Where intense terrorism-related fantasies persist and become compulsive, it may be helpful to reduce their pull power. This may be achieved through conditioning/associating the fantasy with negative states (using non-intrusive, narrative and imagery tasks) or critiquing the authenticity and agenda of the imagery in order to reduce its intellectual appeal. For example, nostalgic/romantic depictions of violence can be challenged by exposing their immorality and deliberate staging, to reduce their appeal. As an autistic individual may have impaired social imagination and take information literally as fact, they may require support to recognise the lack of realism of the fantasy (in general and its lack of realism in the context of their own life). For example, the fictional story depicted in a book or online video is unlikely to be realistic and apply to their real life context. The more the individual can consider the fallacy and lack of applicability of their fantasy, the less intellectually appealing it may become. Nevertheless, the sensory (visual and aesthetic) appeal of the fantasy may remain and of course it is important to reduce access to all external and visual sources of such fantasy (including legal platforms for imagery/materials that trigger the fantasy), in order to reduce the triggering of such fantasies in the first instance.

Facet 3: need for order, rules, rituals, routine and predictability

Function

ASD may heighten an individual's need for predictability, consistency/routine, order, and rigid adherence to rules. Well-being may be enhanced when the individual's life and the world around them is predictable and follows an order, sameness and consistency. Inversely, unpredictability, loss of order and consistency can cause confusion, anxiety and distress. Research has suggested that aggression and offending may in some autistic offenders link to a sense of loss of order and predictability or a reaction to others breaking rules (Al-Attar, 2018a; Gunasekaran, 2012; Murphy, 2013).

Role in push and pull factors to extremism

At times, structure, routine and predictability in an individual's life may break down due to unforeseen events or changes such as loss of employment, accommodation or relationships or due to changes and transitions in one's environment or development/health. This can cause intense anxiety and stress for an individual with ASD and heighten their need for order and predictability in their life, making them susceptible to theories/ideologies/causes that purport to restore the natural (moral, cultural, social or

environmental) order and make the world more certain and predictable or at least to restore what is familiar.

One of the reasons the social world can be daunting for autistic individuals is the unpredictability and inconsistency of people's behaviour. The social world follows very complex, implicit rules which permit people to behave differently depending on their context, time, place and position/power and in reality some people in the individual's personal life may break rules and get away with it. More generally, news and social media coverage is dominated by accounts of how political, popular/celebrity figures and members of society (e.g., criminals) are breaking rules and acting in unpredicted ways that shock us, as unpredictability and inconsistency make events newsworthy. For an autistic individual, a social and political world that is morally chaotic, unpredictable and ever-changing, is disturbing and rule-breaking and moral inconsistencies may trigger strong anxiety and anger. Thus, even ordinary news coverage may heighten anxiety, confusion and anger, especially if it also resonates with personal injustices and experiences of others breaking the rules to one's own detriment. Therefore, even if the individual has routine and certainty in their own life, the disorder and unpredictability in the world around them can make them receptive to extremist ideologies that purport to explain the moral and social disorder and promise to restore order and punish rule-breaking, and by implication promise to make the world more consistent and predictable.

In addition to the push power of an unpredictable world and the pull power of extremist groups/causes that promise to restore order and predictability, there may be additional pull factors associated with terrorist groups/causes that make them intuitively appealing. For example, terrorist groups often brand themselves as organised, systematic, and orderly. They often engage in ceremonial rituals and display neat visions of a social order, whilst stage-managing a depiction of a predictable, safe, organised, structured and highly orderly vision of the world they seek to build. They may adopt absolutist, invariable categories in their ideology and theories of society (e.g., a hierarchy of races or religious groupings that are neatly demarcated and cannot vary or change). Such messaging and branding may appeal to an individual who needs absolutist certainty and strict order, regardless of the philosophical or ideological underpinnings of the cause/group. Any absolutist theory of the world may be comforting and intuitive when the 'real world' makes little sense due to its chaotic, inconsistent and shifting categories of right/wrong and its 'grey areas' of social meaning and behaviour. For autistic individuals with high levels of systemizing and low levels of empathizing (Baron-Cohen, 2002), the world (including the social and political world) makes clearer sense and feels more predictable when it is explained in categories, facts and systems, instead of social and emotional theories (Al-Attar, 2018a, 2018b, 2019). Extremist theories often purport to be factual and

deliberately avoid reference to the social and emotional consequences (e.g., harm) of their vision. All together, they present an absolutist systemising 'single narrative' of the world that is depicted to be based on facts and invariable logic, a world view that may appear more intuitively logical and to offer clarity and predictability to an individual with ASD.

Implications for resilience and diversion

Where vulnerability to terrorism is borne out of a loss of predictability and structure/routine or sense of justice in one's own life, the focus of interventions and support clearly need to be on restoring routine, structure, certainty and fairness/justice in one's life. Support at times of transition (e.g., in school/work/living arrangements/relationships) and assistance to achieve procedural justice at times when the individual is subjected to such injustices as bullying or inequalities of opportunity in life, may also help restore the individual's overall sense of predictability and enhance their ability to cope with life's uncertainties, unknowns and imperfections. Political and social events that cause anxiety for the individual should be explored in safe professional platforms and the hazards of the modern day 'shocking news' culture should be understood. Where possible, the individual should be assisted to find legitimate theories of the world in order to make it feel more predictable and tangible, and the need for categorical and logical order should be respected and met. This could help reduce anxiety that is caused by political and social uncertainties and changes and enable the individual to make a logical sense of the world. Such support approaches aim to reduce the push factors towards terrorist causes/groups that purport to explain and resolve the uncertainties and inconsistencies in life by offering alternative means of instilling a sense of order and predictability.

Also important is reducing the pull power of terrorist groups. It may also be useful to support the individual to critique the claims of the terrorist cause/group and to highlight how it breaks the rules and fails to follow a consistent moral logic towards its out-group or victims as well as its own members. Highlighting the 'hypocrisies' within and moral abuses by terrorist groups and leaders may weaken their powers of persuasion and help facilitate desistance from those groups by planting doubt on their morality (Horgan, 2009), a process that may be even more powerful in individuals with ASD who are intensely unsettled by inconsistency and moral deception. Finally, assisting the individual to critically appraise the inaccurate and misleading propaganda and explanations used by terrorists and to understand how their single narratives are based on a distortion of facts may reduce their pull. Attention can also be directed at how the neat order depicted in terrorist propaganda is staged and may be concealing the chaos and disorder behind the scenes, further diminishing the appeal such propaganda may have.

Facet 4: obsessionality, repetition and collecting

Function

In some individuals with ASD, interests and pre-occupations may take on an obsessional quality, and be pursued repetitively and in pedantic detail (Klin et al., 2007). The need for detail and indeed the aptitude for detail could make the individual minded to always pursue detailed topics, even when getting side-tracked by detail has no pragmatic function and may even be detrimental. The individual may be equally frustrated by errors in detail. For example, if an error is made that impacts them or others they care about, however trivial, it may lead to anxiety, distress and anger at the guilty party and this may become fixated. This of course could mean that individuals with ASD could become very distressed by others' errors and rule-breaking, are naturally interested in detailed topics and prone to collect detailed items/information of interest. They may become pre-occupied and repetitively pursue others who are seen to commit errors or whom become of interest to them.

Role in push and pull factors to extremism

Where an individual has developed a terrorism-related circumscribed interest and preoccupation (or indeed an antecedent pre-occupation with an error or injustice, that is then addressed/avenged by terrorism), this may come to have an obsessional quality that takes the behaviour beyond any pragmatic or indeed operational (terrorist) objective. They may collect large amounts of detail relating to terrorism (i.e. terrorist group/cause or target) and repeatedly watch propaganda, manufacture items, or pursue individuals relating to terrorism. Each instance of access to detailed information, collection of items and pursuit of individuals may constitute unlawful behaviour under Terrorism legislation as well as collectively paint a picture of intense commitment to terrorism. However, each act may not necessarily be linked to a broader or longer-term moral or operational objective. This is not to say that this renders the behaviour less harmful, only that it may be best understood as being driven or at least accentuated by obsessionality, repetition, pedantry for detail and compulsive collecting/pursuit, as opposed to evidence of broader or greater ideological objectives or greater operational involvement.

Compulsiveness and obsessionality may indeed push the individual from transient thinking about/interest in terrorism to a fixated pre-occupation with and behavioural acting out of terrorism interest (propelling from occasional legal, internal thoughts to illegal, persistent external behaviours). In extremism risk terms, this is referred to as 'intent' or 'intention' (Lloyd & Dean, 2015; Pressman & Flockton, 2012) and therefore obsessionality may take the individual from engagement in ideas to an intention to act upon them. The need to repeat may also push the individual to continued pursuit and drive

multiple and repeat offending. Where the pre-occupation is with a terrorist group or modus operandi, the individual may repeatedly communicate with the group or prolifically enact the modus operandi. Where a victim or target is the object of the obsession, they may be pursued repeatedly and in some instances harassed even after arrest.

Finally, terrorist causes may of course also in themselves have a pull power if they afford opportunity and reward very detailed activity. For example, bomb-making and operational terrorist pursuits may be technically highly detailed activities that may be enjoyable and suited to the natural aptitudes of the individual, making them intrinsically appealing. If the individual excels in such pursuits, they may then be socially validated by others and attract co-enthusiasts who share their passion for the detailed, repetitive pursuits and who praise their skill and collections. The individual may of course be exploited for their aptitude and natural desire for detailed and repetitive collecting of information/items. Furthermore, terrorist activity can have a pull if it offers collections of detailed information (e.g., manuals), sets, series (e.g., magazines), and memorabilia. Of course these items may each be illegal and collectively may appear to others to indicate strong commitment to the terrorist cause/group.

The aforementioned facet of ASD may act as a push factor to engaging in detailed and repetitive pursuit of terrorist materials, propaganda and targets. It may in some instances also push the individual from engagement to intent. Terrorist-activity and information may also have a pull due to this feature of ASD.

Implications for resilience and diversion

This aspect of ASD could in some instances make it difficult for the individual to 'let go' of the terrorism-related pre-occupation and/or activity and they may remain intrigued by details and feel compelled to repetitively pursue and collect them. There is no one ideal approach to managing this and support may include a range of approaches such as nurturing healthy, alternative pre-occupations that can be pursued in detail and through repetition and collecting. Ideally the individual should be supported to pursue these tendencies in a productive way (e.g., as part of employment or leisure activities).

Where there are limited healthy alternative channels for this tendency, mental and physical distraction techniques may be developed, and the individual should be supported to self-manage any triggers to terrorism-related obsessional thinking and behaviour (e.g., internal triggers such as heightened anxiety or stress, or external triggers such as information/individuals that act as reminders). Where a victim has been targeted, physical distance and procedural/legal constraints may be necessary. In some instances pharmacological treatments that address anxiety and compulsions may be helpful. It is important not to stigmatise obsessionality and repetition

as it is a feature of ASD for some individuals and does not reflect a harmful trait per se, and therefore the focus needs to be on the management of terrorism-related behaviour and underlining drivers and not on the obsessionality and need for repetition per se.

Facet 5: social interaction and communication difficulties

Function

ASD is associated with, and indeed its diagnosis hinges on, a range of social and communication impairments and features, which will not be detailed herein (see Vicker, 2009 for review) but instead the key areas that could contextualise vulnerabilities and push/pull factors for terrorism will be summarised. These include difficulties that make day-to-day social interactions challenging and stressful, such as difficulty in reading others and appraising their agendas, the tendency to take others and what they say literally (without decoding their implicit and non-verbal cues), the tendency to talk a lot about one's own interests without social awareness, and the tendency to copy and mimic others and rote learn social scripts in order to relate socially and form a social identity and friendships. All these aspects of autistic social communication and interaction have been postulated to constitute potential vulnerabilities for autistic individuals who engage in terrorism (Al-Attar, 2018b, 2019).

Social and communication styles and impairments associated with ASD often make the social world (which adopts and relies on neurotypical styles and strengths in social and emotional processing) daunting, uncertain, and anxiety-provoking. Individuals with high functioning autism often struggle to intuitively decode the unwritten and implicit rules of social life and rely on their strengths in explicit and rote learning to develop social scripts on how to socially communicate and de-code others. Whilst intellectually capable of 'compensating' for their deficits by using their strengths, this often takes a lot of energy due to social interactions being inherently anxiety-provoking due to their lack of reliable, logical and static structures and rules. The individual may encounter novel contexts for which they have no scripts or where their existent scripts are ineffective and may lead to social conflict or embarrassment. Socialising, especially in novel, unstructured situations, can as a result be exhausting, humiliating and anxiety-provoking.

As a result of the above social communication features, autistic individuals may retreat into solitude or at the very least miss out on social, academic and occupational opportunities as a result of the social load and stress these come with. The strain of navigating the complex social world may be too high a cost to pay and the individual may withdraw and become lonely and socially anxious. In such instances, the online world may provide a safe haven where communication can be scripted, rote learnt and done visually and

without subtle social cues (e.g., writing/images that don't rely on non-verbal communication). Virtual space may feel predictable and within the individual's control. Virtual communication can take place in their own time, when they chose to initiate/end. The absence of the social and sensory overload associated with physical social environments can make the online space a rewarding platform through which autistic individuals can feel effective, masterful and skilled. They may be validated by others who are impressed by their communication strengths (e.g., in writing, detailed information recall and rote learning of scripts). In addition to social validation of strengths and alleviation of deficits, the online space can also introduce the individual to social and intellectual kindred spirits and those who share their interests, offering social companionship and belonging.

Role in push and pull factors to extremism

Whilst online activity is not in itself problematic, it may become a vulnerability if the individual accesses extremist websites and establishes online links with terrorists who come to expose them to extremist ideals, exploit their combination of social naivety and/or technical strengths, or inspire them to commit acts of terrorism on behalf of a virtual social group that affirms them. An individual with ASD may not always recognise others' agendas or see 'the bigger picture' and the consequences of what they are being encouraged to do, and take extremist messages and propaganda literally, as facts. Furthermore, when an online extremist community encourages their restricted interests and validates them and their skills, it can become socially and emotionally reinforcing. The individual may experience a sense of social belonging and purpose as well as esteem and mastery, through the online space. Thus social and communication impairments associated with ASD may become push factors to online extremist groups and materials/information whilst online groups that socially validate the individual and offer them ease of communication could have a strong pull. Inversely, social isolation, humiliation and anxiety in the offline space may act as push factors.

Of course the same processes that are described above may act as push and pull factors off-line when autistic individuals physically interact with associates, friends and family members who are involved in terrorism. Even if individuals are socially active, they may still find the social space exhausting and experience some level of anxiety and see the offline space as a comforting retreat. They may see it as a platform through which to pursue their intellectual interests and not recognise the social dynamics of online communications, seeing them as a platform for mere information transfer rather than vehicles for social exploitation. Thus, the online space can have a pull either because it can offer stress-free social interactions or offer what appear to be intellectual opportunities which are, unknown to the autistic individual, platforms for social influence.

Finally, social/communication impairments can play an indirect as well as direct role in push and pull factors. Social and communication impairments may contribute to social adversities (e.g., bullying, lack of friendships and intimacy, negative reactions from others and social humiliation) earlier in life. Such adversities may then lead to distress, resentment and anger that festers for many years and later (i.e. during adolescence or adulthood) manifest as push factors towards revengeful ideologies and groups, including terrorism, political/celebrity assassinations, mass killings, school shootings, serial killings and other forms of violence. Such acts of violence are typically enshrined in narratives of revenge against the oppressive bullies in society/politics and defence of and empowerment of the oppressed or disaffected. Social adversities arising from ASD and others' unjust reactions to it can create a push towards such narratives. It can also make narratives of superiority and mastery have a strong pull for an individual who feels so socially disempowered and ineffective.

Implications for resilience and diversion

Supporting individuals to cope with the unavoidable social demands and stressors of life is important but it is also important to remove disadvantages brought about by ASD, where possible, in order to enable the individual to thrive socially, academically and occupationally. This will boost resilience by diminishing the push factors towards extremist social groups and narratives of injustice. In order to reduce the pull of such groups, support to recognise their exploitative nature as well as the hazards of online and offline interactions with extremists may be helpful. If the online space continues to be a legitimate part of that individual's life, online safety awareness may assist. If the individual would benefit from increased offline social interactions and opportunities, social coaching as well as signposting to social environments in which they can thrive and manage the demands may be helpful.

Facet 6: cognitive styles

Function

ASD has been associated with a number of neurocognitive profiles, although it should be noted that individuals with ASD are very heterogeneous in their neuropsychological profiles and may even perform differently at different times and on different tasks (Hill, 2004). Therefore, professionals working with individuals on the autistic spectrum should endeavour to establish each individual's strengths and impairments. At least four aspects of neurocognitive functioning may come to bear on push and pull factors, namely theory of mind, central coherence, systemising and attention-shifting.

Theory of Mind: The ability to understand how others think/feel when this differs from our own perspective is reliant on 'theory of mind'. This ability

facilitates self-awareness, the ability to read others' agendas, an appreciation for the impact of one's behaviour on others and empathy. It also assists the individual to monitor how they are perceived and appraised by others, in order to adjust their behaviour to social norms and relational expectations. Impairments in this ability in some autistic individuals (Baron-Cohen, 2000) may hinder social communication and interaction skills as well as leave the individual vulnerable to exploitation by others whose agendas are not obvious to them. It may also limit the individual's appreciation for how their behaviour affects others.

Central Coherence: ASD has been associated with the tendency to over-focus on fine detail or strong 'local coherence' alongside a tendency to overlook the bigger picture or weak 'central coherence' (see Happe & Frith, 2006 for a review). One consequence of weak central coherence is impaired cause-effect linking, including impaired ability to recognise the links between events and between one's own behaviour and its consequences (Hill, 2004). Furthermore, weak central coherence has been argued to underpin 'context blindness' (Vermeulen, 2012) or an impaired ability to consider the subtle and variant contexts to events, including social contexts. Overall, the individual may over-focus on details at the expense of the bigger picture of their and others' behaviour, struggle to foresee the consequences of their actions and fail to see context through which behaviour is interpreted.

Systemising: Individuals on the autistic spectrum may show a strong systemising tendency whereby they process and organise the world and information as systems, facts and categories, alongside an impaired empathising ability to understand the social and emotional nuances of events and the world in general (Baron-Cohen, 2002). This could heighten the need for a logical world whereby people and events can be ordered into systems, categories, hierarchies, theories and facts and make the social and emotional aspects of the world and behaviour confusing and unpredictable.

Attention-Switching: Individuals with ASD may exhibit impaired attention-switching, which could hinder their mental flexibility and ability to move from one topic/idea to another (Hill, 2004). This could contribute to hyper-focus and fixation, especially when they develop an interest or pre-occupation. In day-to-day life, their ability to cope with multiple conversations, stimuli and sources of noise/visual information can be impaired, leading to social, academic and occupational difficulties in some instances. Visual stimuli may have more salience and hold attention more, especially when non-social information is presented (see Wang et al., 2015 for a review). This could make visual stimuli compelling and salient whilst making shifting attention away from them challenging, making some visual imagery captivating and hard to 'let go' of.

Role in push and pull factors to extremism

A combination of impaired theory of mind, empathising and central coherence could make the individual less aware of extremists' agendas and/or the consequences and bigger picture of their own involvement in terrorism. They may not have intuitive empathy for the victims (outgroup) and overlook the agendas of the terrorists (ingroup) and fail to see the agenda behind propaganda and take it literally. They may also miss the contextual aspects of terrorism (e.g., assuming that an extremist theory/solution will be effective across contexts or that a terrorism-related fantasy they have based on a book or website translates into reality). Finally, an individual with ASD may engage in numerous behaviours and interests that to others appear to link (and collectively suggest a broad and strong commitment to terrorism) but to them may be compartmentalised and not connect into a bigger picture. For example, they may pursue an interest in explosives whilst also collecting detailed information on terrorist groups, but may not see the bigger picture of how these activities may be seen by others to collectively suggest intent to detonate explosives in furtherance of a terrorist cause. All the aforementioned impairments may act as push factors in that they limit a number of normal inhibitions and deterrents to engaging in terrorism. Once an individual is engaged in terrorist pursuits and interests, they may find it difficult to shift their focus away from them and this could maintain their engagement and the push factors. The individual may struggle to shift their attention towards other activities/life goals and instead become immersed in their terrorist pursuits, without seeing how the latter may compromise their otherwise law-abiding life. Thus, neurocognitive factors can not only act as push factors by lifting inhibitions on engaging in terrorism but also by obscuring the individual's appreciation for the consequences of terrorism for themselves and others.

Terrorist activity may also have a pull power due to neurocognitive aspects of ASD. For example, fine-detailed research and technical activities associated with terrorism may have a particular appeal as they appeal to local coherence. Extremist narratives and theories are typically systemising and deliberately avoid empathising with the outgroup, often portraying the problem and target group in factual terms and simplifying the problem into categories of superior ingroups and inferior/destructive outgroups. They may endorse a natural order of the world whereby hierarchies and systems of behaviour need to be restored and depict nostalgic historical periods whereby the world was organised into neat categories and systems, overlooking the social and emotional contexts of how society operates and the bigger picture of human behaviour/terrorism and its consequences. Finally, modern day terrorist propaganda relies heavily on visual stimuli which can become compelling and may be harder to shift attention away from. Overall, terrorist theories,

propaganda and activities may all have a pull for individuals with ASD if they appeal to their natural neurocognitive styles.

Implications for resilience and diversion

Where theory of mind is impaired, the individual with ASD may need support to function socially in their day-to-day life (and redress the social/occupational difficulties this may lead to) as well as to be guided to recognise the harm that terrorism causes its many victims, including their own family as secondary victims. They could be supported to understand the agendas of extremists and the wider context in which the propaganda they produce operates. Where they have weak central coherence, the consequence and broader impact of their terrorist involvement may need to be highlighted and they need to be supported to understand how their behaviours/interests are perceived as a collective. If they struggle to shift attention from terrorism and its detailed pursuits (due to local coherence), distraction strategies and alternative detailed and visual stimuli that relate to safe interests may be helpful. Finally, as well as guiding their empathising, it is important to present systemising counter-extremist theories of the world that enable the individual to organise the world into a non-extremist systemising theory that their mind finds logical. Factual enquiries and research into arguments against terrorism can be helpful and engaging.

Facet 7: sensory processing

Function

There are three sensory factors associated with ASD that are worthy of consideration. Firstly, sensory hypersensitivities could lead an individual to find sensory stimuli in one or more sensory modalities overwhelming and aversive (see Bogdashina, 2003; Rogers & Ozonoff, 2005 for reviews). As a result many environments outside the home could have an adverse impact on the individual's health and well-being and limit their access to social, academic or occupational opportunities. Secondly, sensory hyposensitivities mean that the individual may have a heightened need for and seek out sensory stimulation in one or more sensory modalities. Such stimuli are experienced as rewarding, comforting and restorative of well-being. This could include inappropriate/harmful stimuli which are sought out due to their sensory appeal. Thirdly, some individuals with ASD may have a particular strength in visual processing (Samson et al., 2012) which renders visual stimuli, especially those which relate to their hyposensitivities, very compelling. These visual stimuli are more likely to be encoded and stored in memory and may feature in vivid thoughts and fantasies.

Role in push and pull factors to extremism

Sensory hypersensitivity may contribute to adverse experiences and loss of positive opportunities for success and this may indirectly serve as a push into terrorist involvement if it were to fuel grievance and a sense of injustice and anger. Furthermore, the online space may have greater pull as it removes many of the sensory stressors that are associated with off-line environments and offers a primarily visual mode of interaction, communication and learning.

Terrorist propaganda and materials may have a sensory pull if they meet sensory needs associated with hyposensitivities. For example, the colours, lights, smells and noises of explosives may have sensory appeal and hence a strong sensory pull. Detailed, colourful visual stimuli (terrorist imagery, magazines, diagrams, flags, murals, uniforms, weapons and paraphernalia that have an aesthetic appeal) may also have a particular strong sensory pull. Overall, it is important to explore if sensory overload acted as a push factor, sensory relief and visual aspects of the online space had a pull and if terrorism-related materials had sensory pull, in order to delineate the sensory functions that shape vulnerability to terrorism.

Implications for resilience and diversion

Where an individual's life and well-being are adversely impacted by hypersensitivity, support should be focussed on negotiating reasonable adjustments where possible (e.g., at place of education or employment) as well as to support them to access opportunities that are more commensurate with their sensory tolerance and needs. The online space may always feel more comfortable and safeguarding and awareness of online safety may enable the individual to enjoy the benefits of the online space whilst safeguarding themselves from its hazards. Where terrorism is fuelled by hyposensitivities, safe visual or other stimuli with sensory pull could be encouraged in order to offer alternative sources of rewarding sensory stimulation. Where possible, aversive sensory stimuli should be minimised and safe stimuli that offer sensory reward should be maximised, in order to enhance sensory resilience.

Summary & conclusions

ASD does not constitute a risk factor for terrorism in the general population and even in terrorist offenders with an ASD diagnosis, there is no evidence to suggest that ASD plays a causal role. Instead, different aspects of ASD may interact to contextualise push and pull factors in a nuanced way. Such a contextual role may differ from individual to individual and it is imperative that an individualised case formulation approach is used to identify if and how facets of ASD contribute to push and pull factors (Al-Attar, 2018b, 2018c).

Of course effective case formulations should also consider the diversity and heterogeneity of ASD and the role of co-morbidity in an individual's pathway. Such a formulation should then form the basis for intervention, support and diversion approaches. The current paper offers a framework for the development of such formulations, which is theoretically and clinically grounded. The aim of such a framework is to offer guidance on how to identify vulnerabilities/risks contextualised by ASD and turn these into strengths by responding to the push and pull factors that interact with ASD.

Formulations of risk should take into account the individual's holistic functioning, with ASD being one of many important considerations. Needless to say, individuals with ASD may also be impacted and influenced by an array of factors unrelated to ASD and all factors impacting the individual should be considered within their developmental, cultural and situational contexts, when working with individuals with ASD who have committed terrorism offences. ASD is life-long and should not be stigmatised or mistaken for risk. Furthermore, there is very little if any empirical evidence on autism-terrorism links, and knowledge in this area remains very limited. Nevertheless, doing nothing is not an option for practitioners and the most ethical approach to take is a theoretically, clinically and operationally informed approach that empowers the individual and protects the public. The current paper is a step towards developing such an approach. However it is only a small step in the very early part of a journey towards a more theoretically and empirically developed area of research and practice.

Disclosure statement

No potential conflict of interest was reported by the author.

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