Breaking up the Bubble: Improving critical thinking skills and tolerance of ambiguity in deradicalization mentoring.

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Abstract

In response to a complex world, radicalized individuals tend to retract into black-and-white thinking, preference for easy solutions for complicated problems, or belief in conspiracy theories. These individuals are often characterized by low cognitive complexity, lack in ability for perspective taking, as well as intolerance of ambiguity. Hence, it stands to reason that successful deradicalization processes might require addressing such patterns of thinking, ideally resulting in improved critical thinking skills. With this goal, a governmental deradicalization program in the state of Baden-Wurttemberg in Germany (Competence Centre Against Extremism, konex), is field testing innovative cell phone application-based methods since June 2021. The utilized tool is a news aggregation application that presents different perspectives on current (socio-) political topics based on editorial curation. Since deradicalization work is recommended to be tailored to individual needs, the application allows for context specific discussions and creative interventions (e.g., storytelling) based on the featured topics. This article presents the theoretical framework and underlying theories of change for the application's implementation in day-to-day deradicalization work, especially focused on the improvement of critical thinking skills, tolerance of ambiguity, and perspective taking. Furthermore, the tool is being used to address existential uncertainties, conspiracy beliefs, as well as a lack of media literacy skills.

Keywords: Deradicalization, Critical Thinking, Tolerance of Ambiguity, Media Literacy, Cell Phone App, Methods

Introduction

Extremists often display a cognitive tendency towards rigid black-and-white thinking styles (Backes, 1989; Liht & Savage, 2013; van den Bos, 2020). This might be a reaction to a complex and ambiguous world and a strategy to reduce stress, cognitive dissonance, or related existential uncertainties (Bonfá-Araujo et al., 2021; Jost et al., 2003). Conspiracy theories also serve this purpose and have played a role in recent terror attacks such as in Christchurch, New Zealand, El Paso, USA, or Hanau, Germany (Crawford & Keen, 2020). Narrow and rigid

worldviews as well as black-and-white thinking are often amplified in extremist groups, together with an opportunity for collective or social identity development, which might decrease feelings of uncertainty but also promote out-group bias (Doosje et al., 2016; Hogg et al., 2013; Hogg & Adelman, 2013). Out-group thinking is often accompanied by stereotypical attribution of others (Othering) and even devaluation, dehumanization, and hostility (Harris et al., 2014; van Prooijen et al., 2015). As Jensen et al. (2020) report, individuals who wanted to leave an extremist group were struggling to overcome the dehumanizing rhetoric directed at out-group members they had developed. Hence, cognitive rigidity and Othering could complicate processes of deradicalization and disengagement.

Ideally, deradicalization and disengagement counseling is based on and tailored to the individual needs of program clients and reactive to the specific context in which the exit process takes place (Jensen et al., 2020; Koehler, 2017b). Apart from protecting the society from future crime through facilitating desistance from extremist behaviors including violence, the focus also often lies on cognitive change in clients as well (Allroggen et al., 2020). While ideological beliefs are not always challenged directly in all of these programs, deradicalization work nevertheless often includes methods designed to improve critical thinking skills (Costa et al., 2021) and self-reflection of personal worldviews, which are believed to assist distancing processes from extremist attitudes (Allroggen et al., 2020; Tepper, 2020). Due to the needs-based approach of many deradicalization programs, a variety of tools and methods are used, such as for example building a rapport between client and counselors to address practical challenges associated with disengagement such as labor market reintegration, inclusion into mainstream society, tattoo removal, or psychotherapy (Allroggen et al., 2020; Koehler, 2017b). However, methodological approaches in deradicalization work are still significantly under-studied and often disconnected from the state of the art in radicalization and deradicalization research (Koehler & Fiebig, 2019). With regard to the increasing scientific evidence base of relevant aspects for radicalization or deradicalization processes (e.g., cognitive rigidity, conspiracy beliefs), new and innovative methods to respond to the growing body of knowledge should be discussed and tested. Those methods should be based on elaborated theoretical frameworks and theories of change to provide the basis for impact or effect evaluation (Koehler, 2017a). This article presents the

theoretical underpinnings of a news aggregation cell phone application (in the following called "the app") that is being field tested in a governmental deradicalization program in Germany to allow for replication and methodological adaptation in other programs and contexts. The goal of the app's use is to improve cognitive flexibility, perspective taking skills, as well as (critical) media literacy. Since the app has only recently been incorporated (June 2021) into the deradicalization and disengagement program, the paper does not provide empirical insights into outcomes and impact of the app usage. Instead, the article provides the theoretical basis and empirical foundation of the app's implementation. The paper is structured as follows: After presenting a short overview into current insights in radicalization and deradicalization research, the context of implementation and the applied tool are described. Afterwards, expected effects and their empirical foundations are discussed and, finally, conclusions are drawn regarding the implementation of the app.

Research on radicalization and deradicalization processes

A variety of definitions and theoretical explanations were proposed over the years to describe radicalization processes including stage models discussing phases that lead to adopting violence legitimating views and committing extremist acts (Moghaddam, 2005; Silber & Bhatt; Wiktorowicz, 2005). With their two-pyramids model, McCauley and Moskalenko (2017) recognize the growing need to distinguish between radicalization of opinions and radicalization of action which was already suggested by Horgan (2004). According to McCauley and Moskalenko (2017) those at the apex of the opinion pyramid show willingness to use violence for a cause while those at the top of the action pyramid actually commit violence. McCauley and Moskalenko (2017) conclude that radicalization of opinions requires different preventive approaches than extremist violence. While most sympathizers of violence usually do not engage in extremist actions (Khalil et al., 2019; McCauley & Moskalenko, 2017), Khalil et al. (2019) explain in their attitudes-behaviors corrective (ABC) model that radicalization is a dynamic process and sometimes individuals change their behavior as well as thought patterns (i.e., sympathy for ideologically justified violence). A valuable theoretical model to explain the gradual shift towards the support for violence based on a political or

religious ideology is the depluralization of political concepts and values (e.g., justice, freedom, honor, democracy). Within this theory, the development of extremist attitudes involves the individual decrease of perceived solutions to societal or personal grievances in combination with an increased sense of urgency to act (Koehler, 2016).

In contrast, deradicalization can be understood as a process of repluralizing the perception of different values and political concepts that is connected to reducing the support for as well as the use of politically motivated violence (Koehler, 2016). Similar to the distinction of radicalization towards action versus attitudes (e.g., Borum, 2011; McCauley & Moskalenko, 2017), pathways leading away from extremist involvement are often distinguished in disengagement and deradicalization (Berger, 2016; Horgan, 2008). The former relates to ceasing actions for a certain cause, while deradicalization is a more attitudinal-related process that pertains to cognitive changes in individuals (Horgan, 2008; Khalil et al., 2019).

The literature on processes of radicalization as well as involved phases and push or pull factors is extensive. Recent systematic field reviews have pointed out a number of well-established and empirically based core mechanisms. As Gøtzsche-Astrup (2018) concludes in his review, motivational processes that can be triggered by negative life experiences and experiences of uncertainty are related to radicalization. Additionally, identity fusion and small group dynamics add to the willingness to engage in violent actions and certain individual-level factors also play into radicalization process Among such individual-level factors are for example fundamentalism and dogmatism (Gøtzsche-Astrup, 2018) which are related to rigid cognitive thinking styles (Jost et al., 2003; Zhong et al., 2017). Rigid thinking is often displayed by radicalized individuals across different ideologies (Zmigrod, 2020). Liht and Savage (2013) argue that extremist ideologies display clear hierarchies in their integral values and promote value monism instead of pluralism. Value monism offers simple worldviews disregarding the complexity of real-world issues. Integrative complexity, i.e., cognitive flexibility instead of rigid thinking, and the ability to perceive and accept different perspectives, however, can theoretically have the effect to break up value monism and black-and-white thinking (Liht & Savage, 2013; Savage et al., 2014), which could lead to the facilitation of deradicalization.

Black-and-white thinking generally helps people involved in radicalization processes to make sense of a complex world and decrease uncertainties as well as perceived ambiguities (Adorno, et al., 1950; Zmigrod et al., 2019). Fulfilling personal needs for cognitive closure and simple explanations for complicated or challenging problems have been found to be often occurring byproducts of extremist views as well as belief in conspiracy theories. Recent terrorist attacks have also been fueled by strong conspiratorial mindsets and convictions (Crawford & Keen, 2020; van Prooijen, 2018; Wheeler, 2021). Furthermore, intolerance for ambiguity is accompanied by rigid as well as prejudiced thinking and related to the need of structure and cognitive closure (Furnham & Marks, 2013; Jost et al., 2003; van den Bos, 2020; Zhong et al., 2017). When individuals are uncertain about their life or their identity, they might strive to resolve these uncertainties (Hogg, 2021). These individual needs (e.g., resolving uncertainty, need for cognitive closure, need for belonging, etc.) play a central role in radicalization through motivational processes to fulfill them (Gøtzsche-Astrup, 2018; Kruglanski et al., 2017). If extremist groups promise to fulfill such needs for example by offering simple solutions to complex problems or again of personal significance, they could increase their attraction especially for uncertain or vulnerable individuals (Hogg, 2014; Kruglanski et al., 2014).

Dynamic group processes can also enhance radicalization especially if relative deprivation (e.g., discrimination) of oneself or the in-group is experienced (Feddes et al., 2015; Gøtzsche-Astrup, 2018; Vergani et al., 2020). Often, the out-group is devalued and empathy towards them decreased (Hudson et al., 2019). Furthermore, stronger identification with the in-group is associated with higher willingness to sacrifice oneself for the group as well as with hostility towards out-group members (van den Bos, 2020; Zmigrod et al., 2019). Willingness to engage in (violent) behavior benefiting the goals of the group can be traced to a process called identity fusion (Atran, 2017; Swann et al., 2012). Identify fusion occurs when individuals experience a "feeling of oneness with a group" (Swann et al., 2012, p. 442) meaning group identities and values are integrated into the personal self-concept and a strong connectedness to the group occurs. This commitment to the group and its norms and values increases willingness to make sacrifices for the group (Atran, 2017; Swann et al., 2012). While identity transformation plays into radicalization processes, it is also a major driving

force to facilitate reintegration into society according to the Phoenix Model of Disengagement and Deradicalization (Silke et al., 2021). Based on an extensive literature review, Silke et al. (2021) discovered that turning away from extremist identities and forming an alternative, non-violent identity is a key component for deradicalization and disengagement.

Due to its outreach, the internet also plays an important role in radicalization processes (Meleagrou-Hitchens & Kaderbhai, 2017). Offline and online components in radicalization trajectories show a dynamic and hybrid interaction (Meleagrou-Hitchens & Kaderbhai, 2017; Valentini et al., 2020), which is why Valentini et al. (2020) suggested the term "onlife" to reflect the intertwined nature of both realities. Lacking awareness regarding recruitment mechanisms and strategies of extremist groups can lead to unintentional online engagement with these milieus and their propaganda contents (Schmitt et al., 2018). Some studies have shown that people in different countries (e.g., USA, Germany) have inadequate media literacy and, therefore, experience difficulties in grasping the intent behind certain online messages (Meßmer et al., 2021; Vogels & Anderson, 2019). This might make it difficult to detect extremist positions and weaken resiliency against recruitment attempts. In contrast, digital media literacy has been connected to increased ability to assess information regarding its accuracy and therefore could protect against radicalization through the moderating factor of critical thinking skills (Bulger & Davison, 2018; Dubois & Blank, 2018; Nienierza et al., 2021; Zada et al., 2019). Since media literacy could help strengthening critical thinking, disengagement and deradicalization processes could also benefit from improving media literacy.

Two further phenomena related to radicalization in online contexts are the so called "echo chambers" and "filter bubbles" (e.g., Stark et al., 2021). Filter bubbles are a technically driven mechanism that includes algorithmic filtering of concurring views and contents that suit the individual's interest (Pariser, 2011; Stark et al., 2021). Echo chambers on the other hand are virtual spaces in which personal opinions are reflected and reinforced by like-minded individuals while different viewpoints are excluded or minimalized (Stark et al., 2021). Such "echoing" has been shown to be an influential factor for example in the online radicalization of extreme right lone actor terrorists (Mølmen & Ravndal, 2021). Different motives such as reducing cognitive dissonance or cognitive biases often lead individuals to seek out one-sided

information (both on- and offline) that confirm their own worldviews. Thereby people try to avoid negative emotions by evading confrontation with diverging views or to reduce cognitive resources necessary to integrate different opinions (Kim, 2015; Stark et al., 2021). Although, according to recent studies, only a fraction of individuals finds themselves in echo chambers (Dubois & Blank, 2018; Rau & Stier, 2019), perception of diverging views does not necessarily indicate that differing opinions are valued and integrated because, for example, cognitive dissonance, as Jeong et al. (2019) point out, can be activated by confrontation with opposing views.

Aims and objectives

Deradicalization and disengagement are multi-faceted processes and therefore require various approaches and methods to facilitate and support them (Costa et al., 2021; Koehler, 2017b). This article introduces the theoretical framework for one tool to assist deradicalization counselling in the form of a mobile phone application that is currently field tested by a German disengagement and deradicalization program. The field-testing will help to clarify whether the app can fit into the counselling process at all and if the theoretical expectations translate into the practical work. Following the understanding that repluralization is the process of strengthening the perception of different values and political concepts to decrease the urgency to act violently (Koehler, 2016), the goals of the app (i.e., strengthen certain mental competencies such as cognitive flexibility as well as perspective taking and to help clients develop a stronger tolerance for ambiguity) are expected to contribute to ceasing violent actions or involvement in extremist groups (disengagement) as well as promote deradicalization. The tool itself, however, must be seen as an additional method to an already existing set of measures tailored to the clients' needs and not as a stand-alone intervention. It can only be one piece in a multi-method approach.

Since a solid theoretical foundation and elaborated theory of change is essential to understand, implement, and evaluate the causal mechanisms and effects of such tools (Gielen, 2019; Nehlsen et al., 2020), this article will proceed with describing the context of implementation and the tool in detail. The article then outlines the theoretical mechanisms

associated with the app's use in a deradicalization counselling setting. It will also discuss which methods can accompany the use of the app. No conclusions are given on actual implementation yet.

National context

Germany is one of the countries with the largest number of P/CVE programs and a long tradition of governmental and non-governmental activities in this field. An online database developed by the German Federal Criminal Police Office (Bundeskriminalamt – BKA) lists more than 2,000 (as of December 2021) P/CVE programs from different actors for different target groups and extremist ideologies with projects sometimes addressing several groups and phenomena (Lützinger et al., 2020). Almost 60% of programs are carried out by non-governmental actors in Germany (Lützinger et al., 2020). Primary preventive programs are usually designed for the wider population (e.g., communities, students), projects for individuals at-risk for radicalization are defined as secondary prevention, and those reaching out to individuals already engaged in an extremist scene are considered tertiary prevention (Lützinger et al., 2020; Romaniuk, 2015). The majority of German programs (based on two very recent mapping projects more than 80%) provide primary prevention (Freiheit et al., 2021; Lützinger et al., 2020). The project presented in this paper can be considered tertiary prevention. This generally encompasses different approaches, among others offering support for families of radicalized individuals, trainings for practitioners, as well as deradicalization and disengagement programs. The latter approaches make up around 6% of the interventions in Germany and aim to assist people to disengage and deradicalize from extremist groups and networks. The ratio of exit programs is highest for prevention of Islamism (11%). In contrast, the focus on deradicalization and disengagement programs for right-wing extremism is smaller, since only 5% of projects targeting right-wing extremism offer exit work. (Lützinger et al., 2020). Projects for individuals disengaging from left-wing or non-religious foreign forms of extremism (e.g., Turkish right-wing or left-wing scenes, or members of the Kurdistan Workers' Party, PKK) are even less frequent despite high numbers of potential extremists (Bundesministerium des Innern, 2021; Lützinger et al., 2020).

Koehler (2016) has given a first systematization of applied tools in deradicalization work throughout the world. The main approaches including ideological work, social work, psychological counselling, educational tools such as vocational training and promoting critical thinking as well as sports and creative arts (Koehler, 2016; Koehler & Fiebig, 2019), have also been found for the German context: through expert interviews, Waleciak (2021) was able to detect four major themes and methods applied in the German context. These include 1) securing basic socio-economic needs such as housing or work, 2) applying systemic therapy, 3) offering psychosocial help (e.g., stabilizing mental health, improving self-reflection), and 4) conducting ideological work on religion, politics, and, generally, own worldviews. Under consideration of these approaches of deradicalization programs (Waleciak, 2021), the intention of the app's implementation can be categorized as addressing psychosocial (e.g., emotions of uncertainty, perspective taking), as well as ideological aspects (i.e., promoting reflection processes on extremist worldviews).

Context of implementation

The tool is now implemented and field tested in a tertiary preventive context by the German governmental deradicalization program konex. The counselling service of this program is aimed at individuals who want to leave an extremist milieu or ideology. It also offers support to families of radicalized individuals. The konex program targets all four main forms of violent extremism as listed by the politically motivated crime typology used by German police agencies: extreme right and left, religiously motivated extremism (mostly Islamic extremism), and so-called foreign extremism (Ausländerextremismus), which includes involvement in or commitment to extremist organizations located outside of Germany (e.g., the PKK). Since deradicalization processes are highly individual (Koehler et al., 2018), the konex program is adapted flexibly to the individual's needs regarding content and duration of participation. It is based on individual risk factors and can, therefore, include general social work as well as ideological work. Quality standards ensure a certain level of standardization (Koehler, 2017b). The konex program, albeit not in its current size and scope, exists since December 2015 and was financed as well as administered by the state's Ministry of the

Interior. In January 2022, the program was transferred to the State Office for Criminal Investigation (Landeskriminalamt), after the program had been expanded to include, among other fields of activity, deradicalization and family counselling for all forms of violent extremism listed before, a research division tasked with supporting the deradicalization counselling through exploration of new methods as well as quality monitoring and fundamental research on extremism and terrorism, and a state-wide P/CVE training center for expert personnel (Koehler et al., 2018).

The tool

The cell phone news aggregation application used in the deradicalization intervention by konex is the same app that is available to the general population. The cell phone application and its underlying service are commercial and have not been developed with the aim of assisting P/CVE work. Currently, it is implemented in school settings to combat fake news and conspiracy beliefs (Matsche, 2021). The tool with its external technical and editorial service was procured by konex for the field trial and provided to the clients for free.

The app presents articles to the user that have been curated by an editorial board of professional journalists to display different opinions and socio-cultural as well as political perspectives on a defined set of current affairs (e.g., current political debates, perspectives on lifestyle questions such as veganism or health). The topic selection by the editorial board is based on societal relevance and public interest gathered through intensity of public debates around certain issues. The aim of the curating team is to present a wide variety of perspectives and framings for each selected issue, thereby exposing users to a pluralist discussion on societally relevant topics. Three current topics of which one focuses specifically on an on-going controversy are presented daily. Usually, four to six perspectives on the topic are presented and users can choose between reading the provided short summaries or the full articles. These articles are drawn from different sources and include among others reports, editorials, or features from major (German and international) newspapers but also blogs, online magazines or scientific publications. Publications from sources that have a history of violating journalistic quality standards or democratic discourse are assessed closely before

inclusion in the app. Articles that do not adhere to journalistic quality standards and/or share extremist or misanthropic perspectives are excluded.

Implementation and topic selection

Just like the voluntary nature of the entire program, the use of the tool is also non-mandatory. Counsellors decide with the client whether he is interested in using the app. The app is, therefore, an addition to other counselling work. The benefit of the app is a specific enabler to facilitate strengthening competencies. Usage can depend, for example, on whether other more pressing issues (e.g., accommodation, social stabilization) need to be solved first before working on underlying psychological or ideological aspects such as low tolerance of ambiguity or critical thinking. The app can help to open up discussion on certain topics but also form the basis for different intervention methods (e.g., role-playing) as will be described below. The app is first introduced and applied in tandem with the counsellors. Ideally, it becomes a source for the clients later on to further practice perspective taking on their own and have a wealth of heterogeneous information. If the client encounters ambiguous topics in the app, he can always take these subjects into the discourse with the counsellors.

When first implementing the app, the wide array of subjects available in the app offers numerous possibilities to get clients interested. The ideological context of the person receiving the counselling as well as the individual radicalization drivers are key to understand and select the most appropriate discussion topics from the app's portfolio. The client's interest to engage with the issue together with the aimed effects and potential impact on the specific ideological belief construct or characteristics of the respective extremist environment are essential factors to take into consideration here. Clients should be given time to get familiar with the app and choose the topics according to their liking. In the following, I will proceed with describing how a tool that was not initially designed to promote deradicalization or disengagement can be put to use in this context.

Desired effects and empirical foundation

Critical thinking and cognitive flexibility

Previous scholarship and practical experiences in other P/CVE programs can help to elaborate the theory of change and desired effects for the successful application of this app in deradicalization counselling. Improving critical thinking has been recognized to play an important part in deradicalization (Koehler, 2016). Fostering cognitive complexity could be one way to promote such critical thinking styles (see Savage et al., 2021). Liht and Savage (2013) suggest that cognitive complex thinking is based on differentiation, i.e., the ability to perceive different views and opinions. In their theoretical model, differentiation is followed by accepting the right of others to hold their own values and standpoints, as well as treating them as equally valid as one's own. This value pluralism in theory diminishes black-and-white thinking (Liht & Savage, 2013). Finally, Liht and Savage (2013) argue that integrative complexity can be reached through the ability to recognize similarities across different values, enabling individuals to find solutions for problems that account for differing standpoints (Liht & Savage, 2013). A number of P/CVE interventions that predominantly work with Muslims have been based on this concept of integrative complexity (Boyd-MacMillan, 2016; Liht & Savage, 2013; Savage et al., 2014; Savage et al., 2020; Savage & Fearon, 2021) and apply a somewhat similar approach as utilized with the app. Instead of news articles, these previous P/CVE programs expose their clients to video clips showing individuals supporting different relevant standpoints regarding question such as: "how should young Muslims live in the West?" (Liht & Savage, 2013, p. 49). Since most of these P/CVE programs were implemented in group-settings, practicing critical thinking was then promoted through discussion as well as other formats of interaction between the group members such as role-playing. While existing evaluations of these approaches report positive effects, the majority did not apply control groups, which limits conclusions on causality as well as the generalizability of the findings.

Among the five evaluated programs, one included among others former members of the Islamic Al-Shabaab-militia (see Savage et al., 2014). The former Al-Shabaab members showed – just like the other participating individuals (including at-risk individuals without ties to Al-Shaabab, as wells as practitioners) – an increase in cognitive complexity, although

the former members' increase was much smaller in comparison to the other participants. Notably, the intervention took place over a period of four days, which might not be enough to have a lasting effect on extremists who are deeply entrenched in rigid thinking. Therefore, longer intervention durations seem to be advisable to achieve greater impact (Savage et al., 2014). Nevertheless, cognitive complexity of participants increased especially with regard to the perceived in-group suggesting that the in-group is more critically assessed than before. As a result, participants became more aware of potential inconsistencies within their reference group in relation to their own identity and personal values or norms, which can lead to a more differentiated perception of their social identity and the in-group in general (Savage et al., 2014). Generally, critical thinking skills might raise awareness regarding negative aspects of extremist ideologies and milieus, including devaluation of others or "us versus them"-thinking. This in turn could cause disillusionment, which has been shown to be an important push factor in disengaging from different types of extremism (Jensen et al., 2020; Koehler, 2021; Lösel et al., 2020).

Another example of how critical thinking skills in addition to emotional expression training have been applied in deradicalization work has been documented in the context of an Indonesian program aimed at terrorist inmates (Muluk et al., 2020). Here, instead of presenting differing opinions and standpoints, participants received theoretical input on cognitive processes and were encouraged to reflect on their own thinking styles. In a role-playing exercise, participants practiced their problem-solving skills. The outcomes of the program evaluation, albeit limited again by the lack of a control group, did not find increased support for a non-militant lifestyle after receiving the intervention. However, an interaction effect with the second intervention that was applied to improve emotional expression skills including the ability to know, specify, and describe emotions was identified. Participants with both higher cognitive flexibility as well as emotional expression showed higher support for a non-militant lifestyle compared to individuals with low cognitive flexibility. When cognitive flexibility was high, however, and emotional expression low, there was less support for abstaining from violence thus indicating that both cognitive and emotional are relevant for deradicalization (Muluk et al., 2020). The methods used to promote emotional expressions again included theoretical input on emotions. In addition, a storytelling approach that includes

telling and writing down a story was used for emotional skills training. Participants wrote stories about emotions of protagonists in a previously presented story (Muluk et al., 2020). As to how and why storytelling can be successful in preventing involvement in violent extremism, Leener (2019) argued that creating and telling a story can strengthen critical thinking due to the cognitive skills that are activated including perspective taking and other cognitive strategies to evaluate and integrate multiple viewpoints (Leener, 2019).

Drawing from these findings and previous experiences in other deradicalization programs, dealing with differing opinions and perspectives offered through the app can be assumed to have a potential strengthening effect on critical thinking skills by promoting integrative complexity and value pluralism. This could promote deradicalization processes by repluralizing clients' narrowed worldviews and breaking up black-and-white thinking patterns. Practically, discussion sessions between the client and the counsellors might facilitate this effect. These discussions should also encourage cognitive as well as emotional reflection of the content.

Since deradicalization work should be needs-based (Koehler, 2017b), and certain programs suggest different pathways to strengthen critical thinking (Muluk et al., 2020; Savage et al., 2014), it is also advisable to maintain and apply a plurality of methods beyond discussion sessions alone. This could include sequences of role-playing exercises or storytelling, although the willingness of the participant to engage as well as the availability of topics the client is interested in certainly impacts the choice of application methods. For example, it would be easier to tell stories about and identify with individuals rather than institutions. Therefore, if the chosen topics focus for example on individual accounts of migration other methods might be applicable than, for example, for more abstract topics (e.g., debates on economics), which might need a more discussion-based approach.

Tolerance of ambiguity

Strengthening cognitive complexity and breaking up black-and-white thinking patterns is associated with higher tolerance of ambiguity (Boyd-MacMillan, 2016; Liht & Savage, 2013; Savage et al., 2014; Savage et al., 2020), creating another potentially valuable effect for deradicalization interventions. Apart from cognitive rigidity, people with low tolerance of

ambiguity often display fear of uncertainties and are susceptible to cognitive biases (Schirrmeister et al., 2020). As Bouko et al. (2020) have shown for online extremist propaganda, narratives and styles to trigger biases in individuals are widely common. This work is part of the EU project Prevention of Youth Radicalisation Through Self-Awareness of Cognitive Biases (PRECOBIAS) which includes scientific research on cognitive biases related to radicalization as well as an online campaign and a toolkit for teachers to raise awareness among students by conveying knowledge on thought processes through activities that visualize cognitive biases as well as discussion (Bouko et al., 2020). Such debiasing, i.e., raising awareness on thought processes, could, furthermore, have a preventive effect for example against committing a suicide attack (Bou Khalil & Richa, 2018). While evidence regarding what works best to achieve debiasing is inconsistent (Koehler, 2016; Lilienfeld et al., 2009), raising awareness seems to be a plausible theoretical consideration that can be integrated into the use of the app.

Low tolerance of ambiguity is further related to fear of uncertainties, which are often fueled by an instable self-worth or a diffuse identity (Furnham & Marks, 2013; Hogg & Adelman, 2013). As extremist group membership often offers identification to a cause and reduction of self-related uncertainties, self-worth and identity need to be strengthened outside this extremist group, since identity transformation, for example by breaking up fused group identities, plays an important role to promote disengagement (Feddes et al., 2015; Gøtzsche-Astrup, 2018; Silke et al., 2021; Sklad et al., 2020). It is possible to raise awareness of different identities held by an individual for example by reminding them of their belonging to different groups (e.g., American citizens, humans in general, husband, father, wife, mother, colleague) beyond the in-group they perceive to be dominant or exclusive (van Bavel & Pereira, 2018). While a study on terrorist detainees' alternative identities did not find diminished significance of the ideology, the method nevertheless contributed to reducing the support for violent actions (Milla et al., 2020). Furthermore, Trip et al. (2019) described an approach relying on psychotherapeutic work to be more confident in dealing with uncertainties and decrease perceived threat and anxiety associated with uncertainties: Rational emotive behavioral education (REBE). REBE teaches mental health skills to deal with negative life events, which can help to perceive ambiguous situations as less threatening and

more manageable (Trip et al., 2019). Other elements from psychotherapy such as examination of one's own assumptions through so called "reality checks" (Faßbinder et al., 2015) could be successful to reduce uncertainties as well. This technique might be especially suited for application against specific conspiracy beliefs if the article portfolio provided by the app touches upon such issues.

Drawing on the findings from previous studies on critical thinking skills, tolerance of ambiguity can be strengthened through similar approaches. Furthermore, the app can be used as a starting point for the promotion of self-acceptance and the strengthening of non-extremist identities which might be useful to facilitate disengagement (Barrelle, 2015; Milla et al., 2020). The topics chosen by the client out of the news portfolio from the app can form the basis to engage in discussion and reflection of perceptions of uncertainties.

Perspective taking and empathy

The universal desire to join a social group stems from the need for belonging (Baumeister et al., 2007; Harris et al., 2014). Psychological processes such as polarized group-thinking can lead to stereotyping, devaluation, and even dehumanization of the out-group (Harris et al., 2014). However, it is possible to dismantle stereotypes by promoting perspective taking as well as strengthening empathy (Feddes et al., 2015; Lantian et al., 2021; Pelletier & Drozda-Senkowska, 2020; Pettigrew & Tropp, 2008; Sklad et al., 2020). In addition, perspective taking motivates individuals to forgive others that are initially perceived as a threat and supports the development of positive attitudes towards them (Noor & Halabi, 2018). Some prevention programs against radicalization on the primary and secondary levels deploy dialogue trainings and discussions reflecting different standpoints as tools for promoting perspective taking (Feddes et al., 2015; Schulten et al., 2020; Sklad et al., 2020).

Research on perspective taking has found effects similar to Muluk et al. (2020) regarding critical thinking interventions. Noor and Halabi (2018) conclude that successful perspective taking does not only consist of cognitive perspective taking but also understanding involved emotions. This includes sympathizing with emotions of others but also reflecting on one's own feelings in a similar situation (Noor & Halabi, 2018). Imagining another's perspective as well as imagining-self, i.e., imagining how one would feel in a

certain situation, enhances empathy (Uhl-Haedicke et al., 2019). Empathy, in turn, can also promote cognitive complexity and contributes to preventing radicalization and reducing interethnic (i.e., out-group) tensions (Savage & Fearon, 2021). Despite these expected positive effects of perspective taking, research by Berndsen et al. (2018) raises a concern that needs to be considered when trying to promote perspective taking to ultimately achieve cognitive changes. In two studies, prejudiced individuals (glorifiers of the national in-group) were instructed to take over the perspective of asylum seekers. When asked to do so, the compliance of the participants to follow the instructions reduced and participants showed reactance by refusing to take on another perspective because they felt threatened by the out-group. Stronger identification with the in-group made reactions of reactance even more likely (Berndsen et al., 2018). According to Cherney et al. (2021) issues of reactance, i.e., resistance to persuasion (see also Braddock, 2019), could hinder disengagement processes in general as individuals become less susceptible to alternate, non-violent worldviews (Cherney et al, 2021).

In contrast to Berndsen et al. (2018) Steindl and Jonas (2012) found that perspective taking was able to decrease reactance. These seemingly contradicting findings suggest that it is crucial to get individuals motivated before asking them to engage in different perspectives. Studies on counter narratives in P/CVE work offer some insights into the mechanisms that could allow more open-mindedness and reduce reactance. Schmitt et al. (2021) found in a German sample that willingness to listen to different arguments and evaluate one's beliefs increased, if narratives on a controversial topic included both an opinion close to own worldviews as well as a counter-narrative. Allowing space for own opinions seems to reduce perceived threat to own worldviews (Schmitt et al., 2021), and generates less need to defend own positions (Cohen et al., 2015).

Based on the described findings, the use of the app in combination with measures to practice perspective taking, can help raising awareness that opinions are not only one-sided or exclusive but rather part of a broad range of different but equally valid and legitimate perspectives. Especially when topics are discussed on which the client holds a strong opinion, counsellors are advised to encourage the client to change perspective. However, exercises on

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perspective taking should be carefully implemented and the client should receive the opportunity to also reflect on his personal opinions and perceptions.

Media literacy

An app-based and news-focused intervention tool naturally opens the possibility to explore aspects of media literacy. As Pennycook et al. (2021) have pointed out, even small scale interventions in this regard can help to improve careless online behavior. Experiments on sharing misinformation via social media revealed that increasing awareness of the contents' accuracy improved the quality of the news that were shared online (Pennycook et al., 2021). Media literacy interventions are often implemented on primary or secondary levels to prevent (further) radicalization (Jerome & Elwick, 2016; McNicol, 2016; Schmitt et al., 2018; Setyo et al., 2020). Jerome and Elwick (2016) additionally recommend methods of debiasing by explaining present biases in media perception through the use of examples. Additionally, explaining strategies of extremist groups to recruit and communicate (e.g., through offering easy black-and-white solutions) can also improve media literacy.

Schmitt et al. (2018) define three levels of media literacy in the context of radicalization prevention. First, analyzing propaganda material can raise awareness on radical contents. The authors advocate for a peer-to-peer approach to discuss the contents of propaganda videos to retrace how recruitment works. Second, reflection on the content is necessary as well to be able to understand one's own media usage. To increase such reflection processes, the authors suggest education on the internet and its mechanisms (e.g., algorithms). Finally, the third step entails empowerment to participate in online discussions. It is important to note that these steps apparently have different levels of difficulty in their practical application and impact, since an evaluation of such a program with students showed that they encountered problems especially with the third and last step (Schmitt et al., 2018). Besides improving knowledge on media, access to a broad and diverse media repertoire can help to protect against polarization (Dubois & Blank, 2018).

As was explained previously, debiasing can help to promote deradicalization (Bou Khalil & Richa, 2018; Pelletier & Drozda-Senkowska, 2020). Reducing biases in connection to media literacy as described by Jerome and Elwick (2016) could therefore also produce

positive effects for deradicalization work. Providing knowledge on algorithms and functionality could also help individuals to understand filter bubbles. Furthermore, the app can be a first step to familiarizing clients with different news outlets as well as confronting them with views diverging from their own, i.e., helping to overcome echo chambers. Therefore, working on media literacy can offer an additional pathway besides discussion to strengthen critical thinking. Critical thinking and confrontation with diverse media content might also promote falsification of specific conspiracy beliefs that relate to a seemingly synchronized and one-dimensional "mainstream" media. However, van Eerten et al. (2017) point out that backfiring effects need to be avoided during such confrontation, for example the intensifying of the original attitudes because mechanisms of dissonance reduction are activated and different arguments are rejected to maintain identity cohesion. As Koehler and Fiebig (2019) highlight, it is therefore necessary to train program staff carefully so that such backfiring effects can be avoided. For example, drawing on elements of Motivational Interviewing (MI) can be beneficial to achieve positive change (Clark, 2019). MI includes "establishing an empathic and collaborative relationship" (Clark, 2019, p. 51), which means treating a client with respect even if one does not endorse their opinion (Clark, 2019). This trust-based relationship is a general pre-requisite for successful disengagement work (Koehler, 2017b) and facilitates amplification of potential discrepancies a client already has and helps them to open up more effectively (Clark, 2019). Leaving enough room for the client's own opinions as described above also reflects the recommendations made to decrease reactance (Cohen et al., 2015; Schmitt et al., 2021).

Conclusions

Deradicalization work is ideally based on the individual needs of the client to facilitate detachment from extremist milieus. Multiple different methods and approaches are used in this field, ranging from labor market reintegration to more psychologically focused tools (Allroggen et al., 2020; Costa et al., 2021; Koehler, 2017b). Since extremist worldviews are often accompanied and influenced by a lack of tolerance of ambiguity, perspective taking, or critical thinking, as well as further increased by online filter bubbles and echo chambers, a

deradicalization and disengagement program in Baden-Wurttemberg, Germany, is field testing a new intervention method in an attempt to directly increase cognitive competencies by implementing an app into the counselling work. This article has outlined the theoretical foundations for this intervention tool's application as well as the envisioned effects it ideally might yield. Figure 1 summarizes the implementation of the app although the presented aspects are not exhaustive. The app offers the possibility to draw on different methods. This toolbox consists among others of discussion but also role-playing or story-telling. Implementation always depends on the client's willingness to participate and try out certain methods and needs to consider potential counterproductive mechanisms such as reactance. Direct outcomes can be categorized into four mechanisms although as laid out above they can influence each other and are also able to influence further mechanisms.
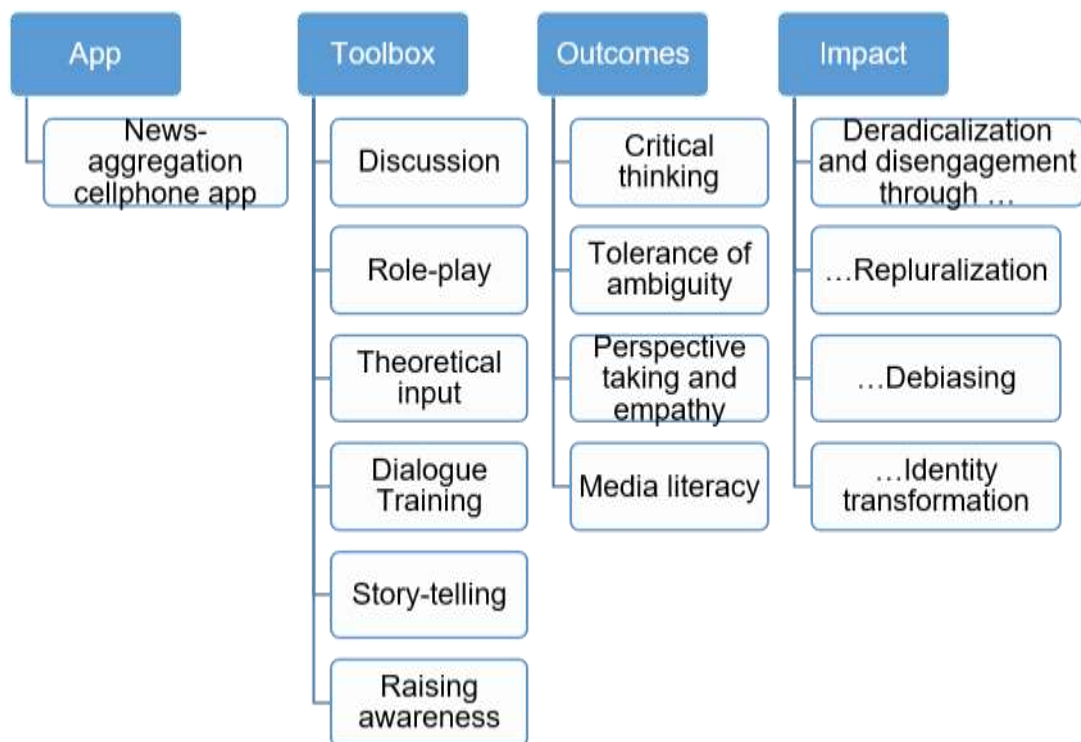

Figure 1. Implementation and expected outcomes

Theoretically, the app in combination with further tools can increase critical thinking skills, tolerance of ambiguity, perspective taking, and empathy. Improving these aspects also

facilitates the reduction of uncertainties and addresses extremist black-and-white thinking as well as related issues such as conspiracy beliefs by. Furthermore, media literacy to improve knowledge on online recruitment and radicalizing mechanisms such as filter bubbles and echo chambers can be addressed through the utilization of the tool. The advantage of the app-usage is that it can be tailored to the individual client, for example if the person has greater need for strengthening tolerance of ambiguity but reports sufficient understanding of media literacy. This flexibility is also reflected in the ways the intervention can be integrated into the counselling work, since the available prior literature provides several evidence-based recommendations for its implementation.

While these outcomes are easier to observe, they are expected to contribute to the overall impact, i.e. deradicalization and disengagement through repluralization, identity transformation, and debiasing. As described earlier the app is only one method among others that aim to contribute to the impact. The app is insofar a valuable addition as it offers a concrete tool to tackle related issues.

When considering certain methods from the toolbox, the counselling work typically offers opportunities for discussion, which ideally include critical positioning and reflection on the chosen topics. Counselors should actively prompt clients to change or switch cognitive as well as emotional perspectives as this was found to increase perspective taking more successfully (e.g., Noor & Halabi, 2018). When engaging in discussions and exercises of perspective taking, however, negative reactions to the challenging of own views such as reactance or backfiring effects need to be anticipated. It is therefore advisable to apply the app only when a certain level of trust has been reached and to always allow room for reflection of the client's own worldviews (Clark, 2019; Cohen et al., 2015; Schmitt et al., 2021). The app can also be utilized to provide knowledge on cognitive biases in regard to thinking and perception processes. Furthermore, creative approaches such as storytelling or role-playing are worth including as well if the client is open to such methods. Based on the topics discussed between client and counsellor, it is also possible to raise self-awareness and self-acceptance to strengthen identity and self-worth. Over time, the client can also use the app independent of the intervention to further broaden his or her perspective.

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There are also limitations of this tool's application in deradicalization work. Some issues arise in regard to the theory of change. As mentioned above, cognitive dissonance and reactance could hinder positive effects of the app but can be met with trust and openness towards the individual. A more pressing issue is the difficulty to judge the impact of the program as a whole and the specific usage of the app on the deradicalization and disengagement processes. Apart from general issues that arise from evaluating deradicalization and disengagement programs (e.g., lack of consensus regarding markers for success, Feddes & Gallucci, 2015), it is especially difficult to trace potential impact back to the usage of the app which is part of multiple needs-based methods. As Klöckner et al. (2021) state multicollinearity of factors hardly allows to draw conclusions on single methods. Rather than measuring overall impact, however, a solution is to assess specific outcomes (Klöckner et al., 2021). The expected outcomes discussed in this paper help to break down the potential effect for future evaluation.

Another limitation relates to the examined literature that acts as the basis to the proposed mechanisms. A great number of evaluations – some of which were cited in this paper – in the field of radicalization prevention do not provide long-term data to draw conclusions on the stability of effects (e.g., Jugl et al., 2021; Lösel et al, 2021). While Feddes et al. (2015) found some tentative evidence that empathy was still increased even after the assessed intervention and still predicted less violent intentions, the long term stability of methods to strengthen such competencies is unknown.

Further limitations of the application relate to specific challenges of deradicalization work. The konex program currently field testing the app targets members of different types of extremist milieus. Especially in the context of Islamist extremism but also non-religious foreign extremism (such as the PKK), language barriers make the use of a German app difficult. This also entails that application of the app is currently not possible in non-German speaking states. Additionally, clients from different countries could rather be interested in issues and debates relevant in their own country in contrast to the topics presented in the app that often focus on Germany or the broader international context. Furthermore, application is limited or impossible for example, when the client is imprisoned or does not have access to a web-enabled device. Alternatively, the counsellors could print the different articles to work on

a certain topic. However, the client would not benefit from using the app on his own. Therefore, the app seems best suited for individuals who are currently not imprisoned. An additional limitation is the multi-faceted nature of the disengagement and deradicalization process. This intervention method should be seen as only one approach among different tools. Nevertheless, the present article lays a theoretical foundation for how and why this type of intervention might be effective. Still, as Lub (2013) puts it: "(…) what works in theory does not always correspond with what works in practice" (Lub, 2013, p. 176). Hence, in the following phase of the field test of the app, its implementation and potential outcomes will be evaluated.

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