

Measuring executive and underlying cognitive functions in schoolchildren in Ukraine

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Valorization

The first aim of this dissertation was to contribute to scientific knowledge concerning norms for several tests measuring cognition and more specifically executive functions in a non-Western (Ukrainian) sample of schoolchildren. The second aim was to investigate perceptions of Ukrainian adolescents and their families, community and society about health in general and more specifically alcohol (mis)use. The significance of the findings for future studies and interventions has been described in the previous chapters. This valorization section aims to describe the social and practical value and relevance of the findings in this dissertation project for individuals, communities, and/or organizations (e.g., children, parents, schools, school psychologists) outside the scientific community.

Relevance

Executive functions (EFs) is an umbrella term used for a set of interdependent cognitive skills that support decision-making, problem solving, and planning, which all require cognitive flexibility (Anderson, 2002). These skills have been shown to support beneficial outcomes in daily activities, e.g., obtaining and keeping jobs (Duncan et al., 2007; Parsons & Bynner, 1997). The development of EFs takes up until (at least) young adulthood and the level of developmental end state of functioning differs per person (Luciana et al., 2005). Indeed, EFs are rather sensitive to disadvantageous developmental factors such as, among others, lower socio-economic status and stressful life events (Bos et al., 2009). Thus it is important to monitor development of EFs in schoolchildren, particularly those considered to be ‘at risk’, and to identify challenges (Luciana et al., 2005; Luciana & Nelson, 1998).

We therefore measured multiple EFs in Ukrainian schoolchildren (5.10 to 14.5 years old, reported in the chapters 2 – 4) and established a suitable and culturally appropriate norm. Cognitive functions and specifically EFs have been associated with knowledge, values and beliefs, which differ per culture and social context (Ardila, 2005; Lezak, Howieson, Bigler, & Tranel, 2012). Ukraine, with its complex history (e.g., geopolitical changes affecting among others economic factors such as work opportunities) may share cultural characteristics with other Slavic and/or former USSR countries (D'anieri, 2018; Berlach, Kulyk, & Losych, 2019; Lekhan, Rudi, & Richardson, 2010; Kubicek, 2002; Subtelny, 2009). The norms established for these EFs tests in this study, included several demographic variables to reflect the sample’s characteristics, and are therefore appropriate for these Ukrainian schoolchildren as opposed to the existing Western norm (De Luca et al., 2003; Lehto, Juujärvi, Kooistra, & Pulkkinen, 2003; Luciana & Nelson, 2002). This information is relevant for varying communities to provide the normal range for developmental areas (e.g., EFs) or measurement tools (e.g., tests and their accompanying norms), that are currently still mainly reported based on Western data. Having appropriate norms against which to compare children’s performance may enable

early intervention if (extreme) deviations from these norms are found. Furthermore, the method of norming described in chapters 2 – 4, supports the replication and application of these tests in other samples, as well as for different tests or measurement tools with the aim to increase suitable evaluation of children's scores.

The relevance of the second aim of this dissertation relates to a holistic developmental view on early childhood (Bronfenbrenner, 1994). Bronfenbrenner and Morris (2006) posed that child development needs to be seen in its context; well-being is not only related to individual characteristics but also to the environment (e.g., interpersonal variables, society and culture). Translating this general holistic view to the Ukrainian sample: Teachers had expressed concerns about the availability of alcohol to young people and their potential alcohol consumption, as well as possible alcohol (mis)use in families. Therefore, we focused on children's developmental context by investigating the perceptions about health (and alcohol) from different stakeholder perspectives and the viewpoints of varying age groups in the second part of this dissertation (chapters 5 – 6). This is relevant as it provides qualitative support for figures presented by e.g., the WHO (2018). Risky alcohol use worldwide has been identified as a priority and Ukraine scores in the highest category of the so-called 'years of life lost' (WHO, 2018). Indeed, our findings reflected the country's complex history, economic challenges as well as cultural traditions of a Mediterranean pattern of alcohol consumption with family meals and norms related to hospitality (in line with e.g., Popova et al., 2007). Furthermore alcohol use was discussed by both adults and youth in the context of social norms and coping mechanisms. The qualitative data presented here, therefore point toward and refine specific needs of different groups within Ukrainian culture, and they inform the feasibility of policies aimed at e.g., reducing the production and sales of home-brewed alcohol.

The findings reported in chapter 6 are relevant in relation to the prevention of public stigma, which was reported to exist in people suffering from AD and their families (Bos et al., 2013). Knowledge on stigma and the particular forms of stigma is relevant since a wide range of structural measures and interventions are needed to address these harmful beliefs in society and organizations (Bos et al., 2013; Hatzenbuehler et al., 2013). Further, fear of being stigmatized has been identified as an important barrier to seeking help and therefore interventions need to focus on reducing this barrier at the individual level and increasing feelings of self-efficacy and coping strategies (Bartholomew-Eldridge et al., 2016; Schomerus et al., 2010).

Target groups

The knowledge and data generated with the studies in this dissertation may be of interest to a wide-ranging audience.

Educational professionals (psychologists, social workers) working with children adolescents may gain better insight in potential levels and trajectories of EFs development by administering the EF tests described in this thesis. Establishing Ukrainian norms for valid EFs tests as well as a comparison to Western norms allows application in real-life

settings for the sample. For example, these norms can be used for appraisal of individual performance and may help to inform long-term goals such as starting to monitor EF development. These norm calculations furthermore provide a starting point for more objective evaluations of classes, year groups, schools and individual children, compared to e.g., teacher observations. Professional decision-making includes referral to secondary schools and further education. Objectively obtained reports on skills (e.g., EFs) may provide more reliable tools to inform choices about suitable further academic development.

Organizations publishing (established) norms and populations that differ from generally established test norms may gain from the refined knowledge on creating norm data in schoolchildren as we presented in this dissertation. The regression-based methods described extensively in Chapters 2 – 4 are a rigorous and evidence based approach to norming, resulting in more appropriate standards for populations other than possibly established for current tests. This norming procedure might be applied to varying populations that ‘differ’ from existing norms. Existing test norms may incorporate a limited amount of demographic variables, and thus be limited in the standard against which an EF test score is compared. This means that both characteristics of the norms (e.g., only including one demographic variable such as age) as well as (sub)populations may be in need of more suitable norms. To say it differently, a well-established Western norm for valid measurement tools may be limited in its suitability due to the limitations in the method of calculating norms. As such, this study may be of relevance to organizations providing normed tests. Apart from these established norm samples, populations that have not been included in norm calculations for valid EF tests, such as the non-Western schoolchildren in this dissertation, may also benefit from applying the methods described in detail.

Parents and caregivers may gain insight in their child’s development through scores on EFs, which are compared against an appropriate norm for their child. Parents, especially in stressful life situations (e.g., lower socio-economic status, or suffering from alcohol misuse in the family) may benefit from seeing results of validated EFs measurement compared against suitable norms. A developmental message about a general cognitive skill of their child (e.g., the EF of short-term/working memory) may provide the chance for a constructive discussion about their child’s needs and well-being as opposed to an attainment score on a general knowledge test. As such parents may be supported in their self-determination to raise their children (e.g., knowing and understanding when to ask for help).

Target groups for the second aim of this dissertation overlap with the ones mentioned above, yet also include wider parts of communities and society. For example, stigma concerns society and implicates measures at the societal level. Yet, the current research also indicated that stigmatizing perceptions of individuals exist at lower, organizational levels. Provider stigma was reported in relation to health care, but also female versus male patients was. Thus the availability of care (e.g., health insurance accessible for all) as well as underlying beliefs of some professionals could be targets of intervention (Angermeyer et al., 2013). Well-meaning respect for privacy may suggest a

barrier to health care, which needs further research. Equally, this example demonstrates that varying forms of stigma need to be understood thoroughly within the applicable groups, including the perceptions, attitudes and underlying beliefs (i.e., the mechanisms). Although clear areas in need of intervention emerged, more specific needs assessments are required first.

Another area where organizational level interventions may merge with interpersonal and personal levels could concern schools. Worldwide, a range of issues in primary and middle schools (such as risk for the initiation or continuation of substance use, academic failure, peer pressure, and mental health problems (Eaton et al., 2008) have become the focus of prevention. Those efforts target holistic development of children, and aim to teach that taking care of one's mental health is equally normal to taking care of one's physical well-being. The reported qualitative data in this dissertation showed that about half of young people made future oriented choices, e.g., not consuming alcohol, and prioritizing studying to gain access to secondary education. However, roughly the other half of this sample appears in need of support which could be provided through adapting and implementing social-emotional learning (SEL) curricula (see e.g., Durlak et al., 2011). Such SEL programs are effective in increasing youth's emotion recognition, stress management, empathy, problem-solving and decision-making skills (Durlak et al., 2011).

Activities and products

This dissertation will be disseminated to school organizations, teachers, community leaders, individuals, and translators. Scientific articles resulting from the chapters of this dissertation have been and will be published full open access, allowing a wide audience to access the findings. Local discussions will be initiated and facilitated by the author of this dissertation, to connect people and share knowledge and experiences. These discussions will mainly take place electronically given large distances. We will ensure that the different geographical regions are contacted, thus creating the possibility for grass root effects.

Further research in evidence-based approaches that target the identified areas of interventions will be undertaken (e.g., motivational interviewing). Some community leaders had already proposed community based group activities in order to start talking about life's challenges and feelings. Motivational Interviewing (MI) appears especially appropriate in the ever-changing economic-political situation and uncertainty. One of the core elements concerns discussing ambiguity toward behavioral change, which is a general challenge for humans but may be a particular issue in demanding situations. Last, MI has been shown to reduce barriers to seeking help. Ultimately, the findings from this dissertation as well as the community group meetings could result in a trainer's guide to facilitate such discussions.

Innovation

This study is innovative in its combination of both interdisciplinary research and mixed methods. First, taking both neuropsychological development as well as social (health) psychology into account has resulted in a more holistic view on children's cognitive development. Second, combining quantitative and qualitative research methods supported a richer description of cognitive functions and environmental variables. Conducting the research in itself evoked questions and discussions with the target group(s): Teachers asked what tests entailed and how that related to learning and development of children. Discussions about differences in cultures between participants and researchers moved away from general educational complaints toward collegial consultation. The qualitative data provided participants a platform to share their stories and additionally, it appeared that some started to reflect, which may be a possible next step in individual processes to change behavior or engage in community (prevention) activities. Last, EFs have been implicated in a range of topics related to development, cognition, health and well-being (Eisenburg et al., 2019). Curricular adaptations relating to mental health and holistic development, activities such as developing self-efficacy and coping skills for practical life situations, have been identified in other countries as beneficial to children's health and general development. This study provides additional ideas how to incorporate unique social and cultural characteristics of a population in such curricula targeting general mental health.

Implementation

To disseminate our findings among organizations publishing (established) norms and populations that differ from generally established test norms, we will seek further publication and continue to draw attention to the dissemination that has already taken place (conference presentations and open access publications) on professional social media (e.g., LinkedIn). Importantly, plans to develop a trainer's guide to facilitate motivational interviewing in culturally and socially appropriate manners are being developed. Last, dissemination to different stakeholders mentioned above has started electronically.