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"Impulsivity predicts dogmatism, but less so for those with ADHD - an exploration of the impact of neurodivergence on an ideological outcome "

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Abstract[1]

This thesis explores the impact of attention deficit hyperactivity disorder (ADHD) on dogmatism, motivated by the growing recognition of neurodiversity and specific interest in ADHD. It connects recent ADHD research and the study of the cognitive basis of ideological thinking to justify examining ADHD's influence on dogmatism, with a focus on impulsivity as a key trait. ADHD's neuro-cognitive traits are positioned to influence ideological beliefs, looked into via diagnosis status, a combined primary presentation of impulsive, hyperactive and inattentive symptoms compared to non-ADHD controls. Within those with indication of ADHD diagnosis medication status is also explored in its potential effect on dogmatism levels. To approach this, an online survey (n=199) targeting adults to assess the relationship between ADHD symptoms, impulsivity, and dogmatism, was employed, using tools such as the Conners' Adult ADHD Rating Scales and Altemeyer's dogmatism measure. Findings indicate that ADHD diagnosis and symptom presentation *per se* do not significantly alter dogmatic attitudes, but medication use has a slight positive impact on dogmatic attitude, suggesting further research into medication's role is needed. Surprisingly, male gender correlated with higher dogmatism, diverging from existing dogmatism research, indicating no effect of gender on dogmatic attitude. The thesis is concluded by suggesting future studies focus on ADHD's potential positive traits, like creativity, to better understand its effect on dogmatic thinking. Finally, upon reflection of sample limitations, it calls for more diverse samples to improve research generalizability and insights.

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[1] German abstract given in appendix.

Introduction

Recent theoretical developments in both research on attention deficit hyperactivity disorder (ADHD) and findings on the cognitive antecedents of ideological thinking justify the initiation of an investigation into the potential effect of ADHD on dogmatism via the identification of certain shared correlates.

These concepts will be introduced in more depth below. First, it is worth acknowledging that awareness around neurodiversity, particularly ADHD, has experienced an independent increase in attention from the public eye. A surge of video content on social media platforms, TikTok in particular, has given rise to a group of creators, bloggers, and influencers with and for audiences with ADHD. Their presence is also reflective of a more generally elevated level of awareness, which engendered a rise of diagnosis rates and requests for testing (and similarly elevated waiting list times) not least among girls, women, or adults. Such previously overlooked populations in ADHD research/testing are also becoming increasingly reflected in the literature (e.g., Henry & Jones, 2011; Hinshaw et al., 2022; Quinn & Madhoo, 2014). In parallel, a potential-benefit-oriented perspective on neural atypicality, which includes framing it as an (evolutionary) necessity (e.g., Bradshaw & Sheppard, 2000) or context-dependent strength (e.g., Colzato et al., 2022), can be argued, which also touches on perceptions of other potential strengths, such as a/the creative potential in ADHD (e.g., Boot et al., 2020; Hoogman et al., 2020).

At the same time, current and more longstanding political, religious, and social affairs across countries (e.g., Bourchier, 2019; Falkenberg et al., 2022; Silver, n.d.) have emboldened the drive to understand the psychological factors that make people maintain or question ideological belief systems, whereby ideology pertains to the inherent characteristic of cognitive processes essential for the dissemination and actualization of individual and societal level beliefs (see e.g.,

Nescolarde-Selva et al., 2017). This research, through interlacing cognitive psychology, (computational) neuroscience and social sciences, has sprouted new theories on factors which contribute to people being vulnerable to ideological attitudes, other than their motivations and situation-specific factors. In recent years, research in this field has begun to emphasize the need to connect variations in perception and cognition among individuals with differences in ideological thinking, to take the significant influence of cognitive information-processing styles and emotional processing on ideological thinking into account. Looking at theoretical work on the topic, for example, Leor Zmigrod's proposal of a neurological model for ideology (Zmigrod, 2020) in particular, it can be noted that if ideological outcomes were really influenced by cognitive characteristics, this notion should also (and perhaps especially) be true for individuals whose cognitive profiles are extraordinarily characterized to begin with and further; if such individuals show elevation of known predictors to ideological outcomes in their cognitive and personality profiles, will they result in an elevated ideological attitude?

This paper thus attempts to connect traits arising from differences in neuro-cognitive processing of a neuro-developmental disorder which can be observed and tested, and thus might affect purported interactions with ideology and its outcomes. More specifically, this work aims to take the question of which cognitive factors might influence ideological outcomes and apply it to adults with ADHD. Before delving into previous research, the explication of formalism and concepts, established in previous literature, will provide a useful framework.

Recent theorizing in ideology research

Ideology can be deeply ingrained into our thinking and thus influence a wide range of societal, cultural, and political practices, in turn shaping how individuals view and engage with issues such as social justice, environmentalism, political systems, and economic structures. Public

discourse and political debates in recent years have shown the widespread need to continue to inquire into the role of ideology in shaping individuals' beliefs and actions, to affect real world changes more effectively or to simply gain a more grounded understanding of underlying mechanisms.

After decades of research into ideology, however, its definition is still under construction. This is not least thanks to a high diversity of perspectives from political theory, sociology, and psychology. Zmigrod (2022) asserts that research into ideology has primarily focused on exploring the reasoning behind and content of ideological beliefs. Yet, this approach has led to a lack of cohesion in concepts and an absence of comprehensive investigations into the structure of ideological thought across domains. The fundamental questions are: Why is ideological thinking - regardless of its political, religious, environmental, or other contents - so pervasive? What processes can guide our affinity for ideological thought? Cognitive and neuroscientists have sought to identify structural commonalities among psychological processes of individuals with elevated levels of ideologically driven tendencies rather than focusing solely on theoretical factors associated with these leanings. By taking this approach, an interdisciplinary understanding regarding the psychological foundations underlying ideological thinking can be developed, which will also be elaborated in the next section.

Definition of terms: Ideological Thinking

Ideological thinking, especially, can be understood to be more precise than a set of beliefs, values, and attitudes that shape an individual´s or group's understanding of the world around them, as well as their behaviors and actions within it (see e.g., Converse, 2006; Malešević, 2011). Zmigrod (2022) has argued that two common denominators can be identified across (even theoretically opposing) ideological belief systems that aid the inoculation of believers and their

galvanization to collective action and sacrifice (Hoffer, 2010): the *doctrinal* component and the *relational* component.

The *doctrinal* component involves the embrace of a rigid dogma, which leads to the adoption of an absolutist description of the present and past, as well as a set of prescriptions for future thought and behavior. This means that individuals who adhere to a particular ideology may view their beliefs as absolute truths and may be resistant to taking alternative perspectives or trusting evidence that contradicts their worldview. The *relational* component, on the other hand, involves identity demarcation and differential treatment of doctrine adherents. That is, individuals who adhere to a particular ideology may identify strongly with their group and may view those outside of their group with suspicion or hostility. They may also exhibit in-group favoritism towards fellow adherents, while displaying distrust or prejudice towards non-adherents.

It is worth noting that these two components are intertwined, but by breaking down ideological thinking into subcomponents, researchers can gain a better understanding of how belief systems shape human action and behavior and how ideologies overall engender rigid and dogmatic attitudes concerning morals, identity, and truth (Zmigrod, 2022a). While the dogmatic component is the main focus of this study (as well as of the primary utilized measure), it can be argued that the choice of operationalization can allow inferences not just about potential elevation in dogmatism, but it also – since it includes notions of out-group hostility – gives insight (albeit to a more limited degree) on outcomes concerning overall ideological thought.

Specifically, I intend to test how ideological thinking, particularly dogmatism, is related to or characterized by the expression of symptoms in ADHD, a neuro-developmental disorder, known to affect neurocognitive processing (Alqahtani et al., 2019; Mohamed et al., 2021; Schulze et al., 2020) and thereby the expression of associated traits and symptoms which are shown to heighten

vulnerability to ideological attitudes. To strengthen this argument, it is helpful to review some key characteristics of ADHD first.

Definition of terms: ADHD

ADHD is one of the most frequent psychological disorders in childhood, with international epidemiological studies documenting a prevalence of 5.3% and little variability between countries (Faraone et al., 2015; G. V. Polanczyk et al., 2014; G. Polanczyk et al., 2007) and it can persist into adulthood, with study results showing a prevalence of 2.5% (Simon (Simon et al., 2009). Put differently, about 50-80% of those having ADHD as children, still show symptoms as adults. A third of adult patients show the full cluster of symptoms(Biederman et al., 2000).

At any age, the disorder is characterized by three main symptoms pertaining to inattention and/or impulsivity and hyperactivity, as defined by both the 11th edition of the international statistical classification of diseases and related health problems (ICD-11; World Health Organization, 2019) and the fifth edition of the Diagnostic and Statistical Manual of Mental Disorders, (DSM-5-TR; American Psychiatric Association [APA], 2022). The latter offers classification into three presentations (a replacement term for "subtypes" to reflect changes over time): predominantly inattentive type (ADHD-I), predominantly hyperactive-impulsive type (ADHD-H), and combined type (ADHD-C). ADHD-I and ADHD-C presentations are most frequently identified among adults, as suggested by studies involving large samples ($n > 100$), putting prevalence rates at 56–62% for ADHD-C, 31–37% for ADHD-I, and at 2–7% for ADHD-H (Millstein et al., 1997; Wilens et al., 2009). A more nuanced presentation of symptoms in adulthood is also reflected in the recently adapted symptom descriptions for adult ADHD by the DSM-5-TR (APA, 2022). The symptom descriptions now include criteria such as disorganization, forgetfulness or distractibility when performing tasks requiring sustained attention. These changes

make the criteria for diagnosis of adult ADHD more distinct from those used to diagnose children and highlight the importance of age-specific measures when assessing symptoms. Hyperactivity tends to be not as prevalent in adults across subtypes (Ayano et al., 2023; Salvi et al., 2019; Wilens et al., 2009) compared to children and adolescents with ADHD. Moreover, impulsivity and inattention, though distinguishable, are found to be highly correlated (Willcutt, 2012). There is a "causal path from inattention to hyperactivity/impulsivity," insofar that clinical interventions targeted at the former will likely affect the latter, but not the other way around (Sokolova et al., 2016). This might then mean that subtype differences, as defined by the DSM-5-TR (APA, 2022), in relation to how strongly they exhibit impulsivity/hyperactivity, should be considered as a potential aspect for differentiation. They may confound comparisons between ADHD and control groups such that failures to show differences are most likely when ADHD subtypes differ by a lot, and thus interfere with the distinction of ADHD adults from controls (e.g., in neuropsychological testing, see Dobson-Patterson et al., 2016).

Overall, developmental stage and gender do also affect presentation of symptoms, thus should be accounted for when looking at their effects on outcomes of interest. For instance, a common observation is constituted in a shift towards internalized rather than externalized representation of hyperactivity, that is feelings of restlessness, fidgeting or racing thoughts instead of outward hyperactivity, when observing girls and women (e.g., Young et al., 2020; Hinshaw et al., 2022; Quinn & Madhoo, 2014). Furthermore, gender differences in prevalence have been consistently reported, with males being more commonly affected by the disorder than females (Faraone et al., 2021). Considering the impact of the developmental stage and gender on symptom expression, it is important to use age- and gender-specific measures when assessing ADHD symptoms.

In general, quality of life can be heavily reduced by having ADHD, with widespread consequences for educational, professional, and psychosocial contexts (Faraone et al., 2015). Societal costs are estimated to be around billions of dollars each year in the US, with a substantial portion being attributed to indirect costs such as reduced productivity and increased rates of unemployment (Birnbaum et al., 2005). Individuals with ADHD also often experience comorbid mental health conditions that further reduce their quality of life. These comorbidities include but are not limited to anxiety disorders, depression, substance use disorders, and sleep disorders (e.g., Biederman, 2004; Gnanavel et al., 2019). Comorbidities significantly challenge the accurate diagnosis and effective treatment of ADHD, can exacerbate symptoms, and lead to poorer outcomes (Katzman et al., 2017). Furthermore, research suggests that some comorbidities may be more prevalent in specific subgroups of individuals with ADHD, such as anxiety disorders in those with predominantly inattentive subtype (İPÇİ et al., 2020). Given the significant impact of comorbidities on ADHD, it is important for clinicians as well as researchers to assess and address their presence in individuals with the disorder. This can be achieved by incorporating relevant screening tools and assessments for comorbidities alongside ADHD assessments.

Finally, while recommended treatment for ADHD is multimodal (e.g., Wender et al., 2001), in practice, often medicinal treatment only, with stimulant medication as the first line of defense, is used to reduce core symptoms, including impulsivity, for children and adults with ADHD (Boland et al., 2020). Therefore, in addition to the main purpose of my study, I also conduct explorative analyses to examine whether the ADHD subgroup differs in outcomes due to medication status or subtypes.

Concluding the elaboration of terms, it is perhaps not immediately obvious to associate individuals with ADHD with being particularly vulnerable to or otherwise conspicuous in their

ideological views; however, considering recent theoretical developments in both ADHD research and findings on the cognitive antecedents of ideological thinking, it is justifiable to initiate investigation into the potential effect of ADHD on dogmatism via the identification of certain shared correlates. Before I argue on the relevance of impulsiveness as both a main characteristic of ADHD and a predictor of dogmatism, it is helpful to consider the reason why it makes sense to investigate ideological outcomes in individuals with a divergent cognitive processing in the first place. An emerging science indicates that ideology may be understood in terms of neurocognitive principles, which both integrate situational and influence motivational factors, thus dynamically contribute to ideological attitudes.

The neurocognitive model of ideology

The neurocognitive model of ideological thinking (Zmigrod L & Zmigrod, 2020) builds on evidence that human cognition is governed by neural systems that evolved to sense and make sense of the physical world on a very fundamental level (Posner & Rothbart, 2018; Sallis, Smith, & Munafo, 2018; Trofimova, 2016; Trofimova & Robbins, 2016; Uher, 2018). Thus, human cognition serves as the basis for, what Zmigrod proposes as likely bidirectional interactions between the brain and ideological(-ly biased) environments, resulting in as well as influencing individuals' higher-level ideological tendencies. Just like the processing of and reaction to stimuli varies between individuals, as determined by low-level, stable, and automatic perceptual and cognitive processes (Trofimova et al., 2018), a potential relationship between cognition and ideology is inferred, with individual susceptibility to high-level ideological perspectives being drawn from those same biologically-guided action and decision-making processes (Zmigrod & Zmigrod, 2019; Rollwage et al., 2018, 2019; Zmigrod et al., 2018, 2021; Zmigrod, 2022a).

Put differently, a person's cognitive/neurological disposition is proposed to shape their vulnerability to certain ideologies. Exposure to those ideologies in turn can go on to shape their neurological systems, as both high- and low-level information processing is governed by the same brain. Ideologically motivated action then arises as a result and can thus be inferred by and illuminated through considering variable perceptual and cognitive predispositions as well as their adaptation to long- and short-term environments (Zmigrod L & Zmigrod, 2020). Since the model is agnostic to what belief system a person is partial to, it allows inferences about ideological vulnerability and susceptibility of individuals and groups with shared or at least comparable (neuro-)cognitive characteristics, across ideological content, and what it may mean for their dogmatic or interpersonally intolerant inclinations. Recurring onto the centrality of low-level perceptual processing, the implication would be that such mechanisms not only apply to neuro-typical individuals, but also - as pertinent to this study - to individuals with conditions affecting their neurological make-up, and thereby said neuro-cognitive processes.

Given the introduced model´s relatively recent formulation (2020), the basic assumptions of the model are yet to be extensively tested and the results replicated. However, assessing the model's implications through populations that are diverging in their neurological make-up and thus in the expression of relevant traits can serve as a worthwhile exploration – if certain requirements, especially justifying the assumed or likely cause in observed effects, are met. The identification of overlapping concepts is oriented around available literature on dogmatism, as its limited scope necessarily demarcates what can be identified elsewhere. Yet, a survey of both cognitive challenges and strengths in ADHD, as well as what predictors appear as relevant to ideological thinking, or more particularly dogmatism, leave at least one larger concept intact: impulsivity.

I will now therefore review previous findings showing the relevance of impulsivity, a main characteristic of ADHD, to ideological thinking/dogmatism, while also connecting it with literature on impulsivity in ADHD.

Connecting trait: Impulsivity

In their 2012 paper on 'How dogmatic beliefs harm creativity and higher-level thinking', Ambrose and Sternberg (2012, Foreword xi) note:

> One's degree and form of dogmatism may best be construed as a developmental issue. The notions of "remaining youthful" or "attaining maturity" have a range of connotations. With respect to very young people, one can imagine the child who flits from one notion to another as well as the child who is incredibly stubborn.

A mix of impulsivity, lack of emotional regulation, and distractibility in one's behavior can lead observers to apply that same label of child-like-behavior to individuals with ADHD, which is indeed a neuro-developmental condition. It is certainly interesting to consider whether that same inattentiveness and impulsivity, that might lead to jumping from one conclusion to the next, might also affect dogmatic tendencies. In other words, does the 'allure of novelty', that is a continued stream of ever new stimuli, perhaps hinder settling on a singular set of beliefs for too long?

According to the Society for Research on Impulsivity (2019 as cited in Strickland & Johnson, 2021, p. 2) impulsivity is regarded to reflect:

> Behavior without adequate thought, the tendency to act with less forethought than do most individuals of equal ability and knowledge, or a predisposition toward rapid, unplanned reactions to internal or external stimuli without regard to the negative consequences of these reactions.

Zmigrod and colleagues (Zmigrod & Zmigrod, 2019; Zmigrod et al., 2021) have mostly argued that such impulsivity represents an important personality factor in predicting dogmatism. While research on the cognitive, behavioral, and emotional basis on dogmatism is still restricted, some reoccurring concepts can be identified as relevant in predicting dogmatic ideological attitudes. For example, impulsivity and sensation seeking as an expression of impaired emotional regulation and reactivity have been posited as predictors for extreme political action (Zmigrod & Goldenberg, 2021). A data-driven analysis of dogmatism as one of three ideological signatures or factors investigated by Zmigrod and colleagues (2021) showed that demographic variables seemed not to predict dogmatism, whereas impulsivity, combined with ethical and social risk-taking did, which turned out to also represent the most parsimonious model for predicting dogmatism in the given dataset. That same study also suggests that considering both, personality and cognitive variables, makes sense when investigating dogmatism, as both impulsivity and a tendency for slowed evidence accumulation in decision-making explained variance (Zmigrod et al., 2021). The resulting resistance to belief updating is also shown by Schulz and colleagues (Schulz et al., 2020), where more dogmatic participants also were less likely to seek further information to revise opinions based on poor or unclear initial evidence because they relied less on internal cues of uncertainty/confidence. This resulted in less accurate decision-making and was consequently interpreted as an unwillingness to seek correcting knowledge or update beliefs when encountering new information – a characteristic reminiscent of the very definition for dogmatism, which is based on the strict preservation of one's views (Rokeach, 2011), regardless of their correctness (Rollwage et al., 2018). It is suggested that, rather than being an intentional strategy, such processing failures are the result of a lack in inhibitory control (Zmigrod & Goldenberg, 2021). Due to the limited amounts of studies on dogmatism, it can help to widen the scope of this excursion by also

considering results of studies on intellectual humility, the conceptual inverse of dogmatism (Zmigrod, 2022b). In the indicated study, individuals with low impulsivity and elevated levels of emotional control did show higher intellectual humility, especially concerning the facets of willingness to update beliefs considering new evidence and respectfulness towards differing beliefs held by others. In addition, willingness to update beliefs was also associated with low temporal discounting in behavioral assessments for this study. Thus, ability to delay gratification/ rewards was suggested to play a role in openness to evidence/ belief updating (Zmigrod, 2022b). In summary, impulsivity is a clear candidate predictor for dogmatic thinking and likely reflective of an impairment in inhibition and strategic decision-making due to inexact information-processing (Zmigrod et al., 2021).

It is worth highlighting, how some of the above mentioned impairments are especially featured in ADHD research (e.g., Winstanley et al., 2006), such as impaired response inhibition (e.g., Crosbie et al., 2013; Woltering et al., 2013), impairments in delayed gratification (e.g. Jackson & MacKillop, 2016; Marx et al., 2021), emotional dysregulation (Soler-Gutiérrez et al., 2023), probability discounting (i.e. risk taking; e.g., Dai et al., 2016; Dekkers et al., 2016; Pollak et al., 2019), and elevated sensation seeking (e.g., Bijlenga et al., 2017; Geissler et al., 2014; Kamath et al., 2020). All of them were positively associated with having the diagnosis.

Furthermore, other behaviors that fall under the umbrella term of "impulsivity"[2] necessarily appear in research on ADHD as well, for instance, distractibility (i.e. low resistance to distractor or proactive interference) (Gumenyuk et al., 2023; White, 2007) impaired planning (e.g., Fabio & Caprì, 2017; Young et al., 2020), as well as lack of persistence (e.g., Colzato, Hommel, et al., 2022; Gomez & Watson, 2023; Roberts et al., 2014).

Debates on definitions (e.g., for impulsivity, see Strickland, 2021) as well as overall limitation on the range on research on the cognitive basis of dogmatism notwithstanding, the literature does still allow connecting the risk factor of impulsivity, and therefore ADHD, to dogmatism in a relatively straightforward manner. Lopez et al. (2015) found that in a test of dimensions of impulsivity, ADHD-C representations show higher urgency and sensation seeking, which in turn represents a potential predictor for readiness for ideological violence (Zmigrod & Goldenberg, 2021). Therefore, considering the elevation of dimensions of impulsivity in ADHD-C and ADHD-H, individuals might also show higher levels of dogmatism compared to ADHD-I; with differences in levels of dogmatism perhaps being larger between ADHD-C and -H compared to between ADHD-I and controls.

Based on these considerations, I am formulating the following hypotheses:

H_{Ia}: *Impulsivity is positively associated with dogmatism*.

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[2] be it as a behavioral or a personality feature, depending on which classification or model is used (for a critical review of impulsivity as a psychological construct, see Strickland & Johnson, 2021)

H_{Ib}: *This association is different in size for people with and without indication of having an ADHD diagnosis.*

H_{II}: *Combined primary presentation of symptoms in comparison to no symptoms are associated with an elevated dogmatic attitude.*

H_{III}: *For those with an ADHD diagnosis, indicated medication status is negatively associated with dogmatism.*

Method

As was mentioned in an earlier section, this case study aims to explore the potential influence of ADHD symptoms on levels of dogmatism and whether this relationship may be explained by the impulsivity level Impulsivity level is also implicated in the primary presentation of symptoms or could be affected by taking medication for the management of symptoms. ADHD symptoms cannot be ethically or practically randomized, which necessarily implies the comparison of pre-existing groups. Thus, considering all hypotheses, these questions will be inspected through a cross-sectional as well as a correlational lens. To test my hypotheses, I conducted a non-experimental online survey study.

The cross-sectional design pertained to either the non-ADHD and ADHD group or ADHD subgroups, as well as correlational research based on CAARS[3] subscale scores' relationship with other continuous measures. The independent variables consists of the ADHD profile (e.g., impulsivity score) and were thus experimenter-selected and not manipulated. The dependent variable is dogmatism. I also inquired about certain co-morbidities, age, gender, country of

[3] Measures will be explained in more detail in a later section.

residence, as well as occupation and further assessed fluid intelligence to control for differences between the groups as well as to be able to infer sample characteristics regarding generalizability considerations.

Because of the more exploratory nature of this endeavor and in consideration of target population characteristics, such as problems with attention, the test battery ought to be kept as short in duration as possible, hence, lessening the burden for participants, while still attaining a large enough amount of data to infer meaningful enough insights to build upon from. The short test duration was made even more crucial after deciding to employ an online format to be able to disseminate the survey more widely, as it is arguably very easy to get distracted on a smart phone or computer and thus cut short the filling out of a survey. In turn, this also meant requiring participants initially to truthfully indicate available diagnoses and medication status, since a fully online diagnostic evaluation was neither ethical nor feasible. After explaining the strategies regarding inclusion of participants and the utilized procedure, the used measures will be discussed.

Participants

Only adults over the age of 18 were asked to participate. Informed consent was attained from every participant before beginning the study. All participants were administered the same tasks and study measures (entire test-battery) which was delivered online via computer or mobile phones. A sample of $N = 273$ (women: $n = 192$, men: $n = 63$, other: $n = 13$, NA: $n = 3$) participants was collected via dissemination of a SoSci-Survey (Leiner, 2019a) link over the social media platforms such as Facebook, WhatsApp, Discord, Instagram, and LinkedIn. The primary exclusion criterion was to be younger that 18 years old ($n = 2$ participants were removed for indicating ages under 18). Moreover, certain steps had been taken to ensure people with ADHD would be reached for the purpose of this study. This was achieved by intentionally disseminating the survey in

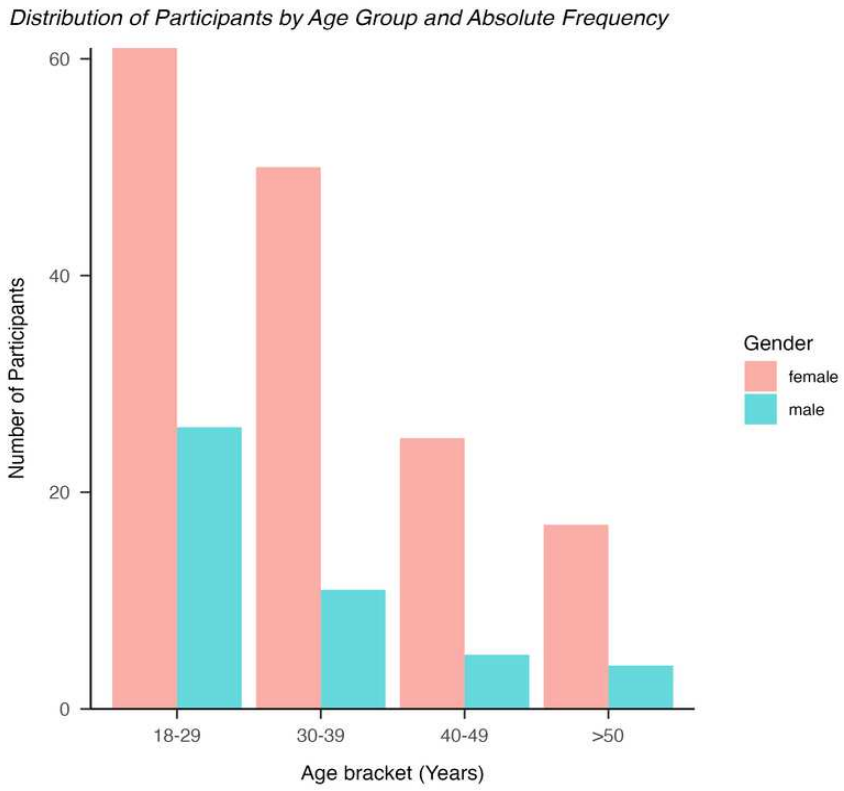
ADHD themed social media groups and/or asking for the help of such accounts in reaching the target group. Although the exact purpose was veiled in communication with prospective participants, I did highlight the ADHD focus when targeting people with ADHD (if known). This information was omitted in communication with people where ADHD status was either not given or unknown, to avoid biasing answers towards avoidance/seeking of appearing less/more like having ADHD.

Because of the cross-sectional design and the applied statistical analysis, only participants who completed the questionnaire in full were included. Data of $n = 10$ cases were excluded due to being extreme outliers (z-scores above or below 3.29) in the time they took to work on the whole survey, as this is often a good indicator for "careless" responses (Leiner, 2019b; p.229). Once entered into Excel, I manually scanned the data for extreme answer patterns (e.g., clicking on the same category for over 50% of answers in the Conner's Adult ADHD Rating Scale: Short Form (CAARS:S) sub-scales, or in more than 70% in the dogmatism scale) but could not find any noticeable cases. The CAARS:S allows investigating answers for inconsistency and it is recommended to not interpret answers deemed as inconsistent for the patient. For this study, cases with inconsistent answer patterns were likewise deemed uninterpretable and thus excluded ($n = 50$). Additionally, non-availability of fitting norm tables for missing age values or gender categories other than male or female meant assignment of CAARS:S scores was impossible and thus further cases had to be excluded ($n = 10$). The remaining sample consisted of $N = 199$ participants (women: $n = 153$, men: $n = 46$). Post hoc power analysis revealed a power of 94% to find small effect sizes ($f^2 = 0.10$) (see appendix for details).

Although the age span is 54 years (range: 18-72), many participants fall within a lower age bracket, with half being 30 years old or younger ($Mdn = 30$; IQR = 15), as can be seen in Graph

1. Approximately half of the sample have indicated working as a salaried employee (51.3%, *n* = 102) at the time of filling out the survey; with the second largest group being students/in higher education (20.6%, *n* = 41) and other occupations averaging less than 10% per option (i.e., see *Table 1* for occupation categories). The survey was accessible in German as well as in English, yet inaccessible to screen readers due to the nature of two tasks, that included visual cues. Most participants chose German (88.9%, *n* = 177), and the rest filled out the material in English (11.1%, *n* = 22). Every participant filled out the same battery of questionnaires and completed the same tasks, including the ADHD rating scales, irrespective of having indicated a diagnosis of ADHD or not. There was neither monetary nor any other incentive provided for participants due to financial constraints.

Figure 1



Note. The histogram shows that the variable age (age brackets acc. to CAARS:S norm tables) has a right leaning skew with most participants falling within the youngest age group (being 18 to 29 years old).

Procedure

Prior to testing, participants were asked to indicate which language - German or English (depicted as the flag of Germany or the United Kingdom, as pre-set by the SoSciSurvey Platform) - they would like to take the questionnaire in. I then informed them about the purpose of the study whereby the actual goal was disguised, and participants were told that the goal was to investigate "general behaviors and personality in relation to performance in creative play (…) to find out, how these games are experienced and performed by different people" (see appendix for complete wording). They were also given contact options for questions and further inquiries. Anonymity was granted and further ensured by only attaining a minimum of demographic information, e.g., participants were asked to firstly identify their gender ("man", "woman" or "other", with request for further specification) and age. They were also asked to indicate their occupational status ("in school", "in training", "student (higher education)", "salaried employee", "clerk/public service", "self-employed", "unemployed/seeking work" or "other", with request for further specification) and current country of residence.

Before each task (or questionnaire), participants were given detailed instructions on how to proceed (see full instructions used for each task in appendix). The test battery started out with an ADHD assessment, which was veiled as a [test of current functioning in various life domains]. Participants were then presented with the Raven's Standard Progressive Matrices (RSPM) test and finally, Altemeyer's dogmatism measure (DOG scale; respective scales explained in more depth below, including a full screen-by-screen account in appendix). The order was chosen, to allow for

maximum engagement and ease while testing, specifically considering the challenges of the targeted sample of participants with ADHD. That is, engagement and easy was provided by placing the longest questionnaire at beginning to get it "out of the way", have a game-like test in the middle, and a brief, thus "do-able", questionnaire at the very end. While this necessarily implies a lack of control for order effects via randomization of survey-battery components, a maximum level of engagement was deemed crucial to maintain high completion rates of the survey among targeted groups.

After completion of the final test, a short survey of current diagnoses, with options pertaining to ADHD, including indication of current use of ADHD medication, depression, anxiety, bipolar disorder, ASD, and other diagnoses was indicated for checking off. Two open commentary boxes were provided on the same screen, one encouraging more detailed accounts of given indications (e.g., medication type, ADHD subtype, etc.) and another for general feedback to the study. To conclude the test battery, I fully debriefed and thanked the participants. I acquired their consent for data use and after, the questionnaire was terminated.

Measures

The battery of measures used will be explained in more detail in the next subsections. Materials were generally provided online. Participants could use a computer or smartphone to access it. No new measures were introduced as part of this study. In the interest of brevity, examples of the material are given in English only. A full layout of shown tasks and questionnaires per page as well as their translation in German is attached in the appendix.

ADHD - Conners' Adult ADHD Rating Scales (CAARS-S:S).

A short ADHD assessment tool is included. However, it was not used for diagnostic intent, for which it would be insufficient, but to account for symptom levels and further to infer

presentations present within the given sample. This allows for comparisons along primary symptom representations.

The German edition of the 26-item short version of the Conners' Adult self-report scale (Christiansen et al., 2011) allows for assessment of current functioning in adults (ages 18 and up). Each item is rated on how often its contents are experienced by the participant on a 4-point Likert-type scale ranging from 0 = 'Not at all, Never' to 3 = 'Very much, Very frequently'.

Higher sub-scale scores indicated lower current functioning in the respective domain, related to: (1) Inattention/Executive Functioning (Cronbach's $\alpha = 0.90$; concerning e.g., troubles with concentration, task completion, planning and organization), (2) Hyperactivity/Restlessness (Cronbach's $\alpha = 0.83$; concerning e.g., intense feelings of restless, fidgeting), (3) Impulsivity/Emotional Lability (Cronbach's $\alpha = 0.84$; concerning e.g., low frustration tolerance, frequent mood changes, heightened tendency for impulsive actions), (4) Problems with Self-Concept (Cronbach's $\alpha = 0.89$; concerning e.g., low or lack of social relationships, self-esteem and self-confidence) and the overall (5) ADHD Index (Cronbach's $\alpha = 0.91$) which indicates the participants 'risk' for having ADHD or overall intensity of ADHD-symptoms.

The CAARS-S:S thus attains scores on five sub-scales, comprising of five items each, except for the ADHD-Index, which is composed of 15 items (some items therein overlap with items from the other sub-scales). The raw scores are converted into T-scores based on age, sex, and sample origin (e.g., online), and a T-score threshold of 70 (1.5 standard deviations above the population mean) is used to identify individuals with elevated symptom severity in low-risk

populations (lower thresholds should be used in clinical settings, such as for patients in psychiatric care), distinguishing them from non-clinical cases (Conners et al., 1999)[4].

ADHD-subtype proxies (Leiner, 2019) per participant are oriented around T-values for the first three sub-scales. Specifically, high Hyperactivity/Restlessness score *and* a high Impulsivity/Emotional Lability score are classified as ADHD-H; a high Inattentiveness/Executive Functioning score as ADHD-I; and high scores on all three sub-scales are assigned the ADHD-C sub-type.

The CAARS-S:S was selected as a means of inferring presentation of ADHD symptoms, because these symptoms exist on a spectrum and are present to varying degrees in the general population, as demonstrated by Overbey et al. (2011). Additionally, the CAARS-S:S also has high psychometric quality and content validity as a scale for identifying ADHD in adults (Christiansen et al., 2011, 2013; Solanto et al., 2004; Taylor et al., 2011). Determining symptom-presentation per participant corresponding to trends in respective CAARS-S:S sub-scales (e.g., Mattingly et al., 2012; Yoon et al., 2013; APA, 2022) will allow me to explore potential differences between groups pertaining to dependent variables (e.g., classifying sufficiently elevated inattention/EF scores as a primarily inattentive presentation). While not adequate for diagnostic purposes (one reason being the lack of childhood assessment, but see Conners et al., 1999 for a full list of suggestions for

[4] If a participant indicated having a diagnosis of ADHD, they were placed in the 'high ADHD risk' group in the ADHD-Index sub-scale, regardless of actually scored T-value.

evaluation), this serves to attain a proxy for the intensity of ADHD symptoms per person for the purposes of this study.

Some studies chose to exclude comorbidities from their design to arrive at purely ADHD related patterns. I chose not to restrict the sample in this regard, because as the literature indicates, such comorbidities are not only highly common in people with ADHD (Sobanski et al., 2007; Torgersen et al., 2006), but ADHD might even play a role in causing those same comorbidities (e.g., Kessler et al., 2006; Sandstrom et al., 2021). Anecdotally, ADHD often gets misdiagnosed for depression or anxiety - more so in women (e.g., Antoniou et al., 2021; Rucklidge, 2010; Solberg et al., 2018; Yoshimasu et al., 2018), which can then appear to be resistant to treatment as the underlying source - the ADHD - is overlooked (e.g., Sternat et al., 2018).

Intelligence - Raven's standard progressive matrices task (RSPM; Raven, 1938).

A revised and condensed version of Raven's SPM (RSPM-9, Form A, Bilker et al., 2012; Raven et al., 1990) was used to assess fluid intelligence. The task consisted of nine multiple-choice questions with progressively more challenging visual patterns. Participants had to select the appropriate patterned item from a selection of response possibilities since one element of each matrix design was missing (KR-20 = 0.68).

Intelligence might confound the relationship with dogmatism, especially in participants with ADHD, since it might lend a coping ability/ increased resources to question one's beliefs,ergo, be less dogmatic (e.g., Hoogman et al., 2020; Zmigrod et al., 2019). However, there is also evidence, suggesting that ADHD symptoms may undermine intellectual performance and thus obscure true skills (Goodwin et al., 2011). I chose to account for intelligence, employing the shortened version of Raven's Standard Progressive Matrices (RSPM) (Bilker et al., 2012; Raven

et al., 1990) in a computerized form (Williams & McCord, 2006). While the RSPM is more so intended for below-average-skills testing and the used short form (Form A) reflects that ceiling effect, the inclusion of a harder item is not recommended, when targeting clinical populations, due to frustration avoidance (Bilker et al., 2012).

Dogmatism - Altemeyer's (1996) measure of dogmatism

An 11-item shortened version (Shearman & Levine, 2006) of the original dogmatism scale (Altemeyer & Altemeyer, 1996) is used to evaluate participants' unjustified certainty around their belief system. The items were presented in order and in full across one screen, to be rated on a 5-point Likert-type scale ranging from 0 = 'fully agree' to 4 = 'fully disagree', with an example item stating, "I am a 'my way or the highway' type of person.". Positively worded items on the scale were reverse-scored and the resulting scores were summed with the scores from the negatively worded questions. A higher total score indicates a more unchangeable and unreasonable certainty around the infallibility of one's own belief system, thus an overall elevation in dogmatic thought patterns (Cronbach's $\alpha = 0.65$).

It was considered useful to refer to a scale that would capture dogmatism - an ideological attitude sans political content (opposed to e.g., a measure aimed at conservative leanings) and that has demonstrated validity and reliability in its used measure (Altemeyer & Altemeyer, 1996; H. Crowson et al., 2008; H. M. Crowson, 2009).

Consent to data use

Consent for data usage was attained via a simple question ("I read the debriefing and … allow the use of my information for scientific purpose/ …do not want my information to be used for scientific purposes. All data will be deleted."; see appendix). In case of refusal ($n = 1$), the

subjects answers were promptly deleted after downloading the raw data from the SoSciSurvey platform.

Statistical analysis

The sample is cleaned from unfinished surveys, underage participants (n = 1), outliers in how much time was taken to fill in the survey (n = 10), and whether answers were inconsistent in the CAARS-S:S sub-scales (n = 50) or unassignable due to gender minority indication or missing age information in adherence to CAARS-S:S norm tables (n = 10), putting the final sample size at N = 199, with n = 72 having indicated an ADHD diagnosis.

Considering implied data loss, I decided not to match for demographic variables - matched per age bracket and gender, as indicated by CAARS-S:S norm tables, a mere 4 participants per cell would have been maintained, reducing the sample size to n = 8x4 = 32 participants. Instead, controlling for confounds like age, gender, and fluid intelligence will be utilized. Other demographic variables, while reported to infer generalizability of results, are not controlled for in the analysis. For instance, additional diagnoses are not controlled for, because controlling for comorbidity in ADHD is not recommended, i.e., it would likely decrease the variance explained by ADHD itself (but see Shapiro et al., 2021 for a similar argument when controlling for gender).

The sample is described using relative and absolute frequencies for the categorical variables gender, language, country of residence, occupation, ADHD diagnosis, Medication for ADHD diagnosis, depression, anxiety, autism, bipolar disorder, and other diagnoses. Medians and ranges were used for continuous variables, such as age (*Mdn* = 30; range: 18-72), RSPM score (*Mdn* = 26,6; range: 9,8-56,2), CAARS-S:S Impulsivity Scale score (*Mdn* = 70; range: 51-90) and DOG Scale score (*Mdn* = 22; range: 12-45) as testing their distribution with Histograms and QQ-Plots and/or the Shapiro–Wilk test indicated non-normality. Clinical and social characteristics

(sex, age, fluid intelligence, occupation, language, country of residence and depression, anxiety, autism, bipolar disorder, other diagnoses) between cases and controls were compared using Chi-square tests for categorical variables (or Fisher's exact test when cells $n < 5$) or Kruskal-Wallis test for continuous variables, with one exception, as medication for ADHD diagnosis was compared within the ADHD sub-sample. Hypotheses were tested via linear regression. Effect sizes and Bayes factors for the respective models were determined.

Significance was set at $p < 0.05$. Data cleaning was carried out using Microsoft Office Excel and R Statistical Software (v4.2.2; R Core Team 2022), and statistical analyses were carried out using R Statistical Software (v4.2.2; R Core Team 2022).

Results

In my first hypothesis I stated that impulsivity is positively associated with dogmatism, and I assumed this association would be different for people with and without indication of having an ADHD diagnosis. And finally, I assumed that either primary symptom presentation (as indicated by an ADHD screening measure) in comparison to controls or medication status compared to those not indicating taking medication for their ADHD, would make a difference to dogmatism scores.

To test my hypotheses, I conducted respective linear regressions, each including covariates to control for confounding. The results are ordered in accordance with their relevance to the hypotheses. Before presenting these results, the study sample will be described in more detail.

Sample description

Sociodemographic characteristics are described via relative and absolute frequencies (see Table 1), separated by indication of ADHD diagnosis. Across the sample, many more participants chose to fill out the survey in German ($n = 117$), rather than in English ($n = 22$). A lot more women

(n = 153) than men (n = 46) participated in the survey in full. As previously mentioned, prior to cleaning the dataset, a dozen participants or so opted for the "other" gender category; and less than a handful of participants failed to enter any of the available options; both had to be omitted, due the CAARS test not providing norm tables for genders other than male/female. The age distribution appears skewed towards younger participants. Most participants appear to currently reside in German-speaking countries (e.g., Germany: n = 80; Austria: n = 93). A few participants also reside in other countries, for example, Egypt (n = 3) or Denmark (n = 2).

Table 1

Sociodemographic Characteristics of Participants

characteristic	ADHD		Controls		Full sample	
	n	*%*	*n*	*%*	*n*	*%*
Gender						
Female	58	69.6	95	62.1	135	76.9
Male	14	30.4	32	37.9	46	23.1
Country of residence						
Australia	1	1.4	-	-	1	0.5
Austria	24	34.3	69	55.6	93	47.9
Belgium	-	-	1	0.8	1	0.5
Bulgary	1	1.4	-	-	1	0.5
Denmark	1	1.4	1	0.8	2	1.0
Germany	39	55.7	41	33.1	80	41.2
Netherlands	-	-	1	0.8	1	0.5
Slowenia	-	-	1	0.8	1	0.5
Sweden	1	1.4	-	-	1	0.5
Schwitzerland	-	-	4	3.2	4	2.1
Egypt	-	-	3	2.4	3	1.5
Great Britain	-	-	1	0.8	1	0.5
USA	3	1.3	2	1.6	5	2.6
Occupation						
in school	1	100.0	-	-	1	0.5
in training	5	38.5	8	61.5	13	6.5
student (higher ed)	16	39.0	25	61.0	41	20.5
salaried employee	31	30.4	71	69.6	102	51.3
clerk/public service	3	25.0	9	75.0	12	6.0
self-employed	8	53.3	7	46.7	15	7.5

unemployed	6	66.7	3	33.3	9	4.5
other	2	33.3	4	66.7	6	3.0
Comorbidities						
Depression	29	80.6	7	19.4	36	18.1
Anxiety	19	73.1	7	26.9	26	13.1
ASD	2	66.7	1	33.3	3	1.5
Bipolar disorder	2	33.3	1	66.7	3	1.5
other	8	80.0	2	20.0	10	5.0
Medication for ADHD	36	50.0	-	-	36	18.1

Note. $N = 199$ ($n = 72$ with ADHD). Half of participants were 30 years old or younger (*Mdn* = 30; *IQR* = 15), with an age span of 54 years (range: 18-72), and participant age roughly equal across conditions. Most participants chose to fill out the survey in German ($n = 117$), rather than in English ($n = 22$).

Spurious information from open commentary boxes were derived on types of medication (or substances affecting symptoms), indication of ADHD subtype, suspicion of potential ADHD, and likely guessing in the RSPM task. Commentary box contents were manually inspected to gain additional insight on diagnosis details, medication, etc. and give an option for participants to share their feedback to the survey. Some participants admitted to guessing in the RSPM task ($n = 14$). Some gave more information on the type of medication ($n = 31$) they were using at the moment, some even indicated how long ago they ingested it or how high of a dose it was, see "tib_details" in the accompanying R code file for an overview, while a few other participants indicated their suspicion of having undiagnosed ADHD ($n = 13$) and a select few shared their ADHD subtype (combined ADHD: $n = 2$). While such qualitative information should help inform the interpretation of results, I decided against including them in the statistical analysis per se, as they do not maintain a full participant-by-participant account.

Over half of inconsistent answers in the CAARS evaluation are from participants with an ADHD diagnosis. Due to the online character of the survey, it was not possible for the experimenter to ensure proper filling of the questionnaires.

Covariates

First, an inspection of covariates will give context for which are included in the tested models. I investigated whether the variables of age, gender, fluid intelligence or inquired comorbidities were related to the variables of interest, that is dogmatism score, impulsivity score, indication of ADHD diagnosis and ADHD medication indication. *Age* was not significantly and positively correlated with impulsivity (τ = 7.06e-03, z = 0.16, p = .874), dogmatism (τ = 0.02, z = 0.46, p = .642), ADHD diagnosis (χ^2 = 1.1216, df = 1, p = .289), and ADHD medication indication (χ^2 = 0.0071954, df = 1, p = .932); *fluid intelligence* was not significantly and negatively correlated with impulsivity (τ = -2.09e-03, z = -0.05, p = .963) and dogmatism (τ = -9.35e-03, z = -0.21, p = .832), not significantly and positively correlated with ADHD diagnosis (χ^2 = 0.35143, df = 1, p = .553) and ADHD medication indication (χ^2 = 0.74031, df = 1, p = .389); *gender* was significantly and positively correlated with impulsivity (χ^2 = 114.13, df = 33, p < .001) and dogmatism (χ^2 = 38.659, df = 25, p = .039), and not significantly correlated with ADHD diagnosis (Fisher's exact test: p = .386) and ADHD medication (Fisher's exact test: p = .828); *depression* is not significantly correlated with dogmatism (χ^2 = 36.759, df = 25, p = .061), significantly correlated with impulsivity (χ^2 = 47.461, df = 33, p = .0494), and significantly correlated with ADHD diagnosis (Fisher's exact test: p < .001); *anxiety* is not significantly correlated with dogmatism (χ^2 = 37.592, df = 25, p = .051) significantly correlated with impulsivity (χ^2 = 49.452, df = 33, p = .033), and also with ADHD diagnosis (Fisher's exact test: p < .001); *autism spectrum disorder* is not significantly correlated with dogmatism (χ^2 = 27.436, df = 25, p = .335), impulsivity (χ^2 = 30.794, df = 33, p = .577) or ADHD diagnosis (Fisher's exact test: p = .297); *bipolar disorder* is not significantly correlated with dogmatism (χ^2 = 13.061, df = 25, p = .976), impulsivity (χ^2 = 39.409, df = 33, p = .205) or ADHD diagnosis (Fisher's exact test: p = .297); and *other diagnoses* are not significantly

correlated with dogmatism ($\chi^2 = 13.897$, $df = 25$, $p = .964$) or impulsivity ($\chi^2 = 25.646$, $df = 33$, $p = .8157$) either, but significantly correlated with ADHD diagnosis (Fisher's exact test: $p = .005$).

I will include gender as a covariate in subsequent statistical analyses. Other variables were decided against, for either lack of association with the variables of interest (fluid intelligence and age) or lack of representative sub-sample sizes (e.g., country of residence and occupation) or because control for confounding would risk eliminating overlapping variance explained by the independent variables of interest (e.g., internalizing disorders, like anxiety and depression, do co-occure more likely in adults with ADHD). Such variables will instead be used to make interpretative inferences about the generalizability of the sample.

Assumptions

Residuals of the regression models did not deviate significantly from normality according to histograms and Q-Q plots. A graphic check of residuals vs. fitted plots did also indicate linear patterns for residuals, while scale-location checks indicate homoscedasticity/assumption of equal variance and Cook's distance being unsuspicious regarding outlier detection. Since each of the VIF values for the predictor variables in the model are close to 1, multicollinearity is not a problem in the given models. Variance homogeneity of the scaling regression can be assumed.

Model fitting

Unless stated otherwise, standardized parameters were obtained by fitting the model on a standardized version of the dataset. 95% Confidence Intervals (CIs) and p-values were computed using a Wald t-distribution approximation.

H_{Ia}: *Impulsivity is positively associated with dogmatism*.

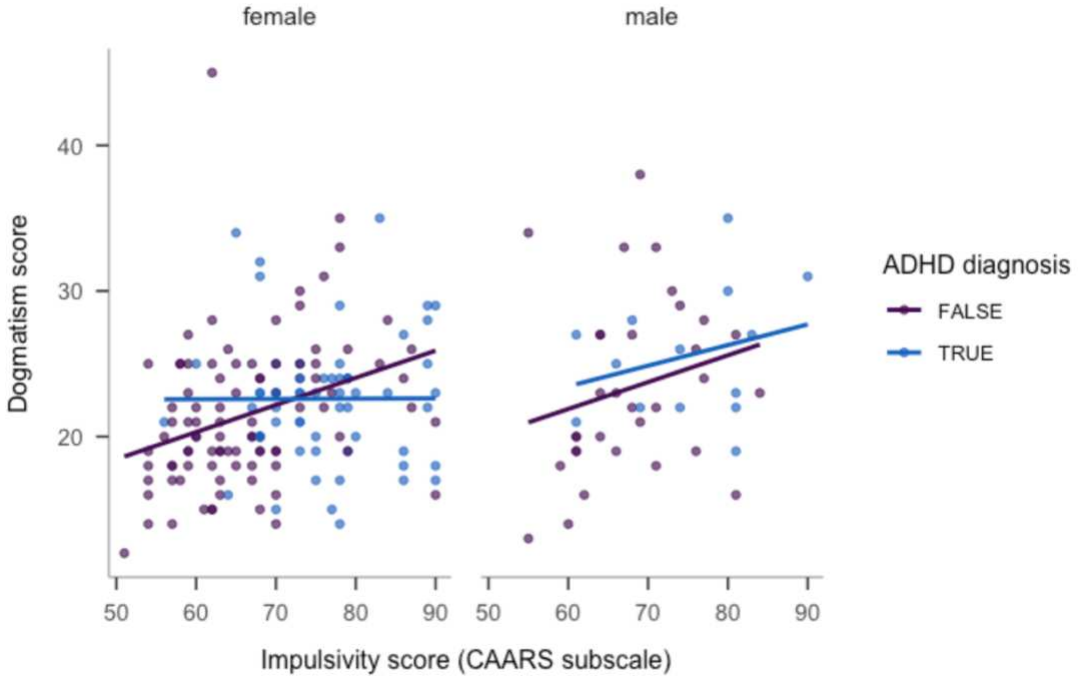
I fitted a linear model (estimated using OLS) to predict dogmatism with impulsivity and corrected by gender (formula: DOG_total ~ T_value_impulsivity + gender; Bayes factor = 203.8509 ±1.53% compared to a null model). The model explains a statistically significant and weak proportion of variance (R^2 = 0.09, F(2, 196) = 9.95, p < .001, *adj.* R^2 = 0.08). The model's intercept, corresponding to impulsivity = 0 and gender = female, is at 12.57 (95% CI [7.45, 17.69], t(196) = 4.84, p < .001). Within this model: The effect of impulsivity is statistically significant and positive (β = 0.13, 95% CI [0.06, 0.21], t(196) = 3.65, p < .001; β_{std} = 0.25, 95% CI [0.11, 0.38]. The effect of gender [male] is statistically significant and positive (β = 2.14, 95% CI [0.52, 3.76], t(196) = 2.60, p = .010; β_{std} = 0.42, 95% CI [0.10, 0.74]).

H_{Ib}: *The association between impulsivity and dogmatism is different in size for people with and without indication of an ADHD diagnosis.*

I fitted a linear model (estimated using OLS) to predict dogmatism with ADHD diagnosis and impulsivity, while controlling for gender (formula: DOG_total ~ ADHD_TRUE + T_value_impulsivity + gender; Bayes factor: 40.8822 ±1.03% compared to a null model). The model explains a statistically significant and weak proportion of variance (R^2 = 0.09, F(3, 195) = 6.61, p < .001, *adj.* R^2 = 0.08). The model's intercept, corresponding to ADHD_TRUE = 0, T_value_impulsivity = 0 and gender = female, is at 12.69 (95% CI [7.14, 18.25], t(195) = 4.51, p < .001). Within this model: The effect of ADHD is statistically non-significant and positive (β = 0.09, 95% CI [-1.53, 1.72], t(195) = 0.11, p = .912; β_{std} = 8.65e-03, 95% CI [-0.14, 0.16]). The effect of impulsivity is statistically significant and positive (β = 0.13, 95% CI [0.05, 0.21], t(195) = 3.15, p = 0.002; β_{std} = 0.24, 95% CI [0.09, 0.40]). The effect of gender [male] is statistically significant and positive (β = 2.14, 95% CI [0.51, 3.77], t(195) = 2.59, p = .010; β_{std} = 0.42, 95% CI [0.10, 0.74]).

Figure 2

Dogmatism predicted by impulsivity, separated by gender.



Note: When graphically separating regression lines by gender, it becomes clear that impulsivity is (positively) associated with dogmatism in all groups, except for women with ADHD.

H_{II}: *Combined primary presentation of symptoms in comparison to no symptoms are associated with an elevated dogmatic attitude.*

I fitted a linear model (estimated using OLS) to predict dogmatism with no primary symptoms[5] of ADHD and gender (formula: DOG_total ~ subtype_none + gender; Bayes factor = 0.6381505 ±2.22% compared to a null model). The model explains a statistically significant and weak proportion of variance (R^2 = 0.04, F(2, 177) = 3.37, p = .037, *adj.* R^2 = 0.03). The model's intercept, corresponding to subtype_none = 0 and gender = female, is at 22.47 (95% CI [21.02,

[5] i.e. named "subtype_none" in R code

23.92], $t(177) = 30.67$, $p < .001$). Within this model: The effects of no primary symptoms of ADHD are statistically non-significant and negative (β = -0.93, 95% CI [-2.61, 0.75], $t(177) = -1.09$, $p = 0.277$; $\beta_{std} = -0.08$, 95% CI [-0.23, 0.07]). The effect of gender [male] is statistically significant and positive (β = 2.25, 95% CI [0.44, 4.06], $t(177) = 2.46$, $p = 0.015$; $\beta_{std} = 0.43$, 95% CI [0.09, 0.78]).

H_{III}: *For those with an ADHD diagnosis, indicated medication status is negatively associated with dogmatism.*

I fitted a linear model (estimated using OLS) to predict dogmatism with medication taken for ADHD symptoms and controlled for gender (formula: DOG_total ~ ADHD_meds + gender; Bayes factor = 2.703981 ±0.73% compared to a null model). The model explains a statistically significant and weak proportion of variance ($R^2 = 0.11$, $F(2, 69) = 4.42$, $p = 0.016$, *adj.* $R^2 = 0.09$). The model's intercept, corresponding to ADHD_meds = 0 and gender = female, is at 21.67 (95% CI [20.16, 23.17], $t(69) = 28.66$, $p < .001$). Within this model: The effect of ADHD medication is statistically non-significant and positive (β = 2.02, 95% CI [-0.07, 4.10], $t(69) = 1.92$, $p = .058$; $\beta_{std} = 0.22$, 95% CI [-8.08e-03, 0.45]). The effect of gender [male] is statistically non-significant and positive (β = 2.61, 95% CI [-0.03, 5.25], $t(69) = 1.97$, $p = .053$; $\beta_{std} = 0.57$, 95% CI [-6.33e-03, 1.14]).

Discussion

In my first hypothesis (HIa: *Impulsivity is positively associated with dogmatism*.) I was able to build on the notion in the ideology literature that impulsivity is an apt predictor for dogmatic attitude. This is also reflected in the individual effects of the model, where impulsivity has a positive relationship with dogmatism. Counter to other findings in the literature, gender showed a larger effect on dogmatic attitude (at a medium effect size) over impulsivity (small effect size) in

the observed data. Thus, even when using a more "ADHD-type" measure of impulsivity, the literature on relevant personality or cognitive predictors for dogmatism posits impulsivity as a protagonist, a result which is shared by this study's investigation. Gender could however be a possible confounder of that relationship in certain populations.

While the second model (H_{Ib}: *This association is different in size for people with and without indication of having an ADHD diagnosis.)*, stating that ADHD diagnosis would make a difference to dogmatic outcomes beyond impulsivity, does attain a high Bayes Factor (>40), which is generally taken as very strong evidence for the model in the numerator (e.g., Rouder et al., 2009), it only explains a small proportion of variance. A closer look at individual effects even shows that while impulsivity and gender are indeed significant (with small to medium effect sizes), with women with ADHD as the only group showing no association between their impulsivity and dogmatic attitudes, indication of ADHD diagnosis does have a close to zero added effect on dogmatism on top of impulsivity alone. This would indicate that ADHD diagnosis is not necessarily a helpful differentiator for dogmatic outcomes, as long as impulsivity (and gender) is considered first. As for gender effects, in the relatively short history of ADHD research, women have not been well represented in the literature on ADHD, though that trend is slowly being reversed by studies specifically geared towards this population (e.g., Chronis-Tuscano, 2022; Holthe & Langvik, 2017; Lynn, 2019; Young et al., 2020). If a more gender sensitive approach is warranted for future investigations in the direction of ideological thinking with ADHD, the uptick in more general explorations might lend a helping hand in formulating hypotheses on the potential mechanism(s) behind this particular (non-)association.

In the third model (H_{II}: *Combined primary presentation of symptoms in comparison to no symptoms are associated with an elevated dogmatic attitude.*), restricting participants to those with

combined presentation of primary ADHD symptoms to compare with controls, did not show a relevant association with dogmatic attitude. However, the individual effect of gender showed a medium effect size. Again, this points towards ADHD, even in cases of inherently more 'impulsive' subgroups, not being a helpful predictor for distinguishing elevated dogmatic tendencies. Of course, a larger sample could generate more varied strata for all primary presentations (combined, primarily inattentive, and primarily hyperactive), which would in turn allow re-investigation of associations that were potentially overlooked in this simplified approach. However, as most adults with ADHD tend to show combined or inattentive primary symptoms, which is to say that inattentive symptom presentations are typically categorized as less impulsive, thus perhaps still showing the observed (or lesser of an) effect on dogmatic outcomes due to inherent (lack of) impulsivity.

Finally, while the last model (H_{III}: *For those with an ADHD diagnosis, indicated medication status is negatively associated with dogmatism.*) comparing medication effects on dogmatism attains a moderately sized Bayes factor, it only explains a small proportion of variance with the effect of medication on dogmatic attitude being small, yet, somewhat surprisingly, positive, with medicated individuals with ADHD attaining higher scores for dogmatism. The surprise stems from medication, most often stimulant medication, for ADHD usually aiding in lowering impulsivity and inattention for individuals, thus leading to, for instance, less adverse life outcomes (e.g., Boland et al., 2020). While it does beg the question of how such a counterintuitive effect could appear, any attempt to explain potential mechanisms in that direction are limited due to no available literature on the intersection of dogmatism and ADHD. However, as this investigation is based on a relatively small sample size, an attempt to improve chances of

explanation should include appropriate study design choices (see also next section on limitations). The effect of gender on dogmatism is yet again at a large effect size and positive for male gender.

Limitations

Future research directions are suggested by a number of potential or definite limitations in the current study.

Though not intended for participants with ADHD specifically, the various sources of potential sampling bias put forward by Rødgaard et al. (2022) as well as Yilmaz & Alper (2019) in their work on recruiting participants with autism from social media applies here. This means that results found may not generalize to the broader ADHD population due to some specific factors such as a reversed sex ratio, higher employment rates or education level, and lower fraction of individuals with intellectual disability.

The skew towards participants from WEIRD (Western, Educated, Industrialized, Rich and Democratic; (Henrich et al., 2010)) societies may have confounded the dogmatism scores, as previous research has found correlations between social conservatism and the CogReflectionTest (Yilmaz & Alper, 2019). This suggests that countries with higher levels of liberal education might have contributed to the observed variance within society. Additionally, the majority of participants were undergraduate students, with high prevalence and severity of ADHD symptoms among them, which may be linked to the distinct stressors of university life, characterized by new challenges in academics, social interactions, and independent living (Robotham & Julian, 2006).

General social desirability effects in self-report scales and the distribution of the sample mainly through social media, particularly targeting young women with ADHD, may have worked to limit dogmatism score range further. This skew towards lower dogmatism scores might have

weakened the behavioral validity of findings as well as limited interpretation to lower levels of dogmatism as predictor relationships may vary for different levels of outcomes.

Certain control variables were skewed or had low numbers, which may indicate more potential sources of bias and thus hinder the generalizability of the study. The bias towards German-speaking participants also restricts its application to other languages or countries. Using education level instead of occupation categories would facilitate comparison with other studies. Additionally, a more balanced gender ratio would provide a better backdrop for considering gender as a confounding factor in the analysis. Similarly, the age distribution of participants skewed towards younger individuals. This could be attributed to the survey being primarily distributed online, where younger generations are more familiar and proficient with using the internet and social media platforms.

Striving for a representative sample across various aspects or implementing post-collection measures to match and stratify data, will enhance the significance of insights in future studies. This approach prevents the risk of limited generalizability by avoiding the examination of only a specific subgroup within the general population. Additionally, the absence of sufficient literature underscores the preliminary nature of these findings.

In the context of this study, participants indicating an ADHD diagnosis were categorized into the "high ADHD risk" group within the ADHD-Index sub-scale, irrespective of their actual T-value scores. This introduces a light bias as individuals with ADHD may not necessarily exhibit highly elevated scores in this specific CAARS-S:S sub-scale, despite their diagnosis. While this approach diminishes the likelihood of identifying a significant relationship between the measured variables, it contributes to a more conservative investigation. Moreover, the inherent challenge of

soliciting diagnoses lies in the potential for inaccurate responses, influenced by the prevailing societal stigma associated with clinically relevant mental health disorders.

Conversely, the diagnostic process's pivotal aspect involves cognitive evaluation, with a specific focus on assessing current functioning (Gualtieri and Johnson, 2005 in LeRoy et al., 2019). The fifth and final component of this diagnostic process involves neuropsychological testing, providing the sole objective data. It is crucial to note that the study employs these indicators as measures of symptom severity rather than making formal diagnoses (Taylor et al., 2011). However, acknowledging the limitation, a more varied assessment of ADHD was intentionally omitted to accommodate considerations of feasibility, particularly in terms of time and effort demands towards participants for a preliminary exploration. Results derived from inferences were deliberately withheld from participants to mitigate the potential for misinterpretation.

While the utilized operationalization of impulsivity was derived via considerations for an economic design, while still "matching" the symptoms found in the group of interest. A more comprehensive test battery beyond ADHD-specific impulsivity could enhance and provide nuance to future research. Notably, trait measures, susceptible to response bias, may not effectively capture variability, especially when used as more of a state measure in specific contexts. Integrating state and trait approaches is recommended for a comprehensive understanding, while behavioral tasks are suggested alternatives, less prone to biases and language dependence.

The classification into ADHD symptom presentation groups deviates from conventional practices (e.g., DSM-5 criteria), acknowledging that a thorough diagnostic evaluation is typically more comprehensive. However, for the exploratory purpose of this study, the chosen approach was deemed sufficient. A more extensive undertaking would benefit from considering a more thorough evaluation. This consideration would also deem the challenge of checking for authentic cases in

the given sample redundant. Up to 50 cases were showing potential signs of over-report in ADHD symptoms as indicated by the CAARS Infrequency Index (CII) for identifying authentic cases of ADHD. However, more than 50% of inconsistent responses in the CAARS evaluation were from individuals diagnosed with ADHD. The online nature of the survey certainly prevented the experimenter from ensuring the proper completion of questionnaires, potentially influenced by factors such as unclear instructions or inherent characteristics of the online space and target group, including distractibility. Future research might aim towards ensuring a more controllable testing environment.

During data collection, feedback indicated instances of guessing in the RSPM test, particularly among individuals with ADHD. However, this is already addressed, as irregular answer patterns (e.g., correct responses for more difficult items but incorrect ones for easier ones) would signal potential guessing or other factors leading to an unattainable score.

Finally, the study's limitations include a relatively small sample size, constraining the statistical power, particularly in comparisons between ADHD presentations.

Conclusions

Adding the indication of ADHD diagnosis or investigating the effect of primarily combined presentation of symptoms for ADHD did not largely affect dogmatic attitude, while medication showed a small positive effect on dogmatic outcomes for those taking medication for ADHD. This means that the inspected models show a relatively clear pattern of non-difference for various distinctions in regard to ADHD or its associated markers. This result might invite speculation: if ADHD is assumed to be inherently related to heightened levels of impulsivity which ought to elevate dogmatic attitude, what other factor, perhaps also associated with ADHD, could work

against the expected effects thus canceling out or weakening effects of impulsivity? This could be an avenue for future research looking into potential strengths of individuals with ADHD, such as creativity or divergent thinking and (cognitive) flexibility, which might all indicate non-dogmatic thinking.

On the other hand, this means that models including medication status as a predictor might be worthy of further inspection, especially given the somewhat counterintuitive result of ADHD medication being (albeit non-significantly) associated with somewhat heightened dogmatism scores. Another surprising result has been the relevance of gender, namely male gender, in association with increased dogmatism scores. This relationship is not necessarily reflected in the literature on dogmatism specifically. In light of having noted problems with the definitions of applied concepts in this study, it is also worthwhile and important to further include and build upon research made on alterations in core computations in ADHD, in linkage with higher level symptoms and cognitive style, with the help of behavioral tasks and computational modelling, as this would increase mechanistic understanding and identify more explained variance in comparison to testing singular concepts (see e.g., Rollwage et al., 2019). Finally, it should be said, that a lack of difference does not necessarily imply a lack of association. Thus, further investigation of the effects of neurodivergent processing and associated behavioral outcomes on ideological thinking, could prove worthwhile in formulating more targeted strategies for inoculating or supporting those groups in dealing with ideological content more generally.

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Appendix

Abstract in German

Diese Masterarbeit untersucht den Einfluss von ADHS auf Dogmatismus, motiviert durch die wachsende Anerkennung von Neurodiversität und ein spezifisches Interesse an ADHS. Sie stellt eine Verbindung her zwischen aktueller ADHS-Forschung und der Untersuchung der kognitiven Grundlagen ideologischen Denkens, um die Untersuchung des Einflusses von ADHS auf Dogmatismus zu rechtfertigen, wobei ein Schwerpunkt auf Impulsivität als einem Schlüsselmerkmal liegt. Die neuro-kognitiven Merkmale von ADHS werden als Einflussfaktoren auf ideologische Überzeugungen positioniert, untersucht über den Diagnosestatus, eine primär kombinierte Darstellung von impulsiven, hyperaktiven und unaufmerksamen Symptomen im Vergleich zu Nicht-ADHS-Kontrollen. Innerhalb der Gruppe mit einer ADHS-Diagnose wird auch der Medikationsstatus in Bezug auf seinen potenziellen Effekt auf Dogmatismus-Niveaus erforscht. Um dies anzugehen, wird eine nicht-experimentelle Online-Umfrage für Erwachsene skizziert, um die Beziehung zwischen ADHS-Symptomen, Impulsivität und Dogmatismus zu bewerten, unter Verwendung von Werkzeugen wie den Conners' Adult ADHD Rating Scales und Altemeyers Dogmatismus-Messung. Die Ergebnisse deuten darauf hin, dass eine ADHS-Diagnose und Symptompräsentation die dogmatischen Einstellungen nicht signifikant verändern, aber die Verwendung von Medikamenten einen leicht positiven Einfluss auf die dogmatische Einstellung hat, was darauf hindeutet, dass weitere Forschungen zur Rolle der Medikation erforderlich sind. Überraschenderweise korrelierte das männliche Geschlecht mit höherem Dogmatismus, was von der bestehenden Dogmatismus-Forschung abweicht und keinen Effekt des Geschlechts auf die dogmatische Einstellung anzeigt. Die Dissertation schließt mit dem Vorschlag, dass zukünftige Studien sich auf die potenziell positiven Eigenschaften von ADHS, wie Kreativität, konzentrieren

sollten, um dessen Einfluss auf dogmatisches Denken besser zu verstehen. Schließlich wird, nach Reflexion über die Einschränkungen der Stichprobe, für vielfältigere Stichproben plädiert, um die Generalisierbarkeit der Forschung und die Einblicke zu verbessern.

CARS - German Items:

1. Ich unterbreche andere beim Sprechen.
2. Ich bin immer auf Achse, wie von einem Motor getrieben.
3. Ich bin schlecht organisiert.
4. Ich kann nur schwer für sehr lange Zeit an einem Platz bleiben.
5. Ich habe Schwierigkeiten, mehrere Dinge gleichzeitig im Blick zu behalten.
6. Ich bin schnell gelangweilt.
7. Ich bin leicht aufbrausend.
8. Ich habe noch immer Wutanfälle.
9. Ich vermeide neue Herausforderungen mangels Vertrauens in meine Fähigkeiten.
10. Ich suche mir schnelle, aufregende Aktivitäten.
11. Ich fühle mich innerlich unruhig, selbst wenn ich stillsitze.
12. Dinge, die ich sehe oder höre, lenken mich von dem ab, was ich gerade tue.
13. Viele Dinge können mich leicht irritieren.
14. Ich bleibe mit meinen Leistungen hinter meinen Fähigkeiten zurück.
15. Ich bin übermäßig selbstkritisch.
16. Nach außen hin verhalte ich mich normal, aber innerlich bin ich unsicher.
17. Ich erledige Angelegenheiten nicht, außer unter äußerst hohem Termindruck.
18. Ich habe Schwierigkeiten mit einer Aufgabe zu beginnen.
19. Ich mische mich in die Aktivitäten anderer Leute ein.
20. Meine Launen sind nicht vorhersehbar.
21. Ich bin bei alltäglichen Aktivitäten geistig abwesend.
22. Manchmal bin ich mit etwas so beschäftigt, dass ich nichts um mich herum mitbekomme; bei anderen Gelegenheiten werde ich von allem abgelenkt.
23. Ich neige dazu, herumzurutschen oder zu zappeln.

24. Ich kann mich nicht konzentrieren, außer es ist wirklich interessant.
25. Ich wünschte ich hätte größeres Vertrauen in meine Fähigkeiten.
26. Mein Versagen in der Vergangenheit macht es mir schwer, an mich selbst zu glauben.

DOG-Scale:

1. Leute, die mit mir nicht übereinstimmen, liegen normalerweise falsch.
2. [R] Viele Perspektiven auf eine Angelegenheit zu haben ist üblicherweise erwünscht.
3. Es gibt einen bestimmten richtigen Weg, um die meisten Dinge zu erledigen.
4. [R] Unterschiedliche Meinungen und Herkünfte sind wertvoll in jeder Gruppe und Organisation.
5. [R] Es ist wichtig für unterschiedliche Meinungen offen zu sein.
6. Ich bin jemand zu dem die Devise "Entweder so oder gar nicht. /Entweder du tust, was ich sage, oder du kannst gehen!" passt.
7. [R] Es gibt oft mehrere mögliche und geeignete Wege ein Problem zu lösen.
8. [R] Ich sehe mich selbst als sehr aufgeschlossen.
9. [R] Unterschiedliche Meinungen sollten angeregt/ermutigt werden.
10. Menschen, die sich stark von uns unterscheiden, können gefährlich sein.
11. Ich bin festgefahren in meinen Gewohnheiten.

[R] : Reverse coded

Page-by-page-account of survey, in English:

0% completed

Dear participant,

thank you for participating in this study, which is part of my master thesis (Anicca Egger) under the supervision of Dr. Claus Lamm and Co-Supervision of Dr. Lei Zhang. On the next page you will receive more information on the study goal and the procedure.

This survey will take **about 15 minutes** to complete.

Your answers will be handled with confidentiality and used for scientific purposes only. Any given data is processed **anonymously**. Your participation is voluntary and can be withheld at any point during this survey.

Thank you very much for your participation!

Next

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5% completed

Study goal

In this study, **general behaviours and personality in relation to performance in creative play** will be assessed in the form of two questionnaires as well as two games. The aim of the study is to find out **how these games are experienced and performed by different people**.

Procedure

At first you will be asked to indicate some general demographical information. The first questionnaire will then be presented to you. You can answer these simply by clicking on the answer option that suits you best. After that, a puzzle game will challenge you to complete and find the rules to given patterns. In the second game you will have to associate alternative ways of using two presented objects. Finally, there is a short questionnaire about your personality and on more demographical information.

Proper instructions will be given for each exercise - please read them carefully!

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10% completed

How old are you?

I am ☐ years old.

Please indicate your gender:

- ◯ woman
- ◯ man
- ◯ Other (please indicate): ☐

- ◯ prefer not to say

What do you do for a living?

- ◯ in school
- ◯ in training
- ◯ Student (higher education)
- ◯ salaried employee
- ◯ clerk/public service
- ◯ self-employed
- ◯ unemployed/seeking work
- ◯ Other: ☐

In what country do you currently live in? (if you get an error, please try the original name in the local language)

Country: ☐ ☐ prefer not to say

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15% completed

Questionnaire of emotions and behaviour:

Listed below are statements concerning behaviours or problems sometimes experienced by adults. Read each statement carefully and decide how much or how frequently each statement describes you recently. Indicate your response for each item by choosing the frequency that corresponds to your choice.

When you feel uncertain, please choose the frequency closest to your most fitting answer.

Recently, it has been my experience that ...	not at all/ never	just a little/ once in a while	pretty much/ often	very much/ very frequently
I interrupt others when talking.	○	○	○	○
I am always on the go, as if driven by a motor.	○	○	○	○
I'm disorganized.	○	○	○	○
It's hard for me to stay in one place very long.	○	○	○	○
It's hard for me to keep track of several things at once.	○	○	○	○
I'm bored easily.	○	○	○	○
I have a short fuse/ hot temper.	○	○	○	○
I still throw tantrums.	○	○	○	○
I avoid new challenges because I lack faith in my abilities.	○	○	○	○
I seek out fast paced, exciting activities.	○	○	○	○
I feel restless inside, even if I am sitting still.	○	○	○	○
Things I hear or see distract me from what I'm doing.	○	○	○	○

Many things set me off easily.	○	○	○	○
I am an underachiever.	○	○	○	○
I am overly self-critical.	○	○	○	○
I act normal on the outside, but on the inside I'm insecure.	○	○	○	○
I can't get things done, unless there is an absolute deadline.	○	○	○	○
I'm having trouble starting a task.	○	○	○	○
I intrude on others' activities.	○	○	○	○
My moods are unpredictable.	○	○	○	○
I am absent-minded during everyday activities.	○	○	○	○
Sometimes my attention narrows so much that I am oblivious to everything else; other times it is so broad that everything distracts me.	○	○	○	○
I fidget (with my hands or feet) or squirm in my seat.	○	○	○	○
I can't keep my mind on something unless it's really interesting.	○	○	○	○
I wish I had greater confidence in my abilities.	○	○	○	○
My past failures make it hard for me to believe in myself.	○	○	○	○

20% completed

Thinking of alternate uses for everyday objects:

In the following task you are asked to name as many ways of using the items presented here as possible. A total of **two objects** are presented one after the other.

You have **two minutes per item** to list **as many uses as possible**. There are no wrong answers!

An item might look like this:

Answers:

1. automobile
2. swing (on a rope)
3. ...

After clicking on "Next" the first item will be presented!

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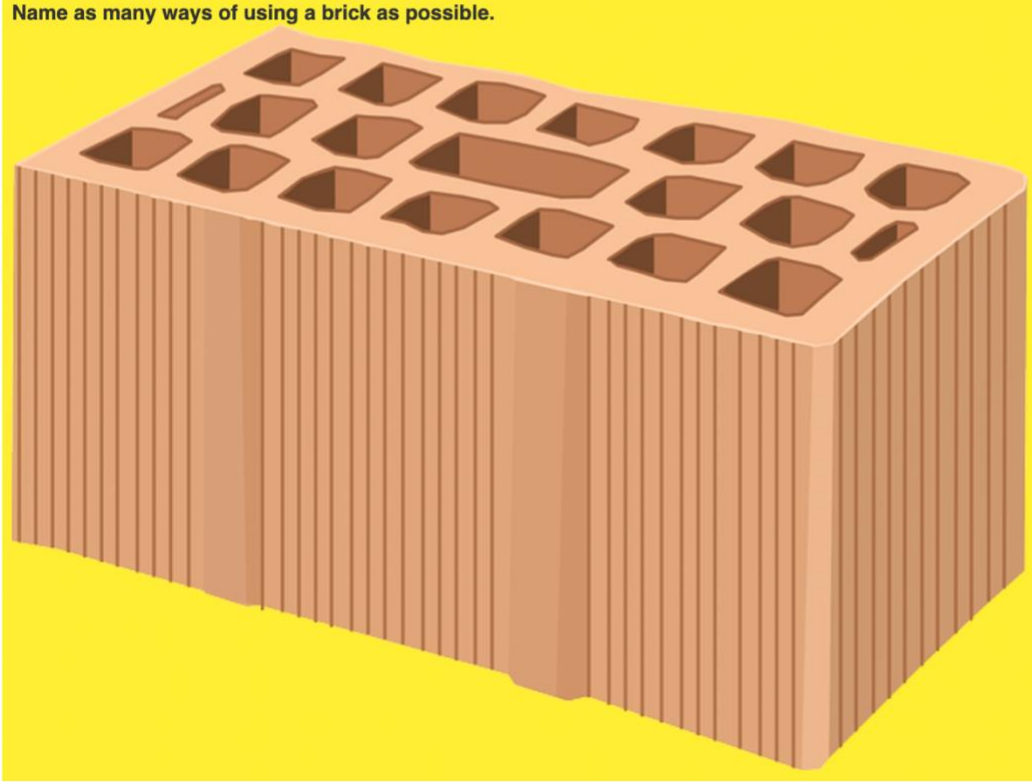
25% completed

Name as many ways of using a brick as possible.



Enter answers here:

1:32

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30% completed

Name as many ways of using newspapers as possible.

Enter answers here:

1:37

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Next

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35% completed

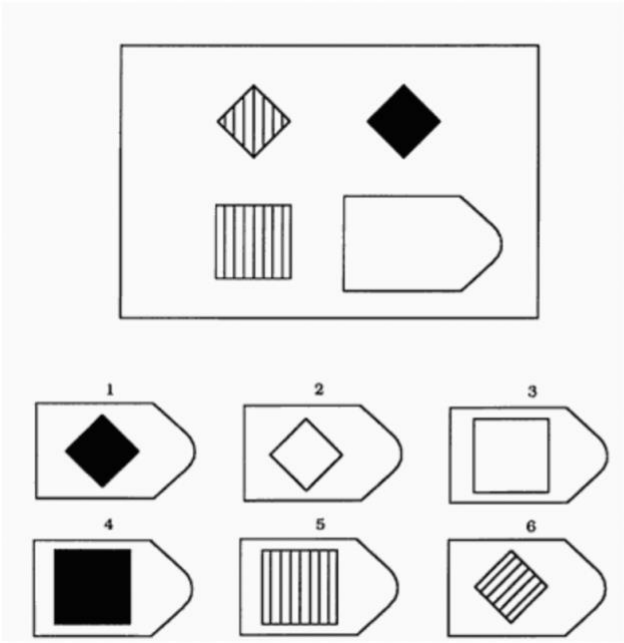
Pattern-Puzzle: Find the right piece!

In each of the following tasks you will see a pattern with a gap.

Below are pieces that fit the size of the gap.

But only **a single piece** completes the pattern perfectly according to one (or more) underlying rule(s)!

Find the correct piece from the ones below and enter the corresponding number as your answer.



In the example pattern shown here, the 4th piece complements the pattern perfectly. From left to right the color or fill of the shapes changes from striped to black and looking from top to bottom from the square shape gets turned (from its tip to laying on one side) - therefore the correct piece must be a black square tilted to lay one its side rather than on its tip.

Therefore, **4** should be entered as the answer!

In the beginning, the patterns are easy and then go on to increase in difficulty.

It is not important to be fast, but to pick the correct piece for each pattern.

Click "Next" to get started!

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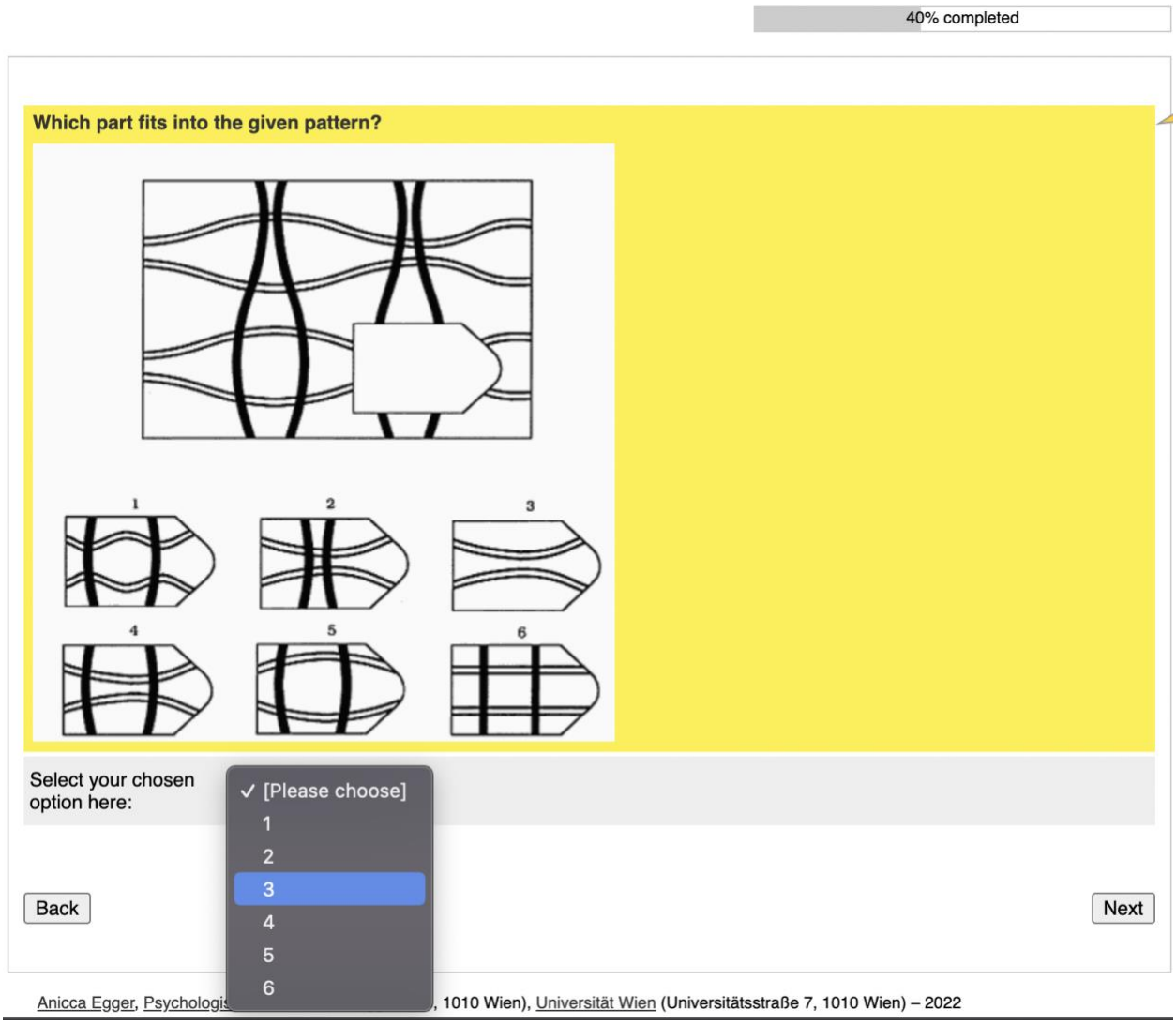

Note: Further items of RSPM not included in English account – see German account below.

80% completed

Please fill in what you agree with

	strongly disagree	somewhat disagree	neither agree, nor disagree	somewhat agree	strongly agree
People who disagree with me are usually wrong.	○	○	○	○	○
Having multiple perspectives on an issue is usually desirable.	○	○	○	○	○
There is a single correct way to do most things.	○	○	○	○	○
Diversity of opinion and background is valuable in any group or organization.	○	○	○	○	○
It is important to be open to different points of view.	○	○	○	○	○
I am a “my way or the highway” type of person.	○	○	○	○	○
There are often many different acceptable ways to solve a problem.	○	○	○	○	○
I consider myself to be very open-minded.	○	○	○	○	○
Different points of views should be encouraged.	○	○	○	○	○
People who are very different from us can be dangerous.	○	○	○	○	○
I am “set in my ways.”	○	○	○	○	○

Back

Next

87% completed

Do you have any current psychologically relevant diagnoses?

- [x] **one (or more) current diagnose(s)**
  - [ ] neurodevelopmental disorder (e.g. ADHD, Autism, ...)
  - [ ] Depressive disorder
  - [ ] Anxiety disorder
  - [ ] bipolare and/or related disorder
  - [ ] not named here *
- [ ] no current diagnosis/diagnoses
- [ ] prefer not to say

*** further details**

Your information is particularly relevant with regard to the diagnoses mentioned above.

If you want to provide further details (e.g. further diagnoses, medication) here, these will help with the more in-depth interpretation of the results:

Would you like to add anything to this survey or to extend on your answers?

Did you notice anything negative while taking part in this survey? Were the questions not clear at one point or did you feel uncomfortable answering them? Please write down a few key points.

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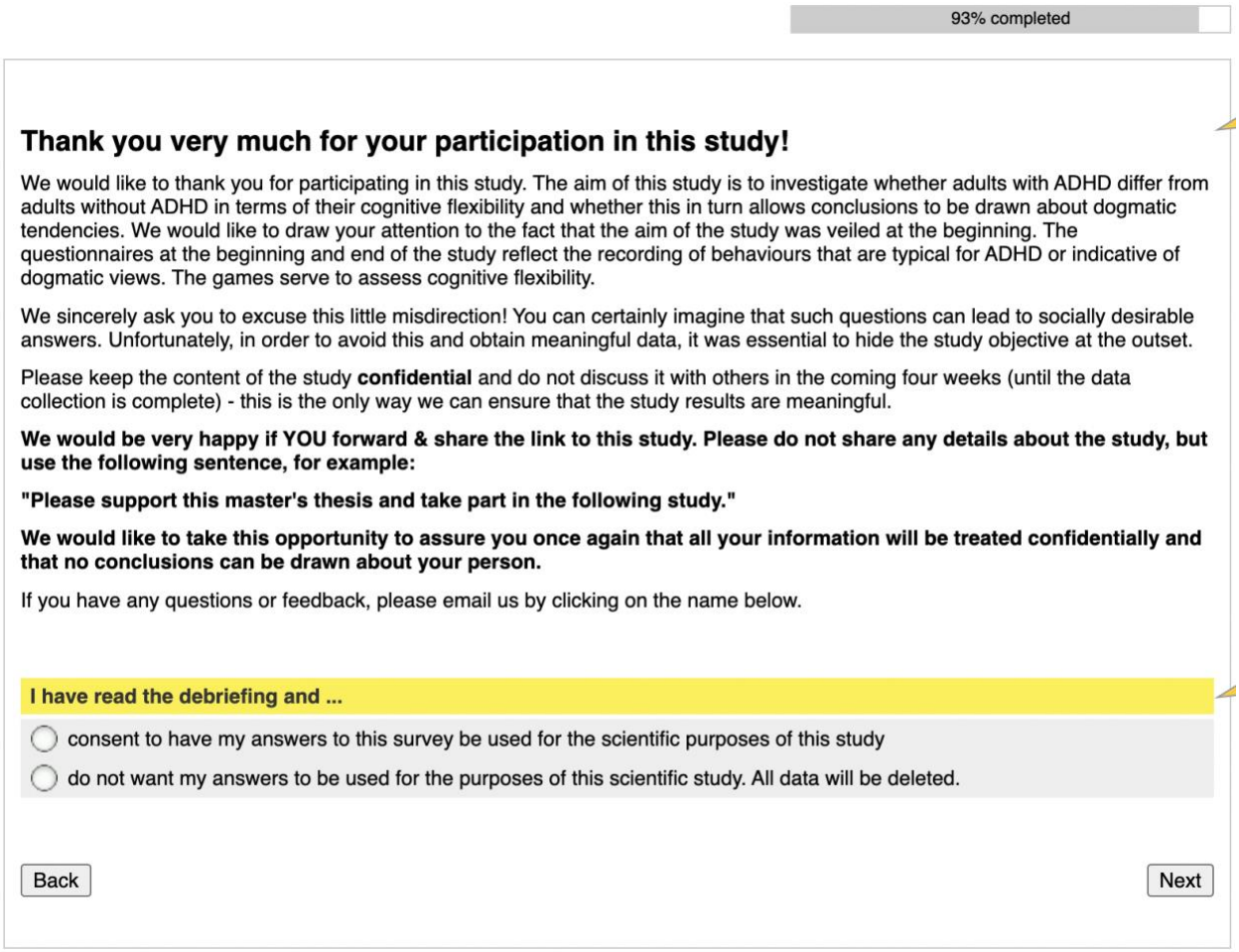


Page-by-page-account of survey, in German:

Lieber Teilnehmer, liebe Teilnehmerin,

vielen Dank, dass Sie sich bereit erklären, an dieser Studie, welche Teil meiner Master-Arbeit ist (Anicca Egger), unter der Betreuung von Dr. Claus Lamm und Co-Betreuung von Dr. Lei Zhang teilzunehmen. Auf der nächsten Seite erfahren Sie mehr zu Studienziel und Ablauf.

Das Bearbeiten des Fragebogens dauert **ca. 15 Minuten.**

Ihre Angaben werden vertraulich behandelt und nur für wissenschaftliche Zwecke verwendet. Jegliche Angaben werden **anonym** ausgewertet. Die Teilnahme ist freiwillig und kann jederzeit abgebrochen werden.

Vielen Dank für Ihre Teilnahme!

Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

Studienziel

In dieser Studie geht es um Ihre allgemeinen **Verhaltensweisen und Persönlichkeit in Verbindung mit Ihrer Leistung bei kreativen Spielen.** Dazu werden Ihnen zwei Spiele und zwei Fragebögen präsentiert. Das Ziel der Studie ist herauszufinden, **wie diese Spiele von unterschiedlichen Leuten wahrgenommen werden**.

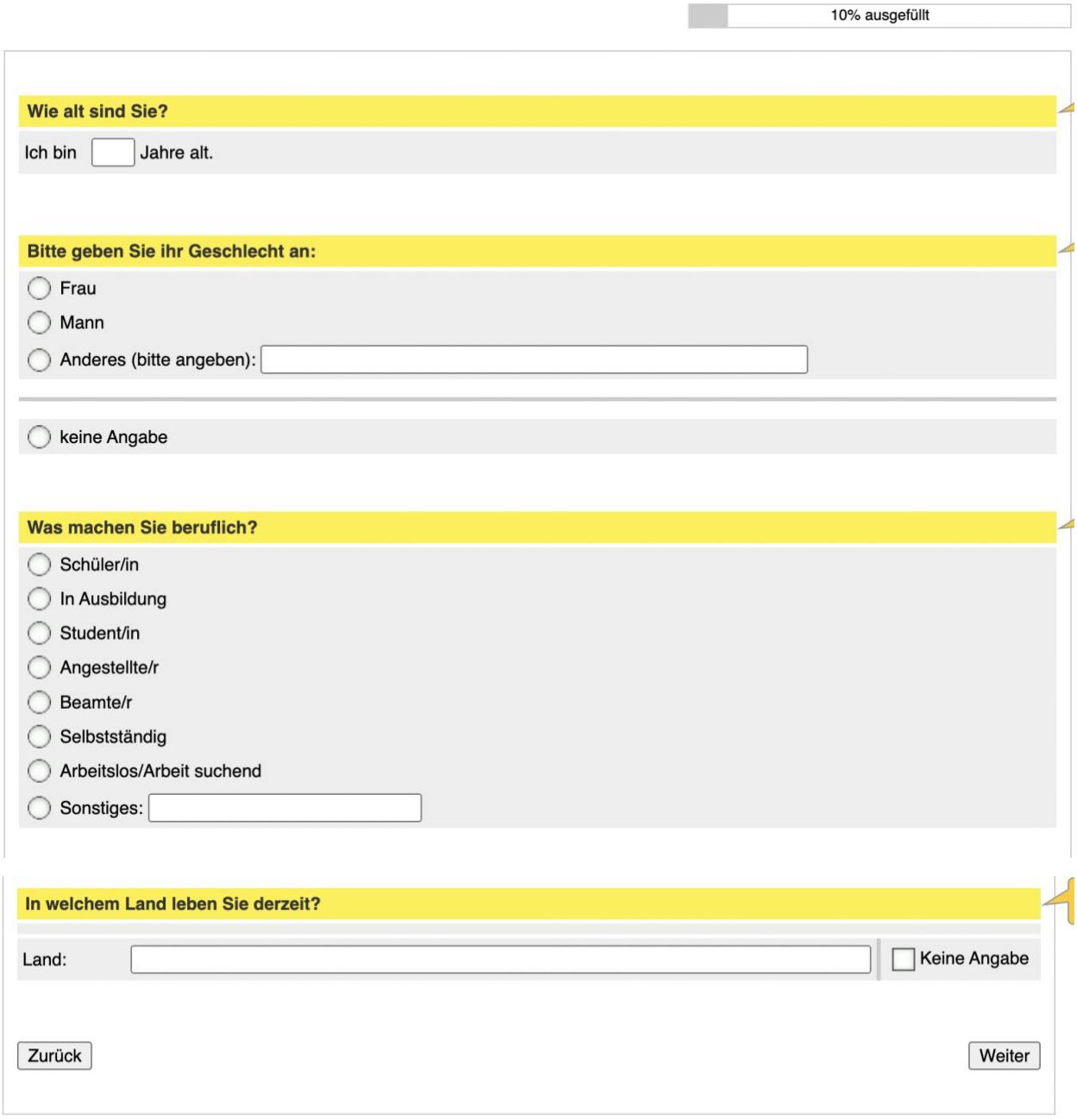
Ablauf

Sie werden nach ein paar generelle demographischen Angaben gefragt werden. Im Anschluss wird Ihnen der erste Fragebogen präsentiert. Diesen können sie ganz einfach durch anklicken der für Sie passendsten Antwortoption beantworten. Danach werden Sie in einem Puzzle-Spiel aufgefordert gezeigte Muster und deren Regeln zu erkennen. Im zweiten Spiel sollen sie sich alternative Benutzungsweisen zweier gezeigter Gegenstände ausdenken. Zum Abschluss folgt ein kurzer Fragebogen zu Ihrer Persönlichkeit und spezifischen demographischen Angaben.

Es werden immer genaue Instruktionen angegeben - bitte lesen Sie sich diese genau durch!

Zurück

Weiter



10% ausgefüllt

Wie alt sind Sie?

Ich bin ____ Jahre alt.

Bitte geben Sie ihr Geschlecht an:

- ○ Frau
- ○ Mann
- ○ Anderes (bitte angeben): ____

- ○ keine Angabe

Was machen Sie beruflich?

- ○ Schüler/in
- ○ In Ausbildung
- ○ Student/in
- ○ Angestellte/r
- ○ Beamte/r
- ○ Selbstständig
- ○ Arbeitslos/Arbeit suchend
- ○ Sonstiges: ____

In welchem Land leben Sie derzeit?

Land: ____ ☐ Keine Angabe

Zurück Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

15% ausgefüllt

Fragebogen zu Gefühlen und Verhaltensweisen:

Sie sehen hier einige Gefühle und Verhaltensweisen aufgeführt, die von Erwachsenen manchmal gezeigt werden.

Lesen Sie bitte jede Aussage sorgfältig durch und entscheiden Sie, wie sehr die Aussage Sie beschreibt oder wie oft die Verhaltensweise oder das Problem in letzter Zeit auftrat.

Kreuzen Sie bitte für jede Aussage diejenige Häufigkeit an, die Ihrer Einschätzung entspricht.

Bei Aussagen, die Sie als schwierig zu beurteilen empfinden, entscheiden Sie sich für die am ehesten passende Antwort.

In letzter Zeit traf das ... zu.	überhaupt nicht/nie	ein wenig/ manchmal	stark/ häufig	sehr stark/ sehr häufig
Ich unterbreche andere beim Sprechen.	○	○	○	○
Ich bin immer auf Achse, wie von einem Motor getrieben.	○	○	○	○
Ich bin schlecht organisiert.	○	○	○	○
Ich kann nur schwer für sehr lange Zeit an einem Platz bleiben.	○	○	○	○
Ich habe Schwierigkeiten, mehrere Dinge gleichzeitig im Blick zu behalten.	○	○	○	○
Ich bin schnell gelangweilt.	○	○	○	○
Ich bin leicht aufbrausend.	○	○	○	○
Ich habe noch immer Wutanfälle.	○	○	○	○
Ich vermeide neue Herausforderungen mangels Vertrauen in meine Fähigkeiten.	○	○	○	○
Ich suche mir schnelle, aufregende Aktivitäten.	○	○	○	○
Ich fühle mich innerlich unruhig, selbst wenn ich still sitze.	○	○	○	○

Dinge, die ich sehe oder höre, lenken mich von dem ab, was ich gerade tue.	○	○	○	○
Viele Dinge können mich leicht irritieren.	○	○	○	○
Ich bleibe mit meinen Leistungen hinter meinen Fähigkeiten zurück.	○	○	○	○
Ich bin übermäßig selbstkritisch.	○	○	○	○
Nach außen hin verhalte ich mich normal, aber innerlich bin ich unsicher.	○	○	○	○
Ich erledige Angelegenheiten nicht, außer unter äußerst hohem Termindruck.	○	○	○	○
Ich habe Schwierigkeiten mit einer Aufgabe zu beginnen.	○	○	○	○
Ich mische mich in die Aktivitäten anderer Leute ein.	○	○	○	○
Meine Launen sind nicht vorhersehbar.	○	○	○	○
Ich bin bei alltäglichen Aktivitäten geistig abwesend.	○	○	○	○
Manchmal bin ich mit etwas so beschäftigt, dass ich nichts um mich herum mitbekomme; bei anderen Gelegenheiten werde ich von allem abgelenkt.	○	○	○	○
Ich neige dazu, herumzurutschen oder zu zappeln.	○	○	○	○
Ich kann mich nicht konzentrieren, außer es ist wirklich interessant.	○	○	○	○

Ich wünschte ich hätte größeres Vertrauen in meine Fähigkeiten.	○	○	○	○
Mein Versagen in der Vergangenheit macht es mir schwer, an mich selbst zu glauben.	○	○	○	○

Zurück Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

20% ausgefüllt

Alternative Benutzungsarten für alltägliche Gegenstände ausdenken:

In der folgenden Aufgabe werden Sie gebeten so viele Arten der Benutzung der hier präsentierten Gegenstände wie nur möglich zu nennen. Es werden insgesamt **zwei Gegenstände** hintereinander präsentiert.

Sie haben pro Gegenstand **zwei Minuten** Zeit, um **möglichst viele Benutzungsarten** aufzulisten. Es gibt keine falschen Antworten!

So könnte ein Gegenstand aussehen: **Autoreifen**

Antworten:

1. fürs Auto
2. Schaukel (mit Seil auf Ast)
3. ...

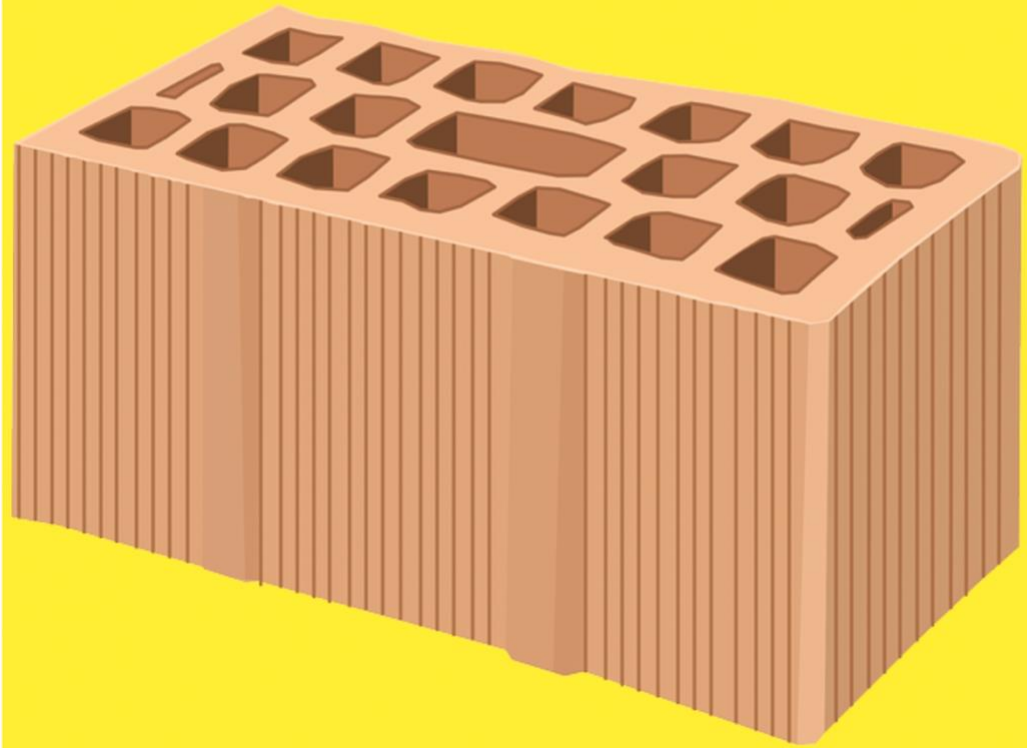
Nachdem Sie auf "Weiter" klicken geht es mit dem ersten Gegenstand auch schon los!

Zurück Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

25% ausgefüllt

Nennen Sie so viele Arten der Benutzung eine Ziegelsteins, wie nur möglich.



Antworten hier eintragen:

1:36

Zurück Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

30% ausgefüllt

Nennen Sie so viele Arten der Benutzung einer Zeitung, wie nur möglich.

Antworten hier eintragen:

1:33

Zurück

Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

35% ausgefüllt

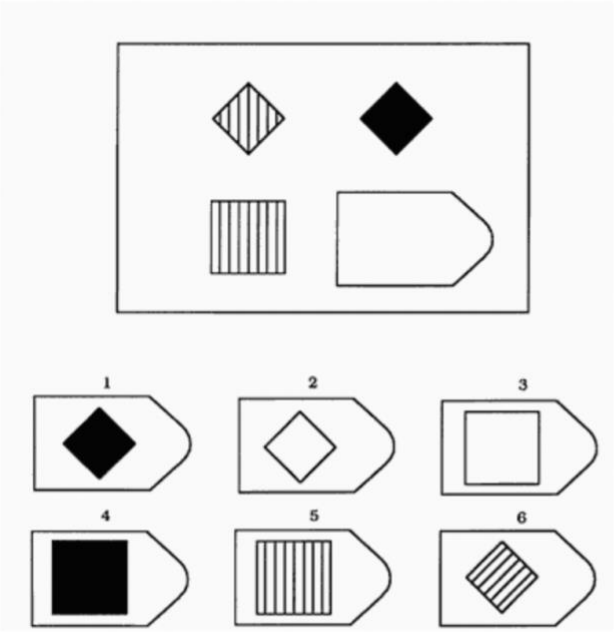
Teilstück-Puzzle: Finde das richtige Teilstück!

In den folgenden Aufgaben sehen Sie jeweils ein Muster (geometrische Reihe) mit einer Lücke rechts unten.

Darunter sind Teilstücke die der Größe nach in die Lücke passen.

Aber nur **ein einziges Teilstück** ergänzt das Muster perfekt nach einer (oder mehrerer) dahinter liegenden Regel(n) !

Finden Sie jeweils das richtige Teilstück und geben Sie Nummerierung als Antwort an.



Im hier gezeigten Beispielmuster ergänzt Teilstück 4 das Muster perfekt. Die Farbe oder Füllung der Formen wird von links nach rechts schwarz und die Form von oben nach unten einmal gedreht - daher muss auch das richtige Teilstück aus einem schwarz gefüllten, gedrehten Viereck bestehen.

Es soll daher **4** als Antwort eingetragen werden!

Am Anfang sind die Muster einfach und werden dann immer schwieriger.

Es kommt nicht darauf an schnell zu sein, sondern möglichst viele Aufgaben richtig zu lösen.

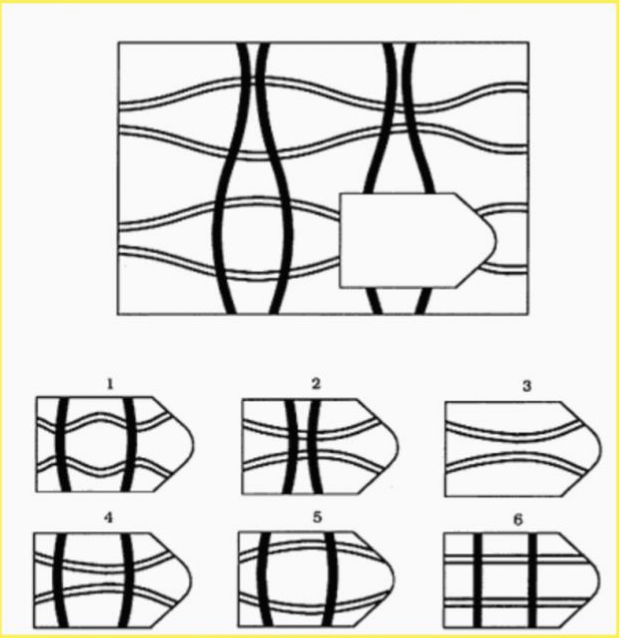
Wenn Sie auf "Weiter" klicken, geht es los!

Zurück Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

40% ausgefüllt

Welches Teilstück ergänzt das Muster richtig?



Gewählte Nummer bitte hier eintragen:

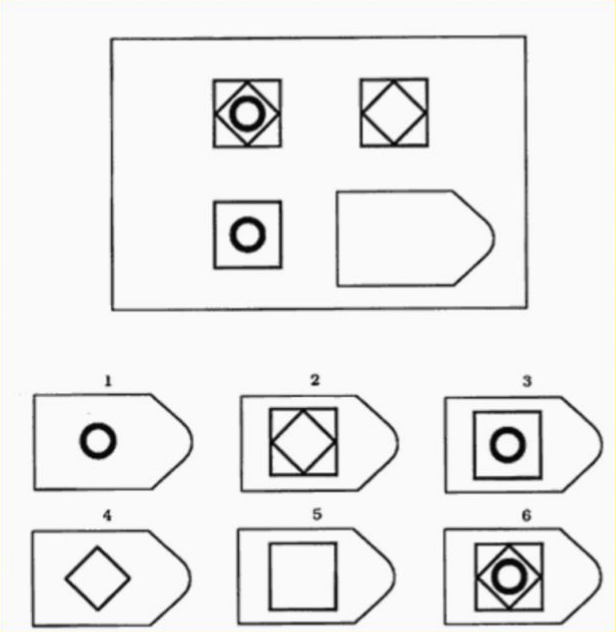
[Bitte auswählen]
1
2
3
4
5
6

Zurück

Weiter

45% ausgefüllt

Welches Teilstück ergänzt das Muster richtig?



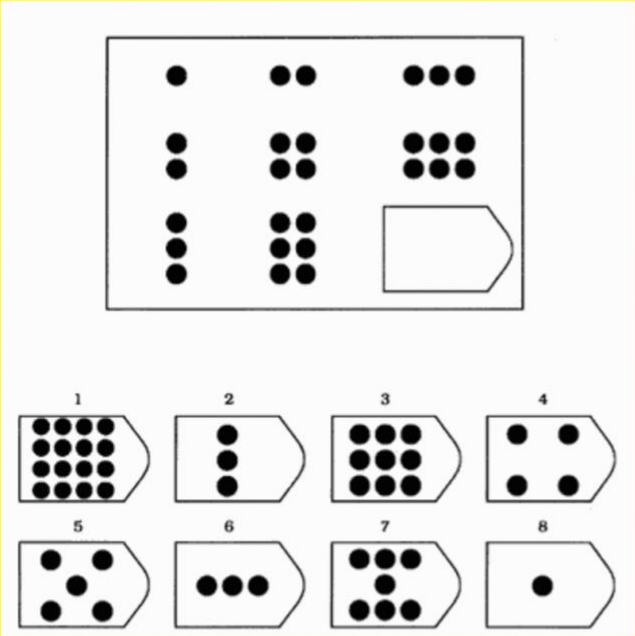
Gewählte Nummer bitte hier eintragen: [Bitte auswählen]

Zurück Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

50% ausgefüllt

Welches Teilstück ergänzt das Muster richtig?



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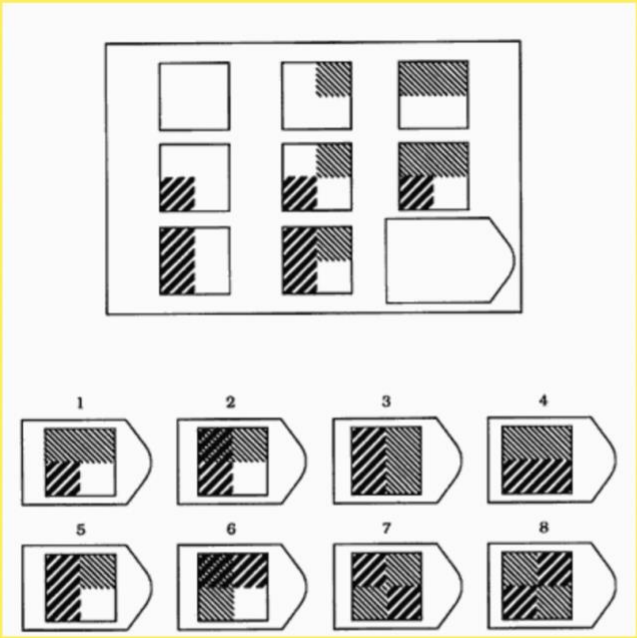
Zurück Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

55% ausgefüllt

Welches Teilstück ergänzt das Muster richtig?



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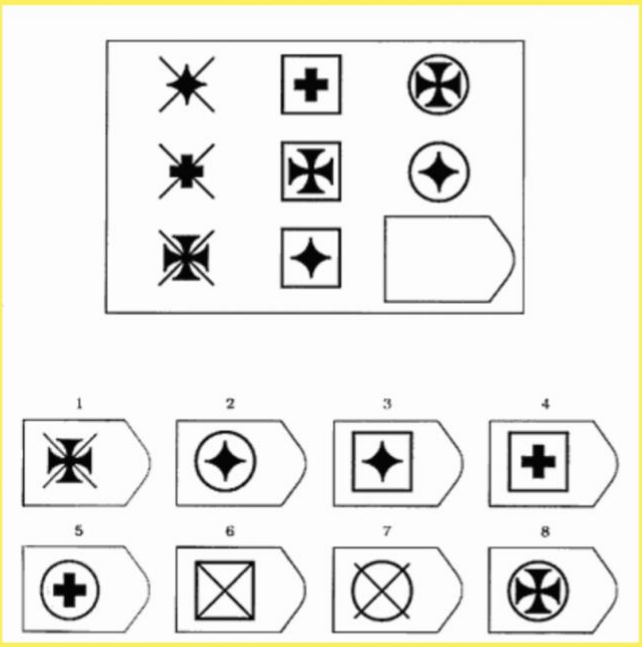
Zurück Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

60% ausgefüllt

Welches Teilstück ergänzt das Muster richtig?



Gewählte Nummer bitte hier eintragen: [Bitte auswählen]

Zurück Weiter

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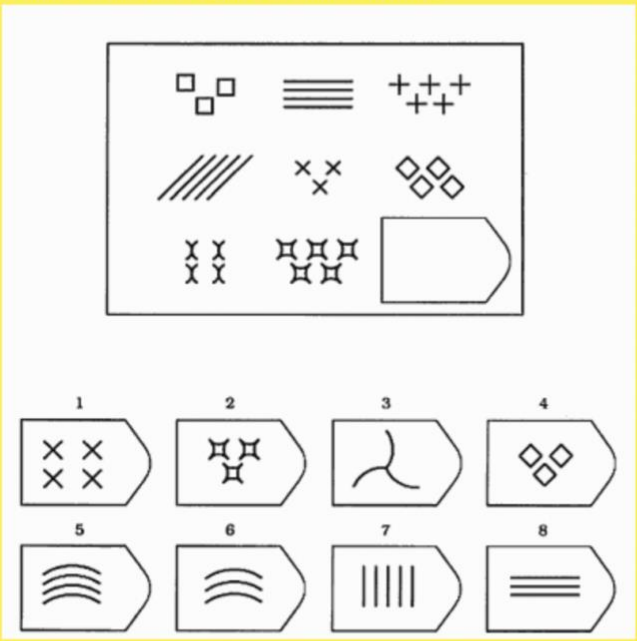
65% ausgefüllt

Welches Teilstück ergänzt das Muster richtig?



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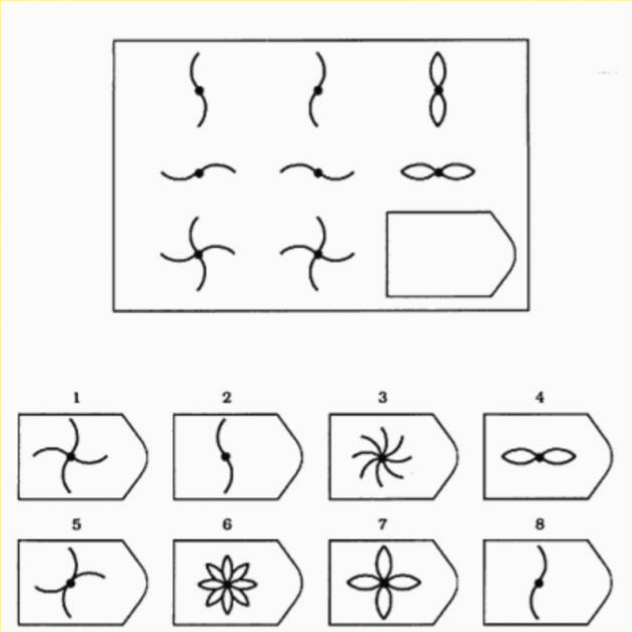
Zurück

Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

70% ausgefüllt

Welches Teilstück ergänzt das Muster richtig?



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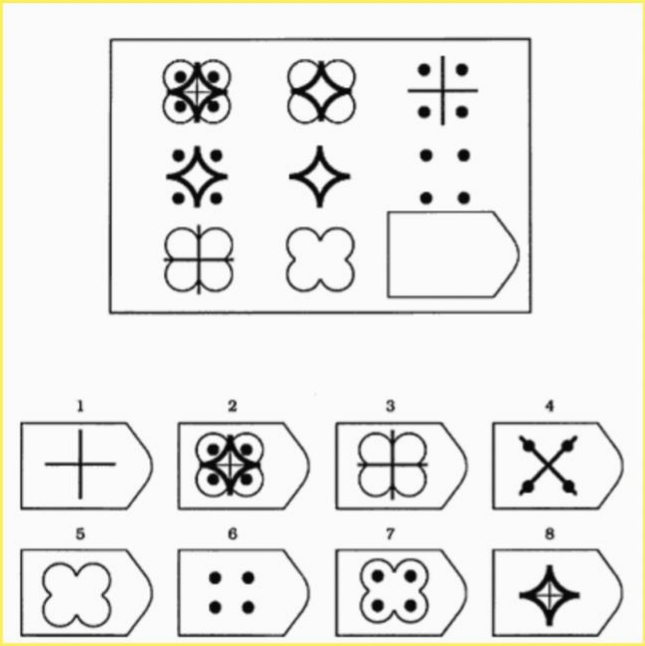
Zurück Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

75% ausgefüllt

Welches Teilstück ergänzt das Muster richtig?



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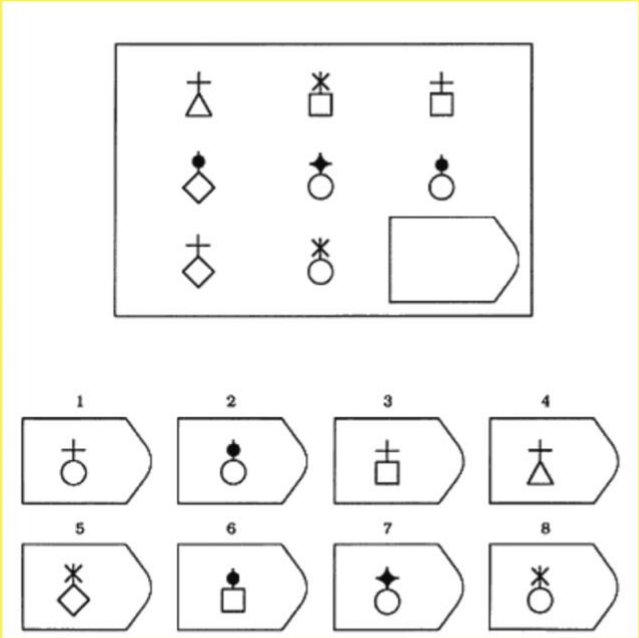
Zurück

Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

80% ausgefüllt

Welches Teilstück ergänzt das Muster richtig?



Gewählte Nummer bitte hier eintragen: [Bitte auswählen]

Zurück

Weiter

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022

85% ausgefüllt

Bitte geben Sie an wie sehr Sie den folgenden Aussagen zustimmen.

	stimme nicht zu	stimme eher nicht zu	teils-teils	stimme eher zu	stimme zu
Leute die mit mir nicht übereinstimmen, liegen normalerweise falsch.	○	○	○	○	○
Viele Perspektiven auf eine Angelegenheit zu haben ist üblicherweise erwünscht.	○	○	○	○	○
Es gibt einen bestimmten richtigen Weg um die meisten Dinge zu erledigen.	○	○	○	○	○
Unterschiedliche Meinungen und Herkünfte sind wertvoll in jeder Gruppe und Organisation.	○	○	○	○	○
Es ist wichtig für unterschiedliche Meinungen offen zu sein.	○	○	◉	○	○
Ich bin jemand zu dem die Devise „Entweder so oder gar nicht./ Entweder du tust, was ich sage, oder du kannst gehen!“ passt.	○	○	○	○	○
Es gibt oft mehrere mögliche und geeignete Wege ein Problem zu lösen.	○	○	◉	○	○
Ich sehe mich selbst als sehr aufgeschlossen.	○	○	○	○	○
Unterschiedliche Meinungen sollten angeregt/ermutigt werden.	○	○	○	○	○
Menschen die sich stark von uns unterscheiden, können gefährlich sein.	○	○	○	◉	○
Ich bin festgefahren in meinen Gewohnheiten.	○	○	○	◉	○

Zurück

Weiter

90% ausgefüllt

Haben Sie aktuell geltende psychologisch relevante Diagnosen ?

- [ ] **eine (oder mehr) aktuelle Diagnose(n)**
- [ ] keine aktuelle(n) Diagnose(n)
- [ ] keine Antwort

*** weitere Details**

Ihre Angaben sind besonders in Hinblick auf die oben genannten Diagnosen relevant.

Wenn Sie weitere Details (z.B. Diagnosen, Medikamente) hier angeben wollen, helfen Sie damit bei der tiefergehenden Ergebnisinterpretation:

Möchten Sie zu dieser Befragung oder zum besseren Verständnis Ihrer Antworten noch etwas anmerken?

Ist Ihnen während der Teilnahme an dieser Befragung etwas negativ aufgefallen? Waren die Fragen an einer Stelle nicht klar oder war Ihnen die Beantwortung unangenehm? Bitte schreiben Sie kurz ein paar Stichworte dazu.

95% ausgefüllt

Vielen herzlichen Dank für Ihre Teilnahme an dieser Studie!

Wir möchten uns bei Ihnen für die Teilnahme and dieser Studie bedanken. Das Ziel dieser Studie ist es zu untersuchen, ob sich erwachsene Menschen mit ADHS von Menschen ohne ADHS in ihrer kognitiven Flexibilität unterscheiden und diese wiederum Rückschlüsse auf dogmatische Tendenzen erlaubt. Wir möchten Sie darauf aufmerksam machen, dass das Ziel der Studie zu Beginn verschleiert wurde. Die Fragebögen zu Beginn und Ende der Studie spiegeln die Erfassung von Verhaltensweisen die typisch für ADHS bzw. von dogmatischen Ansichten sind wider. Die Spiele dienen der Erfassung der kognitiven Flexibilität.

Wir bitten Sie aufrichtig, diese kleine Irreführung zu entschuldigen! Sie können sich sicher vorstellen, dass es bei solchen Fragestellungen zu sozial erwünschten Antworten kommen kann. Um dies zu vermeiden und aussagekräftige Daten zu erhalten, war es leider unumgänglich, das Studienziel zu Beginn zu verbergen.

Bitte behandeln Sie den Inhalt der Studie **vertraulich** und sprechen Sie in den kommenden vier Wochen (bis die Datenerhebung abgeschlossen ist) nicht mit Anderen darüber - nur so können wir gewährleisten, dass die Studienergebnisse aussagekräftig sind.

Wir freuen uns sehr, wenn SIE den Link für diese Studie weitergeben & teilen. Bitte teilen Sie dabei keine Details zur Studie, sondern benutzen Sie z.B. den folgenden Satz:

"Bitte unterstütze diese Master-Arbeit und nimm an der folgenden Studie teil."

Wir möchten Ihnen an dieser Stelle noch einmal versichern, dass all Ihre Angaben vertraulich behandelt werden und dass keine Rückschlüsse auf Ihre Person möglich sind.

Für Fragen und Rückmeldungen schreiben Sie uns gerne per E-Mail, indem Sie den untenstehenden Namen anklicken.

Ich habe das Debriefing gelesen und...

- ◯ erlaube ausdrücklich die Verwendung meiner Angaben zu wissenschaftlichen Zwecken.
- ◯ möchte nicht, dass meine Angaben für wissenschaftliche Zwecke verwendet werden. Alle Angaben werden gelöscht.

Zurück Weiter

Vielen Dank für Ihre Teilnahme!

Ihre Antworten wurden gespeichert, Sie können das Browser-Fenster nun schließen.

Anicca Egger, Psychologische Fakultät (Liebiggasse 5, 1010 Wien), Universität Wien (Universitätsstraße 7, 1010 Wien) – 2022