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Review article

No clear evidence for a positive association between the interpersonal-affective aspects of psychopathy and executive functioning

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ABSTRACT

Common psychopathy rating instruments distinguish between an interpersonal-affective and an antisocial dimension. The suggestion that the interpersonal-affective dimension, often considered to be the core feature of psychopathy, is positively associated with executive functioning is occasionally made in the literature, without reporting objective empirical data. The primary aim of the present paper was to search for empirical studies reporting relevant data, focussing on four aspects of 'cold' executive functioning: inhibition, attentional shifting, working memory, and planning. Eleven published articles were identified, reporting data of 721 individuals from incarcerated and non-incarcerated, male and female, and adult and non-adult samples. Using a heterogeneous set of tests and dependent measures across studies, the inhibition and attentional shifting components were assessed in eight and five studies, respectively; the working memory and planning components each in two studies. A small majority of the studies found positive associations with the different executive functions, although the associations were mostly non-significant. Given the scarcity of studies and the use of heterogeneous populations, tests and statistical analyses, no robust conclusions can be drawn at this stage. Therefore, caution is needed when claiming a positive association between the interpersonal-affective features of psychopathy and executive functioning. Clearly more research is needed to further validate and specify the suggested association.

Contents

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1. Introduction

1.1. Psychopathy and underlying dimensions

Psychopathy is a disorder that is suggested to be characterized by a wide variety of symptoms, such as a lack of empathy and fear, coldheartedness, manipulativeness, impulsivity, and antisocial behaviors, including criminal behavior (Skeem et al., 2011). However, there is still much debate as to which specific symptoms or trait dimensions are key to the psychopathic personality and which of the various extant rating instruments is most useful in predicting crucial outcomes, such as externalizing behaviors in general and criminal behavior in particular (e.g., Skeem et al., 2011).

The most widely used clinical psychopathy rating instrument is the Psychopathy Checklist Revised (PCL-R; Hare, 2003). This instrument consists of an archival analysis supplemented with a 20-item interview protocol, specifically designed for incarcerated criminal samples. The PCL-R contains two distinctive item subsets or moderately correlated factors, with each factor being subdivided into 2 'facets' (Hare, 2003; but see Cook and Michie, 2001). Specifically, Factor 1 is termed the interpersonal-affective scale, containing an interpersonal facet (Facet 1) and an affective facet (Facet 2). Facet 1 involves items related to glibness, grandiose sense of self-worth, pathological lying, and manipulative behavior; Facet 2 contains items reflecting a lack of remorse and guilt, shallow affect, callousness and lack of empathy, and lack of taking responsibility for own actions. Factor 2 is termed the antisocial scale and consists of a lifestyle facet (Facet 3) and an antisocial facet (Facet 4). Facet 3 is related to a need for stimulation, parasitic lifestyle, lack of realistic long-term goals, impulsivity, and irresponsibility. Facet 4 refers to poor behavioral control, early behavioral problems, juvenile delinquency, revocation of conditional release, and criminal versatility. Two other versions of the PCL have been developed: a brief version, the PCL: SV (screening version; Hart et al., 1995) and a Youth Version (PCL:YV; Forth et al, 2003). Next to the PCL, there are a number of other psychopathy scales that are based on self-reports, for use with criminal and non-criminal samples. Examples are the Levenson Self-Report Psychopathy (LSRP) Scales (Levenson et al., 1995), the Psychopathy Personality Inventory (PPI; Lilienfeld and Andrews, 1996), or its revised version (PPI-R; Lilienfeld and Widows, 2005), the Antisocial Process Screening Device (APSD, Frick and Hare, 2001), and the Self-Report Psychopathy Scale-Version III (SRP-III; Williams et al., 2007). Each of these instruments also includes a factor denoting disturbed interpersonal-affective processing and a second one describing antisocial behavioral tendencies, although the exact content of these factors and their external correlates may differ for the different instruments (e.g., see Miller and Lynam, 2012, for an evaluation of the PPI Factor 1). Moreover, in each instrument each factor consists of a number of facets or subscales that are similar to the PCL-R facets (e.g., see Walters et al., 2008, for the four facets resulting from a principal components analysis of the LSRP). In the remainder of this paper, we will use the term 'Factor 1' in a general way to refer to items related to the fearless-dominance/interpersonal-affective factors. Facet 1 is used to refer to the interpersonal aspect of Factor 1; Facet 2 to signify the affective component of this factor. Factor 2 denotes items associated with the impulsive-antisocial behavioral tendencies. One key difference between the factors is that Factor 1 is generally believed to represent a constellation of features relatively unique to psychopathy, while Factor 2 is related to more general antisocial behavior that is not unique to psychopathy (e.g., Hare et al., 1991). In this light, the commonalities and differences between psychopathy and generic antisociality have recently been receiving an increasing amount of attention (Gao and Raine, 2009; Verona et al., 2012; Brazil et al., 2012). Moreover, the distinction between Factors 1 and 2 is also highly relevant in the context of theories describing different etiological pathways to psychopathy, in which one factor is linked to reduced reactivity to negative affect (Factor 1) and the other to poor emotional and behavioral control (Factor 2; e.g., Fowles and Dindo, 2009).

1.2. Psychopathy and executive functioning

Another topic that is becoming increasingly visible in the literature is the link between psychopathy and cognitive functioning. While some researchers have linked psychopathy to specific cognitive dysfunctions, such as attentional processing (e.g., Baskin-Sommers et al., 2012) and reversal learning (e.g., Budhani et al., 2006; Brazil et al., 2013), in recent years there has been a growing interest in a broader range of cognitive functions, often denoted with the umbrella-term 'executive functioning' (EF) (see De Brito and Hodgins, 2009, for an overview). Executive functions refer to a set of higher order cognitive processes that allow an individual to exert control over lower cognitive processes, possibly through a biasing mechanism in the prefrontal brain regions (Alvarez and Emory, 2006; Miller and Cohen, 2001). A large number of processes have been suggested to be part of this set which enable behavioral adaptation to changing environmental demands and the display of goal-directed behavior.

From the many definitions and suggested components of executive functions (see Jurado and Rosselli, 2007, for an overview), we largely adopt the framework proposed by Miyake et al. (2000) in the present paper. Briefly, based on a latent-variable analyses, Miyake et al. suggested that most EF tests call upon three basic functions: (1) inhibition of pre-potent or automatic responses, (2) information monitoring and updating in working memory, and/or (3) mental set shifting. Although extant EF tests almost by definition incorporate many different lower-level processes, which are controlled by the executive function(s), in our review we focused on tests that are relatively 'pure' with respect to the specific executive function involved. With regard to the basic functions proposed by Miyake et al., the go/no-go and Stroop interference tasks are examples of prototypical tests that yield relatively unmixed measures of inhibition (see Lezak, 2004, for a description of these tests, and the other neuropsychological tests mentioned hereafter). The n-back or reversed digit span tasks are relatively pure tests that can be mapped on to the working memory aspect, and the Trail-Making-Part B (TMT-B) test and attentional set-shifting tests (e.g., the Wisconsin Card Sorting Test, WCST; see Eling et al., 2008) are frequently used to examine the shifting component. Importantly, if an EF test was used that potentially involves more than one EF aspect, like the WCST, or (verbal) fluency tasks (e.g., the Controlled Oral Association Task, COWAT), both of which also demand working memory and inhibition capacities next to shifting abilities, we focused on dependent measures from these tasks that are generally believed to primarily tap one specific executive function. For example, the number of perseveration errors from the WCST was used as a