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The evolutionary roots of psychopathy

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ABSTRACT

There is a growing interest in the study of psychopathic traits from an evolutionary framework; however, there is a lack of comprehensive reviews regarding this issue. To address this gap in the literature, the current paper examines the evolutionary roots of psychopathy by reviewing previous research on this topic. Specifically, the potentially adaptive role of psychopathic traits during human evolution through the lifespan is highlighted. Key areas covered include the evolution of the brain ("old brain, new brain" and the emotion–logic lag), emotion regulation, aggression and its potential adaptive function, and emotions specific to psychopathy including anger and shame/dishonor. This paper (mainly in the light of the Adaptive Calibration Model) discusses how psychopathic features can be seen as a useful heritage, especially for people who have grown in harsh psychosocial backgrounds. The implications of an evolutionary approach for the comprehension and treatment of children, youth, and adults with psychopathic traits are suggested, along with directions for future research.

Contents

1. Introduction

Psychopathy is a controversial (e.g., Silk, 2008) yet important psychopathological construct that can be characterized by a set of affective, interpersonal, and behavioral deviant characteristics (Cooke & Michie, 2001; Hare, 2003). Moreover, psychopathy could be seen as a developmental disorder (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007; Lynam & Gudonis, 2005) that gets worse with age (e.g., Kubak & Salekin, 2009; Lee, Salekin, & Iselin, 2010; Lynam, 2010), and becomes less responsive to treatment, which suggests the need for early screening and intervention efforts (Caldwell, McCormick, Wolfe, & Umstead, 2012; Ribeiro da Silva, Rijo, & Salekin, 2013; Salekin, 2002, 2010; Salekin, Tippey, & Allen, 2012).

Some authors highlight that no particular risk factor (genetic, dispositional, neurobiological, neurochemical, neurocognitive, and environmental) has been shown to be exclusive in the etiology and maintenance of

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psychopathic traits. This means, that like other psychiatric conditions, psychopathy is probably a multicausal phenomenon (e.g., DeLisi & Piquero, 2011; Ribeiro da Silva, Rijo, & Salekin, 2012; Viding & Larson, 2010). Other researchers also highlight the importance of an evolutionary approach to explain the development and maintenance of psychopathic traits (Ferguson, 2010; Gilbert, 2005; Glenn, Kuzban, & Raine, 2011; Ribeiro da Silva et al., 2012, 2013; Salekin & Lynam, 2010).

Evolutionary sciences expanded very quickly over the past two decades and, despite some criticism (e.g., Gould, 1991), these models offer a great potential in the comprehension of human nature (Gangestad & Simpson, 2007; Gilbert, 2010; Krebs, 2007). Evolutionary psychology argues that human mind and behavior evolved in response to ancestrally-based problems to the extent that fitness was enhanced. In contemporary environments, some of these traits may or may not be adaptive (Gangestad & Simpson, 2007; Gilbert, 2009, 2010; Nairne & Pandeirada, 2010; Tooby & Cosmides, 1990). Evolutionary psychology is an adaptationist approach (i.e., a method for discriminating which features are adaptations and which are likely by-products of selection), being far from biological determinism, since it does not ignore the tremendous influence of culture and social environment (Gangestad & Simpson, 2007; Gilbert, 2009, 2010; Krebs, 2007). In this sense, psychopathy can be understood not exclusively as a psychopathological disorder, but also as an adaptive strategy to deal with hostile psychosocial environments or as a strategy that is based on traits and tradeoffs (Del Giudice, 2014; Del Giudice & Ellis, in press; Del Giudice, Ellis, & Shirtcliff, 2011; Del Giudice, Ellis, & Shirtcliff, 2013; Ellis, Del Giudice, & Shirtcliff, 2013; Ferguson, 2010; Gilbert, 2005; Glenn et al ., 2011; Mealey, 1995; Ribeiro da Silva et al., 2012, 2013; Salekin & Lynam, 2010). However, we must stress that an adaptive response, in an evolutionary point of view, does not necessarily mean psychological well-being or socially valued outcomes. Moreover, the fact that children can adapt to harsh rearing environments or adopt a strategy that is not communal, obviously, does not imply that such conditions should be passively accepted as inevitable facts of life (Del Giudice et al., 2011).

This paper addresses the insights of Evolutionary Theory in explaining the origin and development of psychopathic traits during evolution, reviewing data since the origin and evolution of species to the most recent and accurate research studies. Although there are different developmental pathways that probably lead to psychopathy, this paper focuses mainly on psychopathic subjects who have grown in harsh psychosocial backgrounds. Implications of this theoretical understanding for the comprehension and treatment of psychopathy will be outlined.

2. The human brain

2.1. Evolution, brain and attachment

At birth, humans are neurobiologically immature, being neurons designed to be reactive and change in response to external and internal environments (Perry, Pollard, Blakley, Baker, & Vigilante, 1995). The immaturity of the newborn requires extended maternal care which, at the same time, places the developing brain in a unique mother–infant social context (Bowlby, 1969; Gilbert, 2010; Keverne & Curley, 2008; Linden, 2007, Wang, 2005). For the developing infant, the mother (or a significant attachment figure) provides the most significant environmental influence, shaping brain development by producing long-term epigenetic modifications (non-heritable) to neural and behavioral phenotypes (Bird, 2007; Gilbert, 2005, 2010; Jablonka & Lamb, 2005; Keverne & Curley, 2008; Tollefsbol, 2010; Zhang & Meaney, 2010).

Genetic and epigenetic inheritance (ways of providing variance) is complex and inter-dependent, and their interactions are central to human evolution and behavior (Jablonka & Lamb, 2005; Tollefsbol, 2010; Zhang & Meaney, 2010). In this sense, some authors argue that psychopathy is actually an extreme version of some personality traits, which are affected by genes triggered in early hostile or resource limited environments (Glenn et al., 2011; Salekin, Leistico, Trobst, Schrum, & Lochman, 2005). In a different (evolutionary) perspective, other authors argue that psychopathy exists and is adaptive at a low frequency (thrive by exploiting others) and represents a shift to a "fast" life-history strategy (focused on mating rather than parental efforts, on gaining immediate rather than long term advantages) that can be beneficial to the individual especially in some particular harshly contexts (Del Giudice et al., 2011, 2013; Ellis et al., 2013; Glenn et al., 2011, Mealey, 1995). In fact, the systematic association between toxic experiences in infancy and an increased psychopathic response in adulthood is shown in several studies (e.g., Gao, Raine, Chan, Venables, & Mednick, 2010; Salekin & Lochman, 2008; Saltaris, 2002). In summary, psychopathy seems to be more prevalent in specific rearing scenarios, probably because genes associated with it may be more advantageous in those particular environments (Del Giudice et al., 2011, 2013; Ellis et al., 2013; Glenn et al., 2011; Salekin et al., 2005).

2.2. Old brain, new brain: the emotion–logic lag

Darwin (1859/2009), on his emblematic work *On The Origin Of Species*, points out that evolution cannot go back, what explains why all species share the same body systems (e.g., digestive, cardiovascular), and all brains have the same basic functions.

Neurobiologically, beyond the neocortex (exclusive to mammals) and *corpus callosum* (exclusive to placental mammals), the human brain contains all of the parts of simpler brains (Striedter, 2005), i.e., ancient systems that may no longer serve the purposes for which they evolved (Gilbert, 2010; Linden, 2007).

According to MacLean (1990), human brains can be divided into three parts, which constitutes the "Triune Brain": a) the "reptilian brain" (related to the brainstem and cerebellum); b) the "paleomammalian brain" (related to the limbic system); and c) the "neomammalian brain" (related to the neocortex). The first two components represent "old brain" parts, while the last one represents "new brain" areas (Gilbert, 2005, 2009, 2010; MacLean, 1990).

Humans share the so called "old brain" (more primitive, linked to reptilian strategies) with many other animals. The "reptilian" component controls our motives and instinctive behavior (e.g., sex, aggression, power), even in deep sleep (Gilbert, 2009, 2010; MacLean, 1990). These interests in defending, reproducing, and acquiring resources cannot be classified as bad or good, because, to some extent, they are fundamental to self-preservation/survival and to gene-preservation/reproduction across generations (Gilbert, 2009, 2010, MacLean, 1990). So, we can assert that humans have a "reptilian" brain, filled with ancestral memories that evolved over millions of years. However this "reptilian" brain is not deleted; actually it is in charge of our more basic processes and emotions, i.e., our most primitive instincts of survival and reproduction (Gilbert, 2009, 2010; MacLean, 1990).

Our "old brain" also contains a "paleomammalian" component that appeared and evolved with the first mammals about 120 million years ago. This area facilitates care-eliciting and care-giving, and is extremely important for the survival of the immature newborn, especially in the case of human beings (Cracraft & Donoghue, 2004; de Duve, 2002; Gilbert, 2010; Keverne & Curley, 2008; Linden, 2007; MacLean, 1990; Wang, 2005). The "paleomammalian brain" is also responsible for enhancing emotion, motivation, learning, and memory; and gives more flexibility to behavior (MacLean, 1990). Shortly, from an evolutionary point of view, our "old brain" emotions, motives and desires (related to both "reptilian" and "paleomammalian" brain) were and continue to be crucial to human evolution (Gilbert, 2005, 2009, 2010, MacLean, 1990). These "old brain" regions are linked to "new brain" areas ("neomammalian brain"), which give us unique abilities, like observe, reflect, plan, think, communicate, fantasize, play, become self-aware, and form a self-identity (Gilbert, 2009, 2010; MacLean, 1990).

As Damasio (1999, 2006) highlights, the conscious mind results from the fluid articulation between several brain areas, and many psychological problems arise in the way our "old" and "new" brain interact.