



Review article

Reciprocal effects between dominance and anger: A systematic review



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ABSTRACT

Dominance and high status are directly associated with perception of angry expressions. However, studies that have sought to empirically assess the causal mechanisms between these constructs are still relatively scarce. Moreover, several variables can influence and be influenced by both anger and dominance, increasing the complexity of synthesizing the findings related to the association between these agonistic behaviors. We conducted a systematic review in five electronic databases. A total of 207 potentially relevant publications were identified and screened. Of those, 20 articles were found eligible for detailed review, with 26 empirical studies. All reviewed studies reported an association between dominance and anger. Social status and dominance have a direct effect on the perception of anger. In turn, the perception of anger has a consistent effect on attributions of dominance for those who express this emotion. There are mutual effects between dominance and anger, which, if recurring and positively feedback-regulated, at least in perceptual terms, can lead to the establishment and maintenance of dominance hierarchies in social groups.

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1. Introduction

Hostile interactions are critical for the survival of primates and other mammals (Buss, 2008; de Almeida et al., 2015; Honess and Marin, 2006). Dominance is an agonistic behavior that has a direct

impact on the organization of social groups and on interpersonal relationships (Chiao, 2010; Johnson et al., 2012). This behavioral pattern can be defined as a type of social relationship based on control of both the behavior of hierarchically subordinate individuals and of valuable resources (Buss, 2008; Chiao et al., 2009). Besides, dominance hierarchies determine the order of access to resources, reducing energy expenditure and damage caused by intraspecific contests (Arregi et al., 2006; Drews, 1993; Kaufmann, 1983). In humans, dominance drive and pursuit of high social status are conceptually similar to power motivation, i.e., control of valuable resources (Anderson and Galinsky, 2006; Ridgeway and Diekmann, 1989; Salvador, 2005). However, the social hierarchy is subject to change every time that dominance is challenged by a subordinate

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(Arregi et al., 2006; Campbell, 1999; Marsh et al., 2009). Perception of threat to the status of a dominant individual induces the manifestation of greater aggressiveness against the one who made the assault, either as a lower-ranking individual or as an external intruder (Drews, 1993; Sowards et al., 2003). Although the behavioral and physiological characteristics of power motivation and dominance are frequently associated with the expression of some emotions in humans, the relationship between these variables is not yet completely understood.

Dominance interaction does not only apply to physical aggression, since it also includes the display of threats, as well as other strategies for conflict resolution (Johnson et al., 2012; Ridgeway, 1987). Expressions of anger are often interpreted as a threat signals (Coccaro et al., 2007; Hansen and Hansen, 1988; Hermans et al., 2008; Hess et al., 2009; Öhman et al., 2001) and, in general terms, threat displays exert a key role in establishing and maintaining the dominance hierarchy (Buss, 2008). Anger is considered a basic emotion (Ekman, 1992; Izard, 2007) that can be broadly defined as an emotional state that ranges from mild irritation to rage, often with a feeling of hostility toward someone and an intent to cause damage (Berkowitz and Harmon-Jones, 2004; Carver and Harmon-Jones, 2009; Frijda, 1986; Ramírez and Andreu, 2006). In turn, anger expression is a behavioral response to angry feelings, ranging from suppression of anger to its explicit expression toward someone or something, primarily being facially characterized by frowning (Deffenbacher et al., 1996; Hess et al., 2009; Öhman et al., 2001; Tipples et al., 2002). In healthy persons, anger is triggered when a significant goal is frustrated by an external agent's improper action (Berkowitz and Harmon-Jones, 2004; Levine, 1996, 1995). Several cultural and physiological characteristics directly influence the expression of this emotion. Additionally, behavioral reactions of anger are commonly associated with hostility, impulsivity and aggression (Archer and Webb, 2006; Buss and Perry, 1992; Hwang et al., 2016; Sánchez-Martín et al., 2011). That is, angry individuals are more likely to show aggressive behaviors, which, in turn, is also a decisive factor for dominance in natural environment (Archer, 2006; Carré et al., 2013; Johnson et al., 2007; Mazur and Booth, 1998).

Indeed, several anger-related characteristics are directly or indirectly associated with dominance and power pursuit (Archer and Webb, 2006; Peterson and Harmon-Jones, 2012; Sowards and Sowards, 2002; Shariff and Tracy, 2011). Regardless of social status, people expressing anger are often perceived as more dominant than when they express other emotions or are in neutral state (Archer and Webb, 2006; Hareli et al., 2009; Knutson, 1996; Marsh et al., 2005; Tiedens, 2001; Tiedens et al., 2000). In addition, neurobiological features typically seen in dominance drives are equally common in situations of anger expression. Anger experience and dominance motivation are both characterized by a reduction of top-down control and an increase in bottom-up pattern systems, i.e., enhancing amygdala function and impairing areas of prefrontal cortex (PFC) responsible for impulse control, such as orbitofrontal cortex (OFC), ventromedial PFC (vmPFC), and anterior cingulate cortex (ACC) (Beaver et al., 2008; Coccaro et al., 2007; de Almeida et al., 2015). Autonomically, steroid hormones can affect the expression of anger (Carver and Harmon-Jones, 2009; Peterson and Harmon-Jones, 2012; van Honk et al., 1999; Wirth et al., 2007), as well as the occurrence of dominant and competitive behaviors (Mazur and Booth, 1998; Mehta et al., 2008). Even though the effects of dominance and anger are well known to affect human social interaction individually, empirical studies on a possible causal relationship between these variables are still scarce.

Aggressiveness and violence have important implications for living in social groups, yet many of their natural and emotional determinants are not completely known. Understanding the motivations that underlie behaviors with potential deleterious con-

sequences is crucial to avoiding significant social impairments. Several variables can influence and be influenced by both anger and dominance. Thus, the importance of reviewing the scientific literature, so that we can more deeply understand these patterns of agonistic behaviors, becomes evident. With this in mind, we conducted a systematic review of empirical studies on the relationship between dominance and anger. Therefore, this review sought to answer four questions: I) Is there a relationship between dominance and anger? II) Does dominance have a direct effect on anger? III) Does anger have a direct effect on dominance? IV) What are the environmental and biological factors that determine the relationship between these variables? Given the multifactorial nature of the variables, this review focuses on data from adult and healthy human participants. It was expected that, due to this control of the variables, such data could enable a more concise and productive discussion on the relationship between dominance and anger in humans.

2. Method

The following electronic databases were searched for relevant studies in November 2015: Scopus, Web of Science, PsycNET (APA), PubMed (Medline), and Scielo.org (Scientific Electronic Library Online). Articles published between 1990 and November 2014 were sampled using the following search strategy: ((anger [Title/Abstract] OR angry [Title/Abstract]) AND ("dominance motives" [Title/Abstract] OR "dominance motivation" [Title/Abstract] OR "Social dominance"[Title/Abstract] OR "social hierarchy"[Title/Abstract] OR "dominance hierarchy"[Title/Abstract] OR subordination [Title/Abstract] OR "dominant behavior" [Title/Abstract] OR "high-status people" [Title/Abstract]) NOT (disorder [Title/Abstract] OR pathology [Title/Abstract] OR pathological [Title/Abstract] OR symptoms[Title/Abstract])) (see Fig. 1 for details).

The 207 publications originally identified were submitted to a screening procedure to assess their adequacy based on inclusion and exclusion criteria, as well as assessing the methodological quality of studies. The screening procedure was simultaneously and independently carried out by two reviewers previously trained for the task. The following items were used as inclusion criteria: (1) type of publication – peer reviewed articles based on empirical research and published in scientific journals; (2) aim of the study – the main objectives, or at least the secondary objectives, should be related to dominance and anger; (3) subjects – postpubertal healthy humans; (4) period of publication – articles published from 1990 to 2015; and (5) language – articles published in English, Spanish or Portuguese. Then, non-relevant publications for this review were excluded by the following criteria: (1) clinical variables – studies focusing on diseases and/or pathological behaviors and on the effects of health interventions and clinical treatments; (2) psychoactive substances – studies on effects of psychoactive substances; and (3) social discrimination – studies on prejudice and social discrimination.

Ultimately, 20 articles were reviewed and the concordance rate between reviewers was 91.4%, calculated after exclusion of duplicated articles (Fig. 1). In the cases of discrepancies, the opinion of a third reviewer was requested. Reviewed articles were organized by author, publication year, sample size, methods and design of the study, variables, and main results (Table 1).

3. Results and discussion

The search of five databases resulted in identifying 207 articles, of which 20 publications met the inclusion and exclusion criteria, as illustrated in Fig. 1. These 20 publications, corresponding

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