



Aggressive behavior after social exclusion is linked with the spontaneous initiation of more action-oriented coping immediately following the exclusion episode

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ABSTRACT

The experience of social exclusion may provoke prosocial, avoidant, or antisocial (aggressive) behaviors. Multiple situational and personal factors seem to affect which course of action people adopt, and to which degree. The present study examined the relevance of the most spontaneous initiation of more passive, avoidant (disengagement) or action-oriented (engagement) coping immediately following a social exclusion experience to subsequent aggressive behavior. In a sample of $n = 85$ healthy female students, an ostensible discussion group excluded (versus included) the participant on the basis of her personal traits and preferences. The dynamics of heart rate changes immediately following the social exclusion episode yielded information on the most spontaneous preparation for passive, avoidant coping (sustained heart rate deceleration, indicating temporary behavioral inhibition and vigilance, “freezing”) or action-oriented coping (heart rate acceleration, indicating mobilization for action, “fighting”). Aggressive tendencies following social exclusion were assessed using the hot sauce paradigm. On average, social exclusion was followed by heart rate deceleration, indicating the spontaneous drive to avoid directly dealing with the threat ($F(\text{time by condition}) = 3.3, p = .017, \eta^2 = 0.038$). A less pronounced cardiac slowing or even accelerative response to the exclusion, however, was associated with more subsequent aggressive behavior ($r = 0.35, p = .023$). The results indicate that individual differences in exclusion-related antisocial responding are in part already initiated instantaneously following the exclusion experience, before conscious interpretation and regulation efforts can take effect and modulate the behavioral outcome. The findings point to a potentially important factor that, in concert with other determinants, may explain interindividual differences in changes of social behavior following the experience of social exclusion.

1. Introduction

The desire for social acceptance is fundamental to every human being. People are intrinsically driven by the desire to connect with their social world and to avoid disconnection [10]. Feeling excluded or rejected elicits experiences of anxiety and loneliness [11, 83, 88], and deterioration of mood, self-esteem, and control beliefs [32, 47, 82, 83]. Moreover, the hurtful experience of social exclusion [27, 53] evokes changes in the excluded person's social behavior, which may range from increased prosocial and avoidant to antisocial (aggressive) behaviors [66]. Primarily the destructive nature of antisocial behavior makes it seem important to search for individual differences explaining the

variability in the responses to social exclusion.

Empirical research showed that frustrated belonging needs may lead to prosocial behaviors, which are aimed at earning social acceptance and finding new opportunities of affiliation [2, 23, 29, 44, 54, 64, 68, 84]. However, it also indicated that people may seek opportunities to interact with others who were not involved in the exclusion, but do not desire future interactions with those who rejected them [54]. Thus, if uninvolved individuals are not available, options are essentially confined to avoidant and antisocial behavior. Passive avoidance, which may manifest in cognitive and emotional withdrawal and shut-down of social behavior [66, 82] is the least studied behavioral mode of responding to social exclusion. It is associated with the urge to protect

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oneself from further social threat [9].

In addition to evidence that social exclusion may motivate avoidant behavior, other research has supported the exclusion–aggression hypothesis by showing that socially excluded individuals are more inclined to exhibit aggressive behavior toward the excluder [48, 77] as well as to innocent bystanders [76, 80]. Indicators of an increased antisocial or aggressive bias after social exclusion include decreased helping behavior [75], reduced empathy [22], more negative evaluation [76], a more hostile cognitive bias [25], and spiteful treatment of others, for instance, in the form of allocating great amounts of hot sauce to fellow participants who do not like hot food [41, 51]. Outside the laboratory, social exclusion is associated with increased delinquent behavior [57]. Even highly aggressive acts such as school shootings have been linked with experiences of social exclusion and rejection [46, 74]. Of all types of responding, the aggressive variety evokes the greatest societal concerns [65].

To summarize, the aversive experiences of failed inclusion seem to be powerful and acute (see [83]). But research also shows that the behavioral consequences of social exclusion may vary and are inconsistent in nature. Research aimed at explaining parts of this variability has identified several situational variables (e.g., control deprivation, perception of unjustness, prospect of renewed affiliation; [4, 5, 24, 54, 66, 80]) but also individual differences variables (such as rejection sensitivity, social anxiety, narcissism, or a more individualistic versus collectivistic self-construal; [6, 60, 62, 63, 77, 87]) that seem to affect which course of action people adopt after having been excluded, and to which degree.

The observable avoidant or antisocial coping behaviors following social exclusion are posited to be part of a later, “reflective” stage of responding. They are preceded by the first, immediate response to perceiving the social threat, in which conscious and controlled appraisal and regulation efforts have not yet begun to operate (“reflexive” stage; temporal need-threat model; [83]). To date, little is known about the impact of individual differences in this spontaneous, most immediate response to a social exclusion cue on later exclusion-related behavior. The present study addresses this research gap by means of the immediate transient heart rate response to the social exclusion cue. Transient responses refer to instantaneous, dynamic changes occurring on the scale of a few heartbeats.

Several studies demonstrated that the experience of unexpected social threat and rejection is most typically followed by immediate transient heart rate deceleration that exceeds a typical orienting response ([21, 36, 89, 60, 78]). This is in line with the characteristic association of fear elicitors implicating a high degree of self-involvement and imminence of threat with heart rate deceleration (“fear bradycardia”; [90, 91, 38, 92, 93]). In physiological terms, the transient heart rate slowing indicates momentary behavioral inhibition [69]. Additionally, in line with traditional cognitive interpretations of transient heart rate deceleration ([94, 95]), it is thought to implicate prolonged enhanced sensory intake and attention (see also [35, 36]). The interrelation of the two is reflected in the term “attentive immobility”, which is often used to characterize the typical response to imminent threat [55].

In more general terms, individuals react to social threat cues with defensive responses, which may differ interindividually [26, 39]. In the physiological domain these defensive behaviors are commonly categorized into fleeing, fighting, and freezing responses. Psychophysiological research demonstrated that humans engage in active flight when the condition indicates the possibility of escape only [8]. Therefore, the instantaneous biobehavioral response to experimental threat situations in the laboratory, in which fleeing is typically not an option, is either preparation for active fighting (defensive aggression) or passive freezing [15]. Preparation of active coping reactions such as aggressively approaching the perpetrator is associated with heart rate acceleration, which indicates mobilization for action [52]. Freezing is a form of temporary behavioral inhibition, characterized by behavioral

immobility and passive vigilance toward the threatening stimulus, and is typically associated with heart rate deceleration [15, 37, 59, 69]. (Note the close similarity to the concept of attentive immobility). These physiologically based responses to threat roughly correspond to the broader categories of engagement and disengagement coping [18]. Engagement coping refers to coping aimed at actively dealing with the stressor or the resulting distress emotions. Active antisocial (aggressive) behavior following social exclusion belongs to this category. Disengagement coping refers to coping aimed at momentarily escaping from directly dealing with the stressor. Passive avoidance following a social exclusion experience is an instance of this kind of coping. Research demonstrated that experimental manipulations of conditions provoking engagement/disengagement coping in demanding [30, 31] and aversive [13, 50] situations as well as the disposition to use engagement/disengagement coping [42] produced corresponding cardiac effects. Thus, the instantaneous heart rate response opens a window to the first, most spontaneous initiation of coping behavior when faced with exclusion threat. (The actual behavior may then be moderated by controlled appraisal and regulation processes).

The size of the transient heart rate response immediately following social rejection or exclusion depends on the severity of the social rejection experience, with considerable and meaningful interindividual variability ([21, 35, 36, 60, 78, 79]). To date, there have not yet been much research on the behavioral outcomes of individual differences in the cardiac responses to social exclusion, and more generally of individual differences in freezing-like physiological responses in humans, for that matter [37]. However, there is some evidence that more aggressive individuals (as a trait) show reduced heart rate deceleration in response to threat cues and social exclusion, or even heart rate acceleration [33, 73].

Taken together, the present research intended to examine the relevance of individual differences in the most spontaneous initiation of more passive, avoidant (freezing-like) coping immediately following a social exclusion experience, indicated by sustained cardiac deceleration, or more action-oriented coping, indicated by less pronounced cardiac deceleration or even heart rate acceleration, to the victim's later aggressive behavior toward the perpetrator. The experimental design provided no opportunities to affiliate with others who were not involved in the exclusion. Therefore, as explained above, short-term behavioral options were essentially confined to more passive-avoidant or antisocial behavior. We expected individuals showing less cardiac slowing immediately following the social exclusion cue, indicating greater spontaneous (unreflected) readiness to actively deal with the issue at hand, to tend to act more aggressively.

2. Materials and methods

2.1. Participants

The sample comprised 85 female undergraduate university students, aged between 18 and 48 years ($M = 22.6$, $SD = 5.1$), which were randomly assigned to the exclusion condition ($n = 42$) or the inclusion ($n = 43$) control condition. Individuals with major psychiatric disorders/history of major psychiatric disorders according to the Structured Clinical Interview for DSM-IV Axis I Disorders (SCID-I) as well as individuals who reported using psychoactive or cardioactive medication, and individuals reporting any allergy or intolerance against any constituent of the used chili-sauce were not included in the study. All participants were caucasian. The study was advertised in lectures and via e-mail sent out by the university administration. Interested participants entered their phone numbers in a list or in an e-mail to the experimenter and were called to fix an appointment. Participants were recruited from December 2016 to May 2017. In total, 101 students had agreed to participate. Eight of them did not show up. Four had to be excluded because of a self-reported psychiatric disorder or a disorder indicated by the SCID-I. The data of four participants had to be

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