



Testosterone reactivity and identification with a perpetrator or a victim in a story are associated with attraction to violence-related cues



Roland Weierstall ^{*}, James Moran, Gilda Giebel, Thomas Elbert

University of Konstanz, Department of Psychology, Germany

ARTICLE INFO

Available online 22 December 2013

Keywords:

Appetitive aggression
Testosterone
IAPS pictures
Violent story

ABSTRACT

Background: Recent field research has demonstrated that an attraction to aggressive behavior and cruelty is common among combatants and perpetrators involved in organized violence. The biological basis of this appetitive perception of aggression in humans has to date not been studied.

Aims: We examined testosterone as a potential hormonal moderator during induction of specifically appetitive aggressive behavior in the laboratory.

Method: To activate physiological responding related to appetitive aggression, 145 university students (72 women) listened to tape recordings of variants of a violent story. The perspective of the listener in the story was randomized between subjects. Participants were required to either identify as perpetrator, neutral observer, or victim. We assessed changes in saliva testosterone in response to the story. Subsequently, a series of pictorial stimuli (IAPS) with different valence ratings was presented and participants determined the length of viewing time with a button click. This viewing time for negative IAPS was assessed as a dependent variable indicating level of interest in violent scenes.

Results: Men identified themselves with the perpetrator more than women irrespective of the particular perspective presented by the story. Men who responded with an increase in saliva testosterone when adopting the perpetrator perspective chose to view the negative IAPS pictures for longer intervals than participants in other conditions or those who did not exhibit a release in testosterone.

Conclusions: Testosterone moderates attraction to cruel and violent cues in men, as indicated by extended deliberate viewing of violence cues.

© 2013 Elsevier Ltd. All rights reserved.

1. Introduction

Previous attempts to specify a taxonomy of aggression have differentiated an impulsive, reactive form of aggression, associated with self-defense, from a more controlled form of predatory aggression, as typically seen in predatory animals (Siegel, Roeling, Gregg, & Kruk, 1999). Neuro-scientific studies have also investigated aggression in terms of this differentiation in humans (e.g. Blair, 2004; Weiger & Bear, 1988), as has clinical (e.g. Barker, Tremblay, Nagin, Vitaro, & Lacourse, 2006; Dodge, Lochman, Harnish, & Bates, 1997; Vitiello & Stoff, 1997), and sociological research (Stein, 2000). Though these approaches have yielded many insights, these earlier classifications could not account for the possibility that hedonic impulses might motivate human aggressive behavior. This paper attempts to examine aggression in a laboratory setting as a potentially arousing and rewarding phenomenon. We define this as 'appetitive aggression', as opposed to an impulsive, reactive or 'facilitative'

aggression, and attempt to further examine the potential role of testosterone as a biological marker of this behavior.

The primary evidence for this work comes from fieldwork in crisis areas. A great deal of work in this area indicates that appetitive impulses are a major motivation underlying aggressive behavior. In interviewing more than 2500 soldiers in various crisis regions, we found that combatants report that committing violence became easier and enjoyable after only one or two repetitions (Elbert, Weierstall, & Schauer, 2010; Weierstall & Elbert, 2011, see also Maclure & Denov, 2006). Higher appetitive aggression was associated with higher attained rank and increased likelihood of demobilized soldiers rejoining armed groups. Additionally, higher appetitive aggression seemed to have a protective effect against the likelihood of developing posttraumatic stress disorder (PTSD) in a variety of different cultural groups, such as Rwanda (Weierstall, Schaal, Schalinski, Dusingizemungu, & Elbert, 2011), Uganda (Weierstall, Schalinski, Crombach, Hecker, & Elbert, 2012), the DR Congo (Hecker, Hermenau, Maedl, Elbert, & Schauer, 2012) and German WWII veterans (Weierstall, Huth, Knecht, Nandi, & Elbert, 2012).

The concepts appetitive vs. defensive or facilitative aggression are based upon fundamental approach/avoidance motivational concepts of Lang, Bradley, and Cuthbert (1997). Aggressive behavior can either

^{*} Corresponding author at: Department of Psychology, University of Konstanz, P.O. Box 5560, 78457 Konstanz, Germany. Tel.: +49 7531 88 4065; fax: +49 7531 88 4601.

E-mail address: roland.weierstall@uni-konstanz.de (R. Weierstall).

be a self-defensive response to perceived threat by an aggressor (withdrawal), or it may result from an intrinsically rewarding act (approach) (Elbert et al., 2010; Weierstall & Elbert, 2011). The two systems react differently to situations and stimuli encountered in war. Thus, the sound of gunfire, smell of smoke, sight of blood, can evoke the defense cascade of freeze–flight–fight–fright–faint, which with repeated activation forms a 'fear-network', in which the various sensory, behavioral, cognitive and emotional reactions to fearful stimuli become chronically primed, and at their most result in the symptoms of PTSD. Alternately, these stimuli can be perceived as exciting, evoking a fundamental 'hunting network', characterized by arousal and reward-related reactions to stimuli. We hypothesize that these fundamental systems are not limited to crisis regions, where laws and moral taboos are broken down, but manifest themselves in a variety of ways in all societies, for example through the enjoyment of competitive sports or violent media. The functionality of appetitive aggression, such as its protective effect against trauma disorders could be interpreted in evolutionary terms, as more theoretical papers that emphasize that the ability to hunt conveyed survival and reproductive advantages (Daly & Wilson, 1996; Duntley & Buss, 2005) and that it was necessary to appreciate or even enjoy stimuli associated with the arduous and often dangerous task of hunting and killing (Nell, 2006).

Testosterone is a likely candidate as a biological marker of appetitive aggression, as it (a) is a potent developmental, even prenatally active modifier of brain function and the masculinization of the brain (Knickmeyer & Baron-Cohen, 2006) and (b) has been associated with both aggression and also reward mechanisms. Testosterone's association with reward systems in the brain has been demonstrated in animal and human research. Testosterone has been shown to be rewarding in rats in conditioned place paradigms (Alexander, Packard, & Hines, 1994; Arnedo, Salvador, Martínez-Sanchis, & Pellicer, 2002; De Beun, Jansen, Slangen, & Van De Poll, 1992), and in oral self-administration paradigms (Johnson & Wood, 2001; Wood, 2002). In humans, steroid abusers show addiction-like reactions to self-administered testosterone (Brower, 1992; Brower, Blow, Young, & Hill, 1991; Peters & Wood, 2005; Wood, 2008), as well as increased rage, irritability and aggressive behavior (Choi, Parrott, & Cohen, 1990; Parrott, Choi, & Davies, 1994; Su et al., 1993). People with either medically mediated or natural abnormalities in testosterone show corresponding salient changes in aggressive behavior. Tetrahydrocannabinol (THC) has an anti-androgenic effect, and is associated with a reduction of aggression in violent adolescent males (Renfrew, 1997; Tedeschi & Felson, 1995). Transsexuals, either male to female, or female to male, report increases in characteristic opposite sex behaviors with the administration of the corresponding hormones, including aggression (Van Goozen, Cohen-Kettenis, Gooren, Frijda, & Van Der Poll, 1995).

Various experiments in microeconomics find effects of testosterone in competitive games where players can deceive and punish others financially, e.g. the Ultimatum Game or the Point Subtraction Aggression Paradigm (PSAP) (see Carré, McCormick, and Hariri (2011), for review). Higher testosterone is associated with an increased inclination to punish, reject unfair offers (Carré, Putnam, & McCormick, 2009), and the desire play another competitive game vs. a non-competitive game after losing a previous game (Mehta & Josephs, 2006).

Though these results are compelling, it is necessary to design a laboratory experiment that more directly evokes physical appetitive aggression observed in the field. Aggression has been induced in a variety of ways in a laboratory setting. However, many use paradigms that are more likely to induce facilitative aggression, by e.g. using frustration, threat (unpleasant stimuli e.g. electro-shocks, cold water), or insults from the experimenter (Anderson & Bushmann, 1997; Richtelín, Richardson, & Mason, 2010). Other experiments have used media violence to induce aggression, such as computer games (Bluemke, Friedrich, & Zumbach, 2009) and violent films (Bushman, 1995; Linz, Donnerstein, & Adams, 1989). Although these potentially stimulate

appetitive aggression, they do not distinguish subtypes of aggression, complicating outcomes. An experiment from Klimesmith, Kasser, and McAndrew (2006), uses a paradigm more closely related to physical aggression. They found that handling a gun, as opposed to another toy caused an increase in testosterone, which had a partially mediating effect on a subsequent task provoking aggressive behavior.

In this study, we attempted to explicitly test the relationship between an evoked form of appetitive aggression and testosterone release, using a paradigm that is sufficient to induce an emotional state comparable to the one that can be found among combatants in field studies. We have created a violent story, describing a scene in which a soldier viciously beats a farmer, focusing on the detailed experiencing of violence. The use of emotional stories is a well-established paradigm in psychology and has proven its validity to evoke emotional responses (e.g. Cahill, Biabinsky, Markowitsch, & McGaugh, 1995; Cahill, Haier, Fallon, et al., 1996). Experimental conditions are defined by narrating the events from different perspectives: From the point of view of the farmer; from the point of view of the soldier; and from the point of view of a neutral observer. These stimuli reflect complementary elements of appetitive aggression and self-defensive facilitative aggression, by having experimental participants take the point of view of either perpetrator or victim, respectively. The point of view of observer is intended as a control condition. The contrast of appetitive vs. facilitative reactions, intended to activate hunting networks and fear networks respectively, also parallels the above-mentioned approach/withdrawal motivational theory of Lang et al. (1997). Accordingly, the dependent variables are drawn from Lang, Bradley, and Cuthbert's (2008) International Affective Picture System (IAPS); a standardized set of pictures designed to tap these respective motivational systems and rated along the two different dimensions of valence and arousal. We asked participants to rate the IAPS stimuli in terms of valence and emotional arousal (Bradley, Codispoti, Cuthbert, & Lang, 2001). By priming the participants before presentation of these pictures with the violent story and asking participants to take the point of view of either the perpetrator, victim or observer, we predicted that there will be systematic differences in the subsequent viewing times and ratings of the IAPS stimuli, particularly in the perpetrator group, revealing appetitive aggressive responses, i.e. longer viewing times for negatively valenced pictures.

2. Method

2.1. Participants

Participants were 145 university students (72 women). They received financial compensation of 7 Euros for participation in the one-hour experiment. The age ranged from 18 to 39 years (median of 22 in both groups) with no significant difference between sexes (Mann–Whitney *U*-test: $z = .40$, $p = .694$). Ten participants were classified as smokers (i.e. more than 7 cigarettes per week). All participants were instructed to refrain from eating for at least 1 h before participation. Five participants provided saliva samples that were inadequate for salivary assay. Moreover, two male participants were classified as outliers due to their viewing times in the IAPS free viewing time paradigm that exceeded two standard deviations from the group means (one from the neutral perspective group and one from the victim's perspective group) and excluded from the final data set. However, all analyses were also calculated with inclusion of the two outliers, which did not change the results. Thus, complete data were available for 138 participants (69 women). 41 of these women were on contraceptive medication. None of the participants reported being on any other medication or reported suffering from any neuro-endocrinological, neurological or psychiatric disorder or any other general health problems. The University of Konstanz ethical review board approved the study.

Download English Version:

<https://daneshyari.com/en/article/6554695>

Download Persian Version:

<https://daneshyari.com/article/6554695>

[Daneshyari.com](https://daneshyari.com)