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Brief Report

Implicit need for affiliation is associated with increased corrugator activity in a non-positive, but not in a positive social interaction

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ABSTRACT

Affective changes in response to motive-relevant stimuli are a defining feature of implicit motives. We therefore expected to find an effect of individual differences in the implicit need for affiliation (nAff) on corrugator supercilii activity, an indicator of affect, when participants were confronted with nonverbal indicators of a conversational partner's withdrawal. Participants' nAff was assessed with a Picture Story Exercise (PSE). They were then involved in an interaction with a smiling or a neutral experimenter while their corrugator activity was measured with electromyography (EMG). As expected, we found higher corrugator activity for people high in nAff compared to people low in nAff when the experimenter kept a neutral facial expression throughout the interaction but not when he/she was smiling.

1. Introduction

Implicit motives are dispositional capacities to experience positive or negative affect upon contact with specific classes of incentives or disincentives. They operate outside of conscious awareness, respond to nonverbal incentive cues, and influence nondeclarative behavioral outcomes (Atkinson, 1957; McClelland, Koestner, & Weinberger, 1989; Schultheiss, 2008). In line with this general definition, the implicit affiliation motive (need for Affiliation, or nAff) is thought to determine the amount of pleasure that people derive from close, harmonious contact with others as well as the amount of displeasure they experience when rejected – the stronger the motive, the stronger the affect when being in an affiliative situation (Schultheiss, 2008). However, the moderating role of nAff on affect is not well documented for objective measures of affect. The present research therefore addresses this issue by examining the role of changes in affect measured with facial EMG in individuals with varying nAff in response to facial expressions displayed by an interaction partner.

In the context of nAff, nonverbal signals by an interaction partner should have incentive value (Stanton, Hall, & Schultheiss, 2010) because they are a source of information on whether the goal of establishing harmonious relationships has been achieved or not. Smiling faces are generally judged to be more positively valenced than neutral faces (e.g., Johnsen, Thayer, & Hugdahl, 1995; Rösch, Stanton, MacInnes, & Schultheiss, submitted for publication). But that does not imply that neutral faces have neutral valence: Lee, Kang, Park, Kim, and An (2008) reported that perceivers judge neutral faces as negatively valenced. And Rösch et al. (submitted for publication) found that nAff is associated with lower valence ratings for neutral faces only, but does not correlate with valence ratings of smiling faces. In line with these results, Schultheiss, Pang, Torges, Wirth, and Treynor (2005a) reported that people high in nAff, compared to people low in nAff, show impaired learning when being reinforced with a picture of a neutral face but not enhanced learning when being reinforced with a smiling face. The authors argued that a neutral face signals a lack of involvement in the social interaction and is therefore more aversive for people higher on nAff. These observations support the earlier conclusion by Winter (1996) who characterized individuals high in nAff as "'prickly' and defensive" (p. 148) in response to even slight signals of rejection. Thus, individuals high in nAff experience interpersonal situations as problematic or even hostile that individuals low in nAff would deem to be neutral and not offensive. So, nAff is thought to be a rejection-sensitive motive (see also Boyatzis, 1973).

The dependent measure we use, namely facial EMG, is sensitive enough to capture even minute muscle movements (Schandry, 1998; Stern, Ray, & Quigley, 2001) and has been found to be an objective and valid indicator of affective responses to (dis)incentive contact (e.g., Cacioppo, Petty, Losch, & Kim, 1986; see also Berridge, 2000). Specifically, muscle activity of the corrugator supercilii, the muscle between the eyebrows, has been shown to closely track responses to affective stimuli, increasing when negative affect is elicited and decreasing when positive affect is prevalent (Bradley,

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Codispoti, Cuthbert, & Lang, 2001; Larsen, Norris, & Cacioppo, 2003). Fodor and Wick (2009) used corrugator EMG to investigate the affect-moderating role of the dispositional need for power (nPow), that is, the capacity to derive pleasure from having impact over others. They demonstrated that high-nPow people, compared to low-nPow people, respond more negatively and show more corrugator activity when they give a speech in front of an unappreciative audience which frustrates their desire to impress and thereby influence others (see also Fodor, Wick, & Hartsen, 2006). Likewise, Kordik and Schultheiss (in preparation) revealed with EMG that people high compared to people low in need for achievement (nAch), the capacity to derive pleasure from the autonomous mastery of challenging tasks, show a distinct pattern of corrugator activity changes when being confronted with negative performance feedback. While Fodor and colleagues work on nPow focused on incentives related to dominance and submission and our own work on nAch on incentives related to success and failure, in the present research we examine the role of incentives related to friendliness versus rejection on individuals differing in nAff. The studies mentioned above demonstrate that EMG is a valid indicator to describe the affective qualities of implicit motives and that it can be used to investigate a potential common driving force and defining feature of implicit motives, namely affect (see also Cabanac, 1992).

The goal of our present study is to investigate the moderating role of nAff on participants' corrugator EMG responses as an indicator of the presence versus absence of negative affect in response to an experimenter's nonverbal signals of neutral indifference versus friendliness, respectively. Based on the definitions and findings outlined above, we expect that for a high-nAff person, signals of indifference (e.g., a neutral expression) should be more aversive than for a low-nAff person. We therefore expect that interacting with an indifferent experimenter blocks the fulfillment of high-nAff individuals' need for a harmonious relationship, which in turn makes them feel bad. Because previous studies (e.g., Schultheiss et al., 2005a; Schultheiss et al., 2005b) found that gender can play a role in motive-driven reactions to facial expressions, half of the participants were interacting with a male and the other half with a female experimenter.

The study constitutes a specific contribution to existing literatue in two ways: First, it uses a direct measure of affective responses. More specifically, nonverbal expressions of affect in the form of facial expressions are considered a prime indicator of the hedonic impact of goal attainment (Berridge, 2000). Although McAdams, Jackson, and Kirshnit (1984) found that a strong need for intimacy is associated with naturally occurring smiles, our study is the first to use facial EMG in combination with experimentally manipulated incentives to measure affect as an outcome in the context of nAff. Furthermore, although self-reports of emotional well-being are associated with satisfaction and frustration of nAff in field studies (Brunstein, Schultheiss, & Grässmann, 1998), self-reported affective responses to situational manipulation in the laboratory typically do not reflect people's implicit motive levels (Brunstein & Schmitt, 2004; Schultheiss et al., 2005b). In line with these results, Berridge and Robinson (2003) argue that implicit and explicit levels of affect and motivation need to be distinguished and that observable behavioral indicators should be preferred over self-report data (Berridge, 2003). Thus, corrugator activity measured with EMG was the indicator of our choice when dealing with the affective components of nAff, given the validity of corrugator measurements in the assessment of both negative and positive affect (Bradley et al., 2001; Larsen et al., 2003).

Moreover, although the physiological measurements required the study to be conducted as a laboratory experiment, it provides a high degree of external validity since participants thought they were involved in a regular social interaction with the experimenter, ostensibly after the actual study was over.

2. Method

2.1. Sample

Data was collected from 145 students enrolled at Friedrich-Alexander University in Erlangen, Germany. Psychology students and students that had participated in previous studies of the laboratory were not admitted. Eight participants were excluded due to technical difficulties during recording and additional three whose stories on the PSE were below the minimum number of words required (see Smith, Feld, & Franz, 1992). Two participants produced extreme EMG values (with the criterion for the cutoff being studentized residuals > |4.0|) and were therefore excluded as well. The remaining 132 participants (81 women and 51 men), had an average age of 22.68 years (SD = 4.20).

2.2. Design

The study used a nAff × Experimenter Behavior × Experimenter Gender design, with nAff being a quantitative measured predictor variable and experimenter behavior and experimenter gender being two experimentally varied between-subject factors. Participants were randomly assigned to the four resulting experimental conditions. The dependent measure was corrugator EMG activity during the interaction with the experimenter.

2.3. Procedure

After participants had completed the PSE assessment of nAff, electrodes were attached to their forehead to collect corrugator EMG data. Participants then listened via headphones to instructions of a progressive muscle relaxation task (Bernstein, 2002) during which a baseline measure of corrugator activity was taken. Next, participants were working on a picture perception experiment (reported elsewhere) that served as a cover story for the present study. When that task was finished and the experiment was supposedly over, a second experimenter, whose behavior and gender were varied, measured participants' blood pressure with a wrist monitor, allegedly to see if the experiment stressed the participant. During this interaction, corrugator activity was recorded. Prior to this interaction, the experimenter who was performing the manipulation had been sitting behind a computer in the laboratory and made sure he/she did not have any contact with the participant. The interaction with the second experimenter was scripted and both the female and the male experimenter enacting the conditions took part in several training sessions. During these training sessions the procedures were practiced and the experimenters learned to vary only their nonverbal behavior, that is, to make a neutral or a smiling facial expression while keeping wording and pitch of verbal messages constant. The following script was used by the experimenters:

> Alright, [*a marker was manually inserted into the EMG recording by pressing the escape key to mark the beginning of the interaction*] I just need to check the EMG file to see if everything has been recorded properly [*smile vs. neutral expression*]. I will remove the electrodes in just a second – right when I'm finished measuring your blood pressure which will tell me whether the experiment stressed you [*smile vs. neutral expression*]. I need your right arm for this [*smile vs. neutral expression* while the blood pressure monitor was placed on the wrist and the start button was pressed]. Alright...that's going to take a minute [*smile vs. neutral expression*]. That was it...[*smile vs. neutral expression* while removing the blood pressure monitor]. Everything is fine [*smile vs. neutral expression*]. I will now remove