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Emotions in everyday life: an ambulatory monitoring study with female students

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Abstract

Additional heart rate as an indicator of emotional arousal was monitored throughout the day with a special ambulatory device. Fifty female students received acoustic feedback every 10–20 min. The feedback was based either on events (additional heart rate present) or was random without additional heart rate. Following the feedback the subjects were asked to disclose their emotions. The following emotions were listed on the display of the monitoring device: no emotion, happiness, anger, anxiety/fear, sadness, surprise, and disgust.

The frequency and quality of the emotions were not different between event-related and random feedbacks, indicating that the subjects were not able to discriminate between events with and without additional heart rate correctly. Accordingly, the physiological profiles of the differing emotions compared to conditions with "no emotion" were equivocal. The psychological ratings of excitement and enjoyment, however, came up to expectations. The results show that cognitive schemata and personality dimensions are more important in emotion perception than physiological activation.

Keywords: Holter monitoring; Heart rate; Additional heart rate; Physical activity; Emotion; Perception

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1. Introduction

1.1. Controversial issues in emotion research

The study of emotions comprises several controversial issues: methods of emotion induction (laboratory or field studies), response systems (verbal-cognitive, physiological, and behavioral (Lang, 1993)), and the question of basic dimensions (Ekman, 1992) to mention just the most important problems. An interesting question pertains to the interaction of the different response systems. According to the three systems approach, verbal reports, behavioral responses, and physiological activity are coupled imperfectly. Lang (1993) states that "it is possible and even usual to generate emotional cognitions without autonomic arousal, aggressive behavior without a hostile motive, or the autonomic and avoidant behavior of fear without insight (proper labeling)" (p. 22). On the other hand there is the notion that physiological changes even cause the emotion (Schachter and Singer, 1962). This emotion perception model assumes that there is activity in different neurophysiological processes that are detected by some higher-order system to generate an emotion report. However, the perception model was heavily criticized (Reisenzein, 1983).

1.2. Laboratory versus field studies

In laboratory experiments different emotional states are elicited by the experimenter. Dependent variables are activities of the autonomic and somatic nervous system such as autonomic measures (e.g., heart rate, respiration, or electrodermal activity; Johnsen et al., 1995; Stemmler, 1989), the interpretation of facial expressions (Houle and Feldman, 1991; Wilson, 1991), the measurement of emotional coactivation of facial muscles by EMG (Dimberg, 1997; Fridlund and Izard, 1983; Jäncke, 1994), and self-reports of the emotional state. As opposed to field studies, subjects in laboratory experiments know that they will perceive special situations which may enhance the correlations between physiological activation and self-reported emotional states (as shown in an own laboratory study; Myrtek, 1998).

The conclusion of five ambulatory monitoring studies on the perception of emotions in everyday life (Myrtek and Brügner, 1996) was that the perception of additional heart rate indicating emotional arousal was quite different from the results suggested by laboratory experiments. Obviously, in everyday life the identification of emotional arousal is much more difficult than suggested by laboratory studies because we have to account for subjective hypotheses and schemata as proposed by several authors (Pennebaker, 1982; Rimé et al., 1990).

In these studies with nearly 500 subjects, physiological parameters (heart rate, physical activity, additional heart rate) and psychological parameters (excitement, enjoyment) were assessed simultaneously throughout the day. Emotional events were defined by an increase of heart rate without an accompanying increase in physical activity (additional heart rate). Under special requirements a feedback signal was given which requested subjects to answer predefined questions. Between these "event-related" feedbacks (additional heart rate present), "random" feedbacks were interspersed with no indication of arousal. Subjects in these studies were unaware that the feedback signal was triggered by their own heart rate. Despite great mean differences in heart rate (about 7 bpm) with no differences or even a