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Perceiving and remembering emotional facial expressions — A basic facet of emotional intelligence

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ABSTRACT

Decoding the meaning of facial expressions is a major pathway of human communication and has been extensively studied as a basic facet of emotional intelligence. In order to better understand the structure and specificity of the abilities subsumed under emotion decoding from faces (facial emotion perception and facial emotion recognition), the multivariate measurement of individual differences is essential. In the present study, we focused on the abilities to perceive and recognize facial expressions of emotions and investigated their internal structure and nomological net. $N =$ 269 participants with a heterogeneous educational background completed a large test battery including multiple assessment paradigms substantiated in basic experimental research. Results allowed establishing task-general measurement models of facial emotion perception (EP) and recognition (ER). In these measurement models emotion category-related specificity was negligible. The most important conclusion from the present study is the strongly limited specific variance in perceptual performance of certain emotion related facial expressions and emotion decoding from faces in general, relative to face identity processing and fluid cognitive abilities (figural reasoning, working memory and immediate and delayed memory). We discuss implications of the present results for building the nomological net of emotional intelligence and outline desiderata for future research.

1. Introduction

In affective social communication spontaneous and voluntarily produced emotion cues are to a large degree transmitted through facial expressions. Independent of the role of using facial expressions to spontaneously or deliberately express emotion to others, the decoding performance of these communicative cues is a crucial interpersonal ability. Because of their fascinating nature, the recognition of facial expressions has been intensively studied. Facial expressions are universally recognized but they are also to a certain degree culture-specific (e.g., Elfenbein & Ambady, 2002, 2003). Although emotion recognition has been extensively studied, the *structure* and *specificity* of individual differences in facial emotion perception (EP) and recognition (ER) are still incompletely understood because relevant questions have not yet been addressed with a rigorous methodology for modeling individual differences. The present study aimed to investigate the nomological net of EP and ER that has been postulated as basic facet of emotional intelligence (e.g., Mayer, Roberts, & Barsade, 2008). By using structural equation modeling applied to data acquired in multiple tasks of affect perception and recognition, we studied whether 1) individual differences in recognizing discrete emotional expressions are specific for certain expression

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categories, and 2) whether EP and ER are specific relative to face cognition (FC) and cognitive abilities (G).

The multiple task approach is essential for investigating the specificity of a given construct from an individual differences perspective because it allows abstracting from measurement error and generalizing across assessment methods. Experimental psychologists often use single measurement paradigms for addressing such questions and consider cognitive processes to be specific if they differentially respond to experimental manipulations. From an experimental perspective we might infer emotion category-related specificity in affect recognition if different categories of facially expressed emotions are recognized with a different level of accuracy or if they respond differentially to experimental conditions. Experimentally inspired individual differences research focuses on whether or not experimental manipulations affect the correlational structure of the examined variables (Oberauer, Wilhelm, & Schmiedek, 2005). From this perspective, specificity of abilities or dispositions is inferred if they cannot be accounted for by simpler or more basic abilities.

The recognition of facially expressed emotions has been described as a basic ability located at the lowest level of a conceivable hierarchical taxonomic model of performance-based emotional intelligence (e.g., Mayer et al., 2008). Prominent emotion theorists (e.g., Scherer, 2007; 2009) have criticized previous work in this research tradition because of several shortcomings, such as the partial reliance on self-reports and comparisons of subjects' responses with expert scores (see also Wilhelm, 2005). Still, there are persistent discussions on the validity of integrative versus mixed-model measures of emotional intelligence (e.g., Webb et al., 2013), debating and questioning whether self-reports are suitable to measure the construct of emotional intelligence (e.g., Zeidner, Shani-Zinovich, Matthews, & Roberts, 2005). In the present research, we focus on performance-based measures because only these adequately conceptualize ability constructs (e.g., Wilhelm, 2005). This approach circumvents both the controversial issue of incremental validity of self-report measures of emotional intelligence (e.g., Amelang & Steinmayr, 2006; Palmer, Gignac, Manocha, & Stough, 2005; Song et al., 2010) and the absence of established evidence concerning discriminant validity (Brody, 2004; Matthews, Zeidner, & Roberts, 2002).

Scherer (2009) conceptualizes four areas of emotion-related competence: emotion production, response preparation, regulation, and communication. The present research addressed essential parts of the *communication* ability. More precisely, we investigated individual differences in facial emotion decoding — separated into perception and recognition, which is one side of the communication "coin", referring to the *receiver* in face-to-face communication. The other side of the coin, the ability to produce facial expressions, will not be considered in the present report.

An essential step towards establishing a taxonomic model of emotion communication is to address a series of questions about factorial specificity. First, we need to know whether or not individual differences in emotion perception and recognition are specific for different emotion categories, like happiness, surprise, fear, sadness, disgust, or anger. If emotion specificity holds true, separate ability components (factors) for emotion categories are required to adequately describe individual differences. For example, Føllesdal and Hagtvet (2009) analyzed the dimensionality of emotion perception measures of the most frequently used test of emotional intelligence (the Mayer, Salovey, & Caruso Emotional Intelligence Test [MSCEIT], Mayer, Salovey, & Caruso, 2002) from the perspective of generalizability theory; they concluded that generalizing across emotion categories is not acceptable for this measure. Thus, it will be important to investigate the emotion category-related specificity of the measures used here. Please note that our measures are strictly performance-based with veridical correct response standards for all items.

Second, it is of great theoretical and practical relevance to determine the construct specificity of emotion perception and recognition. If it turns out that the emotion factors investigated here are a linear function of one or more established abilities we need to allow for such an explanation in a taxonomic model. Emotion perception and emotion recognition from faces may, for instance, be partly accountable by face cognition (e.g., Wilhelm et al., 2010) and partly by general cognitive abilities. The magnitude of *emotion specificity* can be considered decisive in determining whether emotion reception ability is – from an individual differences perspective – more than cognitive ability applied to emotional contents.

1.1. The emotion category specificity in facial expression perception and recognition

It has been suggested that persons differ in their accuracy to identify emotional expressions belonging to specific emotion categories – thus, someone who is accurate in identifying fear may not necessarily be accurate in identifying anger (e.g., O'Sullivan & Ekman, 2004; Tomkins & McCarter, 1964). Early explanations of such category specificity were related to parental socialization. Tomkins and McCarter (1964, p. 139) argued that "depending on what affects are used to socialize (…), we would have a basis of predicting what common confusions [*in affect recognition*] might arise as a consequence of particular types of socialization." For this reason, O'Sullivan and Ekman (2004) recommended to use stimuli from a variety of different emotion categories when testing perception and recognition abilities. They claimed that performance scores of recognizing facial expressions across emotion categories have some merit, but some ability differences may be missed if specific sub-scores for affect categories are not considered. However, the specificity of such sub-scores has rarely been empirically tested; a recent exception is a study by Schlegel, Grandjean, and Scherer (2012) using a single task paradigm.

Evidence for emotion-category specific brain responses, while perceiving emotion cues, is rather inconsistent. Several literature reviews have called into question that emotion categories (discrete emotions like happiness, surprise, fear, sadness, disgust and anger) and even emotion itself are specific entities or *natural kinds* (e.g. Barrett, 2011; Lindquist, Siegel, Quigley, & Barrett, 2013). Emotions and their discrete categories may be considered natural kinds, if there is a "biological essence that causes it" and the category instances "have some cluster of properties (…) that recur with sufficient *consistency* and *specificity* as to be diagnostic for that category" (Lindquist et al., 2013, p. 255). Discrete emotion categories have been considered as natural kinds because discrete emotion concepts