The Individuation and Recognition of Emotion

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Abstract

First, we argue for the metaphysical claim that emotions are individuated as patterns of characteristic features. Our second claim concerns the epistemology of emotion recognition: We demonstrate that emotion recognition is a process pattern recognition that relies on the same type of pattern recognition typical for object recognition. The analogy allows us to defend a variant of a direct perception account of emotion recognition. We distinguish two forms of *directly perceiving emotions*: 1. perceiving an emotion (almost) without any top-down-processes, 2. perceiving an emotion involving some significant top-down-processes (including expectations and background knowledge), and in addition 3. *an inference-based evaluation of an emotion*.

Keywords: Emotion, Philosophical Theory, Nature of Emotion, Recognition of Emotion

Introduction

What is the nature of emotions and how can we recognize them in other human beings? In this short paper, we cannot do justice to the complex discussions concerning both questions. Nevertheless, we develop our own view with the core claim that emotions are individuated as pattern and that emotion recognition is a process of pattern recognition that has much in common with the recognition of objects by perception. This paper's focus lies on an outline of our account and its advantages, while we only briefly mention the criticism of alternative views.

The metaphysical debate: An overview

In the metaphysical debate we have two extreme positions: emotions are individuated as social constructs (Lutz, 1986; Harré, 1986), on the one hand, or they are individuated as evolutionary anchored affect programs (Ekman, 1972; Griffith, 1997), on the other. Both accounts have severe deficits (Welpinghus & Newen, 2012). Let us mention only the two main deficits: psychoevolutionary accounts state that shared evolutionary history is the only criteria to identify types of emotions. They do not provide any classificatory schemes which do not refer to each category's evolutionary history but for many emotion categories referred to not only in everyday speech but also in psychological theories, it is far from clear whether their members share the same evolutionary history. Thus, the psychoevolutionary account has difficulties providing adequate classificatory schemes, for example for studying emotions in a social context. In principle, psychoevolutionary accounts of emotions can easily account for basic emotions but have problems to account for the role of cognitive contents in so-called cognitive emotions (Zinck & Newen, 2008). On the other hand, the social constructionist can easily account for the latter including the cultural variety of emotion phenomena but they underestimate the strong overlap of the emotion repertoire despite the cultural variation. Here Ekman (1972) has shown that basic emotions like joy, fear, anger, sadness etc. are accompanied with the same facial expression. There is an open debate which phenomena are basic emotions but a strong part of the community presupposes that there are basic emotions which are evolutionary old, shared with animals and develop early in ontogeny (Ekman, 1999; Griffiths, 1997; Zinck & Newen, 2008). The evolutionary anchor of basic emotions constraints our emotion repertoire and undermines the social constructivist view that emotions are entirely created by cultural factors. What could be an alternative? We need to do justice to both features, the evolutionary anchor of basic emotions and the cultural dependence of some emotions. We suggest that the claim that emotions are individuated as pattern is the best alternative: 1. pattern can easily involve both, evolutionary anchored as well as culturally shaped features and thus account for both observations; 2. this view especially helps to distinguish emotion concepts in a society and their natural basis, i.e. some emotions concepts are categorizing only conventional constructs while others are actually anchored in natural kinds (which empirical science has to discover). 2. The account of emotion as pattern is nicely connecting with our folk psychological way of thinking about emotions (noticing the many faces of emotions), 3. the best reductive scientific accounts of emotions have (at least so far) not succeeded in reducing emotions to a very few necessary features which are constituting a type of emotion, 4. furthermore, we observe a great variety of realizations of one type of emotion (e.g. types of fear; types of phobia which are classified according to the intentional object but also according to other features) which indicates that the analysis as a pattern consisting of characteristic features is the best we can gain because it makes it easy to account for the variety of emotion types without loosing the evolutionary anchor. Let us illustrate some of these points while enfolding the view that emotions are individuated as pattern. One important aspect of pattern is that in principle all

features are dispensable: there only has to remain a minimal package of features constituting the phenomenon but none of them is necessarily instantiated. Even this radical feature of pattern is true for several emotions but not for all.[1]

Emotions as patterns

The idea that emotions are organized in patterns and that thus the recognition of emotion is basically a process of pattern recognition is not new (e.g. it is used in Izard, 1972 and Izard et al., 2000). But we aim to develop a detailed own account of it that enables us to analyze emotion recognition in more detail. We will now list and shortly characterize all types of features relevant for the individuation of emotions before focusing on the recognition part:

(1) Autonomic physiological responses: William James (1884) famously claimed that an emotion is the perception of bodily changes, especially changes in autonomic nervous system (ANS) activity. Physiological parameters controlled by ANS activity are crucial for Jamesian emotion theories. However, since not every emotion has a clearly distinct ANS pattern, especially when it comes to more fine-grained distinctions, even clearly Jamesian accounts of emotion such as the account of Prinz (2004) have to provide an account of emotion which grants that two different emotions need not have different patterns of ANS activity. They can be distinguished by other features.[2]

(2) Expressive actions and action tendencies: The psychologist Nico Frijda has coined the term 'action tendency' (which stems from Arnold, 1960) for a felt urge to perform a certain kind of action. This urge is also manifest in bodily changes which are suitable preparations for these actions. He largely equates emotions and felt action tendencies (Frijda, 1986, 71), a move we do not share. Specific actions or action tendencies as the only features are neither constitutive for every type of emotion nor can they alone constitute any emotion: Emotions like happiness are not accompanied by a specific action tendency. An action tendency may become manifest in actual expressive actions or not. Although actions out of emotions are rather flexible, there are typical behaviors for some emotions, such as freezing or fleeing in fearful situations. We routinely rely on expressive actions as well as signs for mere action tendencies for emotion recognition.

(3) Bodily expression: Bodily expression can be divided into (a) facial expression, (b) posture (c) gesture, (d) vocal expression such as screams, roars or laughter and (e) tone of voice. We subsume these under the heading 'bodily expression' because all of these depend on muscle contractions and because these components are usually perceived together. We see a proud person talking: We see her smile, her erect posture; we hear her self-satisfied tone of voice. This leads to an overall impression of her as proud; under normal conditions, we do not pay attention to any of these components separately. Laboratory studies point towards an early integration of these visual and auditory cues (Campanella & Belin, 2007). On the other hand, experiments show that face (Ekman, Friesen & Ellsworth, 1972), but also posture and gesture alone is sufficient to recognize some coarse-grained distinctions (Atkinson et al., 2004).

(4) Phenomenal experience: Emotions are normally accompanied by a particular phenomenal quality or feeling. We do not consider phenomenal experience as necessary because there may be rare cases of emotions in the absence of such feelings, when typical physiological, expressive and cognitive aspects are present (the paradigmatic case is a person with a strong disposition to repress her fear [Sparks et al., 1999; Weinberger, 1990; Weinberger & Davidson, 1994]).

(5) Cognitive features comprise (a) attitudes and (b) shifts of attention and perception. Emotions are often accompanied by cognitive attitudes. Belittling thoughts about the rival are characteristic for jealousy and a judgment that one has been treated unfairly is characteristic (though neither necessary nor sufficient) for anger, to give two examples. Furthermore, sometimes such attitudes are manifest in behavior or are verbally reported. Cognitive components that are less demanding than attitudes are e.g, a shift of attention, for example being alert to dangers in a state of fear. Through such shifts, emotions can make us perceive things we otherwise would not have perceived. They also make us perceive things in a certain light. Some theorists put characteristic ways of perceiving the world at the center of their theory of emotion (Döring, 2003). We will not equate emotion with ways of perceiving a world, but we do acknowledge the role of changes in perceiving the world due to having an emotion connected with a special phenomenology and its role in guiding behavior.

(6) The intentional object: 'Intentional object' is a technical term for the object the emotion is about. 'This can be a particular thing or person (that pudding, this man), an event or an action (the earthquake, your hitting me), or a state of affairs (my being in an aeroplane)' (Goldie, 2000, 16-17). It is not always real. The intentional object (or the type of object) is crucial for the more fine-grained classification of emotions, for example for distinguishing envy from jealousy.[3]

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[1] However, for some emotion concepts, some features are indeed necessary (e.g. test anxiety involves thinking that an exam is going to take place) while others are merely characteristic.

[2] Prinz (2004) argues that some emotions are individuated by a calibration file, i.e. a mental file which includes different judgments that are unified because they all bear on the person's well-being in the same way. Prinz' strategy is to officially claim that the calibration file is part of the cause of the emotion but not constitutive for it. Since he at the same time describes the calibration file as being the essential feature for individuating an emotion, this is finally not a consistent position to hold.

[3] Although the intentional object is crucial for distinguishing emotions from each other, it does not follow that the object is the bearer of the emotion (as an extended mind theorist might want to claim). While we remain neutral about the extended mind hypothesis in general, it is worth noting that our account does not

The features can be thought of as variables, which can take different values (the variable facial expression can take the values 'fearful expression', 'sad expression', etc.) Some values are likely to occur together, others are very unlikely to occur together. This is due to a range of causal mechanisms and constraints, but probably also constitutive and conceptual links. Illuminating these links further is a task for the empirical sciences as well as philosophy. Because some values are likely to occur together, we can learn to distinguish typical patterns of values and form a concept of the overall phenomenon. To illustrate, figure 1 shows a fear pattern.
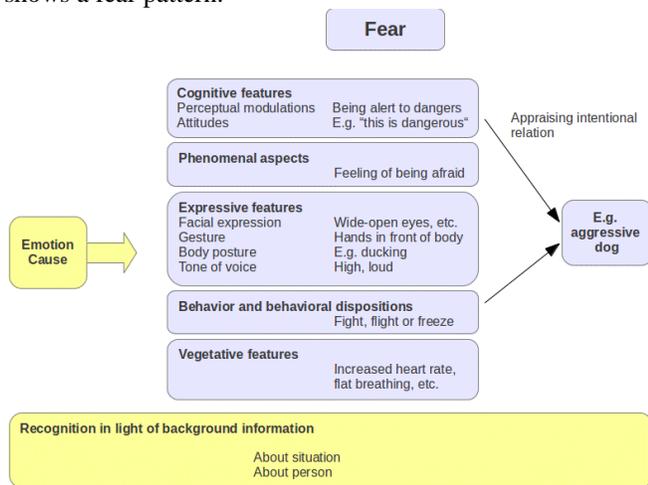

Figure 1: Fear pattern.

Our understanding of 'being constitutive of an emotion'

Are these features constitutive of an emotion? This depends on the underlying conception of 'constitution'. According to an essentialist conception of constitution, a constitutive part of something is also an essential part, a necessary part in all possible worlds. If the part was taken away, the leftovers could not form the same type of phenomenon as before anymore. According to our view of emotions as patterns, emotional features are not constitutive in the essentialist sense, because we do not rule out the possibility to have a token of the same type of an emotion lacking some characteristic features. We think that if there are only a few characteristic features they can be sufficient for an emotional episode to constitute it to be a token of the type anger. Those features of an emotional episode which contribute to it being a token of a specific emotion type are the constitutive parts of an emotion pattern[4]. The fact that a

person is sitting in a car during her angry episode may be part of a token of anger but it is not constitutive of her anger. We suggest a notion of being constitutive for X that accounts for X being a pattern. A feature f is constitutive for a pattern X if it is part of at least one set of features which is minimally sufficient for a token to belong to a type X. 'Minimally sufficient' means that these features are jointly sufficient for the episode to be of type X, but if one of them would be taken away the episode would not count as a instance of X anymore. According to our view, emotions *usually* include overt bodily features (expression or characteristic actions) – if characteristic expressive aspects occur during an emotion episode, they are constitutive and not just an effect of the proper emotion, or a cause for it – but emotions do not always involve expressive components.[5]

One might wonder whether our list of features is exhaustive.[6] Should we include neural correlates, for example? Features like ANS response, behavior, cognitive attitudes, perceptual shifts, and expression all have neural correlates. Neural correlates are insofar not an extra component in addition to the others – we could mention them as part of the individuation features of emotion but we do not have to.[7] They may be used in a clinical or scientific context to infer whether a person is having emotions but are not used in ordinary contexts, since we cannot access them in an everyday context. Also, it is crucial to distinguish the factors relevant for individuating emotions from those which facilitate (or impair) the recognition of emotions. Contextual factors for the recognition of emotions include most prominently (a) the pragmatic context in which it occurs and (b) the personality, goals, beliefs, etc. of the person having the emotion. These features do not belong to the emotion pattern but are only relevant for the recognition

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entail the claim that the object is partly the bearer of the mental state in this case.

[4] We are presupposing a realism about patterns such that in principle for each combination of features it is possible to clarify whether this is an instantiation of the relevant pattern or not. We can of course grant that there are borderline cases and there exists a bundle of transfer cases.

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[5] If someone is trained to inhibit any expressive sign of his emotion, we may still be able to recognize the emotion by inference, e.g. by noticing the force that someone uses to inhibit the expressions in the given context.

[6] We want to clarify the relation of our pattern account of emotion to earlier philosophical component theories of emotions by excluding a main deficit we do not inherit. Some component theories have analyzed emotions as beliefs plus desires plus (often) feelings (e.g. Lyons, 1980; Robinson, 1983). Whatever the relevant components are, Döring (2009) presents the following principle criticism: component accounts cannot explain why an emotion is (usually) experienced as a unitary conscious state. We fully acknowledge that an emotion is experienced as a unitary conscious state, but we will not provide an explanation of why and how this experience came about. Providing such an explanation is not necessary for a plausible philosophical account of emotions. Otherwise the problem would also affect Döring's account – she merely emphasize the unity of emotional experience but do not provide an explanation for it, either.

[7] This is at least true if we presuppose an identity theory of mental and physical states. We tend to do so but at the same time presuppose that the relevant physical state involves more than just a neural state, i.e. the whole body and maybe part of the environment.

of other people's emotions.[8] One may also wonder whether the list of features includes too many features and whether some can be reduced to others: This may be possible – and desirable – in principle but given the state of art in cognitive sciences we have no convincing candidate for a theory which reduces emotions to fewer features and would nonetheless allow us to describe the great variety of emotion phenomena.

Emotion recognition as pattern recognition

Pattern recognition is a general method of classifying world phenomena. We aim to analyze the recognition of emotion as a process of pattern recognition on the basis of perceiving characteristic features and integrating them into a unity by recognizing an emotion and ascribing it to the other.[9] The latter presupposes observers possessing normal conceptual[10] competences. In providing a new version of explicating emotion recognition as pattern recognition we propose a new variant of a perceptual theory of recognizing emotions. We will characterize the process of pattern recognition as one of cue combination and cue integration that culminates in an activation of the most plausible representation of an emotion pattern. This pattern recognition involves a multifactorial weighting process organizing sensory cues from different sense modalities, on the one hand, and accounting for other cues, like social and personal background information, on the other. It is fruitful to distinguish between two types of emotion recognition: The process of pattern recognition by activating the most likely representation of an emotion pattern can take place either without almost any top-down processes or strongly constrained by those. We understand top-down processes as specific processes involving prefrontal activation of the brain; this presupposes as a minimal consensus that prefrontal activation of the brain is necessarily involved in the activation of complex cognitive processes which can be loosely understood as conceptual. We can rely on studies which show that such prefrontal activation is at least sometimes involved in standard perceptual processes.[11] Thus, we distinguish 1. (a basic form of) perceiving an emotion (almost) without any top-down-processes, 2. perceiving an emotion by strongly involving top-down-processes (a strongly concept-modified form of perception).

Both types of perceiving emotions can be distinguished from 3. an inference-based evaluation of an emotion pattern. The latter presupposes a stable evaluation of an emotion as being F, which then may be modified or reevaluated by reflecting on the information (Newen & Welpinghus, under review).

Cue combination and cue integration in recognition of emotions

We have argued that emotions are individuated on the basis of a number of features that constitute an emotion pattern. Our aim now is to characterize the relevant process of pattern recognition in the case of emotions in more detail. To reach that aim, we analyze the process of recognizing emotions in parallel to the process of perceiving objects. We take the relevant model of object perception from Ernst and Bülthoff (2004): It describes how a stable percept is developed by merging the senses in a process of cue combination and cue integration. This model of object recognition can be directly transferred into a model of emotion recognition including four aspects: (i) The bottom-up processes that start with sensory cues of an emotion, which lead to a first estimate of an emotion. A detailed analysis of emotion recognition would have to distinguish at least the following cues: facial expression (F), the gestures (G), the whole body posture (B), the tone of voice (T), autonomic features like sweating (A), the movement/action of the person (M) and the event whose registration triggers the emotion (C). Registering these features also leads to an internal activation of my own, the perceiver's bodily state, e.g. mirror neuron activation, which has been shown at least in the case of seeing disgust in the face of the other person (Calder et al., 2000), and (at least) sometimes also of a visceral activation. (ii) The relevant sensory cues are used for cue combination (combining nonredundant features) and cue integration (selecting one dominant out of a group of redundant features); it is plausible that the process of registering an emotion starts with cue combination of complementary features like F and M producing an intermediate (normally unconscious) estimate E1 of an emotion state, as well as a combination of G, B, A and M, which may constitute a different (normally unconscious) estimate E2 of an emotion state. In a second step, we are in need of integration of redundant cues like E1, E2 and E3 while the latter may be triggered by the auditory cue (T) together with registering the cause (C). (iii) Cue combination and integration leads to an activation of the most likely emotion pattern (on the basis of Bayesian principles) which is connected with a (normally conscious) stable percept. Thus, there is a plausible sense in which we can say that we see an emotion while seeing a person having the features mentioned above. The percept we have is directly associated with the activation of an emotion pattern which we are able to distinguish from others. (iv) Furthermore, the development of an emotion percept may be influenced by top-down processes. Thus, the percept of an emotion is a product of sensory cue combination and

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[8] Fear is fear no matter whether the observer knows that he deals with an anxious person or a courageous person but it is much easier to recognize knowing this and we can recognize it easier in an obviously dangerous setting than in a (seemingly) save setting.

[9] We allow for the case of emotion recognition without ascribing it to the other, i.e. without conceptualization but this case will not be the focus of this paper.

[10] For the sake of argument we can identify conceptual and linguistic abilities. For a fine-grained distinction between linguistic and non-linguistic concepts in the context of animal cognition, see Newen and Bartels, 2007.

[11] We are not discussing here what it means to possess concepts since it is sufficient to account for top-down influences to establish a general picture of perceiving emotions.

integration influenced by top-down processes: In the case of emotions, situational and person-specific background knowledge can modify the basic bottom-up processes that predicted the emotional state of the other.

Concluding remarks

Describing emotions as patterns of characteristic features has a number of advantages: First, in the debate between evolutionary theorists and social constructionists, it offers an account that allows to integrate evolutionary anchored as well as culturally shaped features. This especially helps to distinguish emotion concepts in a society and their natural basis, i.e. some emotions concepts are categorizing only conventional constructs while others are actually anchored in natural kinds. The pattern theory accounts for a significant degree of conceptual flexibility in the realm of emotions – based on formal objects and on similarity relations among the various emotion features; given the nature of our affect programs we can actually form a number of coherent classificatory schemata for emotions. Social constructionists often concentrate on emotion categorization in different culture which may be different even if the behavioral dispositions of the people from different cultures would be very similar. We can account for this by characterizing emotions concepts by the significant pattern including behavioral as well as cognitive features. Evolutionary theorists claim that despite cultural variation that any real emotion is constituted by an underlying common core of a few evolutionary anchored features, e.g. fear involves the disposition to freeze or to initiate flight behavior, it has its typical phenomenology. These observations are accounted for by distinguishing rather inflexible and more flexible features of an emotion type. On the basis of the metaphysical view that emotions are individuated as pattern, we argued for a theory of emotion recognition such that it is a process of pattern recognition which is furthermore parallel to object recognition: the same processes of cue combination and cue integration are relevant to develop a percept of an emotion when observing the affective state of another human being. We indicated that we can characterize the perceptual access to emotions as direct, i.e. unmediated by any inferences but we could not develop this view in detail here: we only outlined that the direct perception thesis needs qualification by working out the role of top-down processes in emotion recognition (see Newen/Welpinghus under review). But despite the difference in the relevant features of recognition, both recognition of emotions as well as of objects are analyzed as relying on the same functional processes constituting perception of entities (of any kind). Thus, our model has the advantage of being very parsimonious.

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