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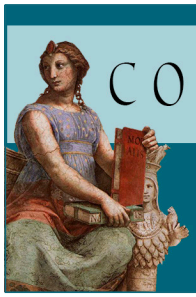

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Perceiving emotions in (and through) social interactions: a deweyan account

Perceber emoções em (e através de) interações sociais: uma proposta deweyana

Felipe Nogueira de Carvalho*
felipencarvalho@gmail.com

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Abstract: In our everyday interactions we easily and effortlessly perceive emotions in others' facial expressions and bodily behavior. How do we do that? Philosophers and psychologists have long argued about the fundamentals of emotion perception and the debate is far from settled. While some insist on the sufficiency of the morphological information contained in facial expressions, others construe the objects of emotion perception as more complex, comprising multimodal information such as touch, tone of voice, body postures, and so on. Others, in turn, have gone so far as to deny that there is a pre-given object in emotion perception in the first place, so that processes of emotion perception must be conceptualized as emergent and co-constructed phenomena in contexts of social interaction. The purpose of this paper is to argue that John Dewey's pragmatist theory of emotions can help us make significant theoretical advancements in the understanding of emotion perception, according to which emotions are coordinated modes of behavior that we enact with others in the contexts of social interactions. In this picture, perceiving emotions is a matter of participating in a joint activity of socio-affective coordination. This theory allows us to apprehend important insights about emotion perception that appear in these contemporary debates, while at the same time avoiding their pitfalls.

Keywords: Emotions. Emotion perception. Multimodal perception. Modes of behavior. Social cognition.

Resumo: *Em nossas interações cotidianas, percebemos facilmente e sem esforço as emoções nas expressões faciais e no comportamento corporal dos outros. Como fazemos isso? Filósofos e psicólogos há muito discutem sobre os fundamentos da percepção emocional e o debate está longe de ser resolvido. Enquanto alguns insistem na suficiência das informações morfológicas contidas nas expressões faciais, outros interpretam os objetos da percepção de emoções como mais complexos, compreendendo informações multimodais como toque, tom de voz, posturas corporais etc. Outros, por sua vez, chegaram ao ponto de negar que existe um objeto pré-dado na percepção emocional, de modo que os processos de percepção emocional devem ser conceituados como fenômenos emergentes e co-construídos em contextos de interações sociais. O objetivo deste artigo é argumentar que a teoria pragmatista das emoções de John Dewey pode nos ajudar a fazer avanços teóricos significativos na compreensão da percepção de emoções, segundo a qual as emoções são modos coordenados de comportamento que encenamos com os outros nos contextos de interações sociais. Nesse quadro, perceber emoções é uma questão de participar de uma atividade conjunta de coordenação socioafetiva. Essa teoria nos permite apreender importantes insights sobre a percepção das emoções que aparecem nesses debates contemporâneos, ao mesmo tempo em que evitamos suas armadilhas.*

Palavras-chave: *Cognição social. Emoções. Modos de comportamento. Percepção de emoções. Percepção multimodal.*

* Pesquisador de pós-doutorado CAPES-PrInt no Programa de Pós-graduação em Filosofia da Universidade Federal de Minas Gerais.

1 Introduction

When we see someone widening their eyes and mouth, we can immediately see that this person is afraid. When we receive in our smartphones an emoji with a frown, lifted eyebrows and tears rolling down its cheeks, we can tell right away it is an expression of sadness. How is it that we perceive emotions in facial behaviors so easily and effortlessly?

In the heydays of emotion perception research in the 60's and 70's, most empirical data were collected by showing people photographs of prototypical expressions of basic emotions such as anger, sadness, fear, happiness, surprise, and disgust. This methodology was applied in more than a dozen cultures all over the world, and results supported the idea that emotion perception is universal (EKMAN, 1989). That is to say, no matter where you are in the world, everyone will make the same facial expressions of basic emotions, and you will be able to immediately recognize these emotions with remarkable accuracy.

A puzzle, however, still remains. This research focuses on photographs of prototypical facial expressions, but we rarely perceive facial expressions in isolation. On the contrary, facial expressions are typically perceived in a rich context that includes body postures and movements, tone of voice, social setting, visual scene, and so on. Moreover, there are many instances of emotion expression that diverge from the prototype. We do not always widen our mouth when we're afraid or frown when we are sad, and with enough contextual information we can perceive anger and sadness in non-prototypical expressions just as easily. Facial expressions, therefore, cannot be the whole story of how emotions are perceived, at least not in isolation.

As expected, there is an ongoing debate on emotion perception that is far from being settled. While some insist on the sufficiency of the morphological information contained in facial expressions, others construe the objects of emotion perception as more complex, comprising multimodal information such as touch, tone of voice, body postures, and so on. Others, in turn, have gone so far as to deny that there is a pre-given object in emotion perception in the first place, so that processes of emotion perception must be conceptualized as emergent and co-constructed phenomena in contexts of social interaction.

The purpose of this paper is to argue that John Dewey's theory of emotions (1894-1895) can help us make significant theoretical advancements in the understanding of emotion perception. In Dewey's theory, emotions are coordinated modes of behavior, practical skills that we enact with others in the contexts of social interactions. This theory allows us to apprehend important insights that appear in these contemporary debates while at the same time avoiding their pitfalls. In a Deweyan account, perceiving emotions is a matter of participating in a joint activity of socio-affective coordination, not passively observing a pre-given object.

The structure of the paper is the following. In the next section I will briefly go over the beginnings of empirical research on emotion perception, as basic emotion theorists posited that emotion categories can be automatically perceived in facial expressions alone. I will then discuss some evidence that calls this theory into question, arguing that the object of emotion perception is a more complex entity that acquires its meaning in conjunction with other contextual factors. These theories will draw an analogy between emotion perception and the perception of ordinary objects (like tables, cups, and chairs), and borrow theoretical tools and empirical findings from object perception models in cognitive science.

I will then discuss Gendron and Barrett's (2018) objections to these models, which calls into question the analogy between emotion perception and the perception of ordinary objects. In their proposal emotions are not pre-given objects but something that emerges between people in the context of a social interaction. However, one downside of this theory is that emotion perception processes will end up being conceptual acts, as two agents attempt to synchronize their emotion concepts as their interaction unfolds in time. A more desirable theory, which allows us to keep their valuable insights without their high intellectual costs, can be found in John Dewey's theory of emotions as coordinated modes of behavior, which will be clarified in the final section of the paper.

2 Basic emotion theory and its challenges

Figure 1: From Ekman and Friesen (1975)

Take a quick look at the image above. Chances are you will be quite good at perceiving the emotion expressed in these facial movements. Not only that, but your perceptions will most likely be aligned with the rest of humankind, no matter how different their culture is from yours (EKMAN, 1989).

This makes evolutionary sense. Facial expressions, after all, serve the important function of signaling co-specifics that specific types of environmental challenges are present. If I widen my eyes and mouth in a prototypical expression of fear as I look into the bushes, it will be useful for you to have hard-wired mechanisms that will automatically detect fear in these facial movements, letting you know that something dangerous is before me. This led some basic emotion theorists to suppose that, just like the production of prototypical expressions of basic emotions is universal, so is their recognition, something that has become known as "the readout hypothesis" (BUCK, 1994). This hypothesis states that expressions of basic emotions can be read directly and automatically in the face on the basis of morphological features alone.

But there's a puzzle. If it makes evolutionary sense to have hard-wired mechanisms that automatically detect emotions in facial expressions, it also makes evolutionary sense to suppose that such a mechanism shouldn't be sensitive to morphological features of the face alone. Our ancestors, after all, rarely encountered facial expressions in isolation, but mostly accompanied by body postures and gestures, tone of voice, visual context, and so on, and the same, of course, holds for us today. And while it is plausible to suppose that these contextual factors might influence processes of emotion perception, the research described here focused only on photographs of facial expressions.

This led some researchers to suspect that this evidence was an artifact of flawed experimental designs, and that processes of emotion perception were much more flexible and context-dependent than previously supposed. The problem, as James Russell (1994) pointed out, is that participants in these studies were given a forced-choice task, in which a closed list of basic emotion terms were presented alongside the facial expression, and participants had to choose, from this list, the word that best matched the expression. But when Russell allowed his participants to choose freely what emotion they perceived in photographs of basic emotion expressions, the rate of agreement dropped considerably. In a free

choice task with a prototypical expression of anger, for example, more people chose "frustration" over "anger", and a significant portion chose other idiosyncratic labels that did not fit easily into discrete emotion categories (RUSSELL, 1994).

The problem is that without enough context participants' perceptions are ambiguous. If this is so, then perhaps contextual parameters might influence which emotion category is perceived in a given facial expression, a hypothesis that has been confirmed by a large number of studies.[1] Aviezer and Hassin (2008), for example, found that when prototypical expressions of basic emotions were inserted into body postures that suggested other emotions, participants claimed to perceive the emotions suggested by the context, rather than the original category of the facial expression. For example, when a prototypical expression of disgust was inserted into a body posture that suggests anger, participants consistently claimed to see anger in that facial expression. This evidence strongly suggests that processes of emotion perception take into account various contextual parameters that influence which emotion is perceived in a given facial expression.

Although these studies dealt a hard blow to the readout hypothesis, more recent versions of basic emotion theory were able to accommodate these findings in more flexible models of emotions and emotion perception. In a model such as Keltner's, for example, "there is not necessarily a one-to-one correspondence between the occurrence of an emotion and a prototypical expression […]. Rather, emotions are expressed in prototypical *multimodal patterns of behavior*" (KELTNER *et al*., 2019, p. 139, our emphasis). In other words, what is considered to be an expression of emotion in these theories is no longer facial movements alone, but facial movements along with body postures, tone of voice, patterns of touch, and so on.

If this is so, then perceiving emotions is no longer a matter of extracting morphological information from the face but of integrating multimodal information into a coherent whole. This led researchers to a reconceptualization of emotion perception, where the fundamental theoretical task was to explain how a perceptual system is able to extract various bits of multimodal information from a given visual scene and integrate them into a unified whole, which corresponds to the emotion category perceived.

3 Object perception models of emotion perception

This approach has an advantage. If we think of emotion perception as analogous to perceptual processes of multimodal binding, we can draw an analogy between emotion perception and the perception of ordinary objects and borrow theoretical tools and empirical data from research in multimodal object perception for our theory of emotion perception. We may call this *object perception models* of emotion perception. The basic strategy behind these models is, first of all, to conceive of emotion expressions as complex patterns of stereotypical features, involving facial movements, body postures, tone of voice, behavioral tendencies, and so on (the features which constitute and individuate each emotion pattern will vary slightly from case to case). Then, the model will search for a suitable account of the multimodal binding of ordinary objects and apply it to emotion perception.

Take, for example, the proposal developed by Newen, Welpinghus and Juckel (2015). In this proposal, to perceive emotions is to perceptually recognize a certain kind of multimodal pattern, through processes that they call *cue combination* and *cue integration*, whose output is a representation of an emotion pattern that we recognize as fear, anger, sadness, etc. These processes are well supported by cognitive science, in particular, by Ernst and Bülthoff's research on multimodal perception of ordinary objects (2004). Without going into too much detail which would digress from our main point, cue combination can be understood as "a process of binding together non-redundant features of the same entity from

1 See Barrett, Mesquita and Gendron (2011) for a comprehensive review.

different senses", while cue integration "is a process of systematic weighting of redundant information to exclude some irrelevant features" (NEWEN *et al*., 2015, p. 197), whose output is a representation of a certain type of object. This theory of multimodal object perception, as the authors put it, "can be directly transferred into a model of emotion recognition" (NEWEN *et al*., 2015, p. 198).

Even though, for reasons of space, we are not able to explore more of these models in detail, other examples of this strategy can be found in Aviezer and Hassin's "emotion seeds" theory (2008), which borrows from Moshe Bar's studies of object perception (2004), as well as Adams and Kveraga "social vision" theory (2015), which builds on research by Kveraga, Ghuman and Bar (2007) on the perception of ordinary objects. Both of these theories are examples of what I have been calling "object perception models" of emotion perception.

Other researchers, however, have called into question the basic premise behind object perception models. In these kinds of models, "the perceiver's job is to merely detect what is right there, in front of her. A scrunched nose and furrowed brow is disgust, just as surely as a small open container with a handle is a cup" (GENDRON; BARRETT, 2018, p. 102). However, the authors argue that emotions are not pre-given objects encountered by a passive observer, so that it is misleading to draw an analogy between object perception and emotion perception. We'll look at an alternative to object perception models in the next section.

4 Emotion perception as conceptual synchrony

There are two main problems with object perception models. Firstly, outside of the lab, emotion expressions are dynamic, constituted by subtle facial and bodily movements that are constantly changing and evolving as two agents interact and coordinate affective meanings with one another. If this is so, we cannot base our understanding of emotion perception in studies of object perception that use static stimuli that lack ecological validity. Secondly, emotion expressions are highly variable, meaning that more often than not, we do not clench our teeth when we're angry, or widen our eyes when we are afraid; the fear of being robbed in a dark street, of giving a talk at a major conference, or of the global rise of fascist leaders have very different expressive profiles, and yet, given enough context, we can just as easily recognize these different instances as instances of fear.

If this is so, there may not be enough statistical regularities in expressive features associated with each emotion category. Rather, when we talk of emotion perception, we are talking about a task in which "the perceiver must extrapolate from subtle, variable, and dynamic movements […], embedded within a situation, to arrive at an understanding of another's continually evolving internal state" (GENDRON; BARRETT, 2018, p. 102). This cannot be captured in object perception models, which are based on static stimuli of prototypical features that lack ecological validity.

In Gendron and Barrett's proposal, emotions are not pre-given objects that are internally generated and whose output (a complex face/body expression) will be perceived by a passive observer. Rather, emotions emerge dynamically between two agents as their social interaction unfolds in time, through a process of psychological co-construction that is constantly being updated and corrected by sensory input from the other person's verbal and expressive behavior.

Let us make this process of psychological construction clearer. The general theoretical framework behind this proposal is Barrett's *conceptual act theory* (2014), according to which emotions are not natural kinds but psychological constructions. By this she means that emotions are constructed by human brains on the basis of two ingredients: affective feelings (also called "core affect") and emotion concepts. In brief, core affect represents the current state of the body, and arises on the basis of homeostatic processes that monitor levels of oxygen, glucose, H_2O, various hormones, and so on. Whenever we prepare ourselves for an upcoming action, such as running quickly after hearing footsteps in a dark alley

or walking into a packed conference hall in order to give a speech, there will be fluctuations in some of these levels, which will be felt in the form of affect along two dimensions: valence and arousal, i.e., as pleasant or unpleasant feelings with a certain degree of agitation (from relaxation to excitement).

These core affective states, however, are not yet emotions. An emotion experience will arise only when a core affective state is categorized with an emotion concept. Therefore, although core affect forms the bodily basis of emotion, full-fledged emotions are *conceptual acts*, and will only arise when the agent develops emotion concepts and applies them to the core affective experience. Without emotion concepts there will be core affective experience but not emotions. This means that what makes an experience *emotional* is not (or not only) its associated core affective feelings but whether this experience is conceptualized as an emotion. The same core affective state – for example, an unpleasant sensation of stomach cramps with a certain degree of agitation – might be conceptualized as "hunger" in a context where it's almost lunchtime, or as "nervousness" in a context where one is about to give an important speech. Although the core affective feelings are the same, only in the second case the experience has emotional significance, due to how it is conceptualized.

This, in short, is Barrett's conceptual act theory of emotions. The main innovation of Gendron and Barrett's paper is to apply this theory to emotion perception and conceive it in terms of processes of psychological co-construction. The main difference, of course, is that in the case of emotion perception, what the agent is categorizing with an emotion concept is not her own core affective state but sensory and verbal input coming from the other's behaviors – utterances, facial expressions, bodily movements, and so on. This theory departs from object perception models insofar as emotion perception is here conceived as a dynamic process of *co-construction*, whereby one's construction process is constantly being adjusted by the other as the interaction unfolds in time. How Anna constructs Tom's emotions with her emotion concepts at time t_1 will affect not only how Tom constructs his own emotions at t_1 but also how he constructs Anna's in turn. Thus, Tom's construction process at t_1 will make Anna refine and correct her construction process at t_2, which will subsequently affect Tom's own constructions at t_3, and so on and so forth.

An important consequence of a proposal like Gendron and Barrett's is that emotion perception is no longer evaluated in terms of *accuracy*, i.e., how well it represents a certain pre-given object. Rather, the key success condition governing emotion perception now becomes *synchrony*, so that a perception of the other's emotions will be successful when the two interactants are able to synchronize their construction processes on the basis of their shared emotion concepts.

I believe Gendron and Barrett make plausible points and sensible methodological prescriptions that should be taken into account. In particular, I accept their suggestion of abandoning the lone observer's perceptual system and focus instead on the dyad of interaction as the basic unit of analysis of emotion perception. I also believe that substituting "accuracy" for "synchrony" is on the right track, a move that is actually needed when we start thinking of emotion perception in terms of embodied social interactions that dynamically unfold in time. In other words, just like philosophers emphasized that perception is *for* action – that is, that perception cannot be understood in isolation from an organism's actions in its environment (HURLEY, 1998; NOË, 2004) – we must be clear that emotion perception is *for* interaction, such that one cannot be understood without the other. In this sense, Gendron and Barrett are surely right in emphasizing that the dyad of interaction should be the basic unit of analysis of emotion perception.

What I do not agree, however, is that this activity of coordination should be understood in terms of conceptual synchrony, whereby two agents attempt to synchronize their emotion concepts. Of course, I do not doubt that conceptual synchrony exists, and is an important part of our joint affective activities. When we are discussing our feelings with our therapist, or arguing with a romantic partner, we are often trying to find the right emotion term to make sense of our situation. In these kinds of cases, how I perceive my partner's emotions will surely be influenced by the emotion concepts we bring to the interaction. *Are you angry? Is this frustration? I guess you must be disappointed?*

What I dispute, however, is that these cases should be our paradigm examples of emotion perception. As I see it, conceptual synchrony is just a special case of a more general phenomenon of the joint coordination of affective meanings. If this is so, we need a more general characterization of emotion perception as a joint activity of coordination of affective meanings, which does not presuppose the possession and deployment of emotion concepts.

This is where John Dewey's theory of emotions come in. As I will argue in the final section of the paper, this theory has the resources to capture what is right about Gendron and Barrett's insights and methodological prescriptions without the disadvantages of over-intellectualizing our activities of coordinating affective meanings.

5 Emotion perception and social interaction: a deweyan account

In two articles published in 1894 and 1895, John Dewey develops a hybrid theory of emotions according to which emotions are complex phenomena comprising both internal and external elements: they involve feelings and thus are partly constituted by internal states with phenomenal qualities, but they also extend onto the world comprising both expressive behaviors and worldly objects.

Dialectically, Dewey develops his position by critically examining two theories of emotion that were very influential at the time: Charles Darwin's ([1872] 2005) and William James's (1884). From Darwin, Dewey retains the idea that emotion is to be studied by looking at the organism's phylogenetic past, to actions that proved to be adaptive in its ancestors' dealings with various environmental challenges; and from James, Dewey retains the idea that emotion is tightly connected to action and expressive behavior. However, Dewey criticizes Darwin for taking action to be primarily in service of *expressing* emotions, rather than as adaptive movements in themselves, and for taking emotions to be causally prior to action rather than being constitutively connected with it (DEWEY, 1894). Finally, he criticizes James for focusing excessively on emotional feelings rather than emotions themselves, and for proposing that emotion *follows* action rather than being constitutively intertwined with it (DEWEY, 1895).

On the basis of these criticisms is Dewey's contention that it is a mistake to separate the object of emotion, the feelings of emotion, and the actions and expressive behaviors of the agent.[2] Although this separation is something we can do from a third-person, theoretical point of view, from the point of view of the emoter, the object, the action and the emotional feelings are tightly intertwined and form a unified whole. As Dewey puts it, "we have but one organic pulse, the frightful bear, the frightened man, whose reality is the whole concrete coordination of eye-leg-heart-activity" (DEWEY, 1895, p. 21).

In Dewey's theory, therefore, agency occupies a central role, as can be seen in his proposal that emotions are *modes of behavior*, which should not be understood in behavioral terms as mere bodily movements or reactions but as complex states comprising both internal (neural and physiological activation, phenomenal qualities, thoughts, etc.) and external (actions, expressive behavior, worldly items, and transactions with the external environment) elements. It is the mode of behavior that unifies object, feelings, and action into a unified whole, and stands for the "concrete whole" of emotion experience, as Dewey likes to put it (1895, p. 16). This means that emotions are ways of dealing with things in the external environment, and the feelings that typically accompany emotions are, precisely, feelings that prepare us for, and that arise in conjunction with, actions in the world. "The sudden readiness to injure another", Dewey tells us, "is precisely what we mean by anger" (1895, p. 17).

In this picture, an emotion like anger is not an internal state that is then expressed in the form of clenched teeth, growls, and yells. Rather, emotions are enactments, things we live through as we shout, push, shove, count to ten, hit our fists on the table, fall on our knees, and so on. When we talk of a

2 On the importance of this contention see Krueger (2014).

feeling of anger, one's shouting, or an insulting remark, we are really talking of one and the same thing, which is a way of dealing with offenses and injustices that has been selected for and shaped by cultural forces. More importantly to the purposes of this paper, other people play a crucial role in how we enact our emotions, both synchronically, by scaffolding our current emotion experience, and diachronically, as we socially learn various bodily skills that allows us to enact emotions in appropriate ways in various contexts according to social norms.[3]

Take, for example, the case of "laughter" discussed by Dewey (1894). Rather than taking its main function to be the expression of an internal state of joy, as proposed by Darwin, Dewey insisted that laugher, as part of a mode of behavior, should be understood in the context of an agent's transactions with other agents in the external environment, where it functions as a social signal that shows affiliation or that attempts to influence others' behaviors in various ways. As Dewey puts it, "a child of from one and a half to two years uses the laugh as a sign of assent; it is his empathic 'I do' or 'yes' to any suggested idea to which he agrees or which suddenly meet his expectations" (1894, p. 558). This analysis in accord with empirical evidence that shows that people smile much more often when in the presence of others or when others are looking at them, which is just what we would expect if smile was a social signal rather than an expression of an internal state.[4]

6 Closing Remarks

So now that we have a rough idea of what Dewey's theory of emotion looks like, how can it help us come up with an account of emotion perception that does justice to Gendron and Barrett's insights while avoiding their pitfalls? Let's return to our previous example of "laughter" and imagine a child playing with her caretaker. The child smiles, laughs, open her arms and approaches the caretaker in order to hug him, picks up a toy and walks towards him smiling and showing him the toy, and so on. The caretaker, of course, smiles back, laughs, picks the child up, plays with the indicated toy, and so on. What is it, for the caretaker, to perceive happiness in the child's expression and behavior?

In Dewey's theory, "happiness" is a mode of behavior that the child enacts with her caretaker as both coordinate their expressive movements on the basis of bodily signals such as smiling, eye contact, arms open, approach behavior, invitation to play, and so on, which can be flexibly adapted according to (socially learned) practical knowledge about what is appropriate in various situations. If this is so, the caretaker is not a passive observer of the child's happiness but an active participant in the child's enacted mode of behavior, and perceives her emotion *by* socially interacting with her, as both coordinate their bodily and social skills as the interaction unfolds in time.

In cases like this, Gendron and Barrett are undoubtedly right in pointing out that the child's happiness perceived by the caretaker is not a pre-given object but something that emerges in the dynamics of the interaction in response to the caretaker's behavior. In a different context the caretaker might perceive happiness in the child's movements even without stereotypical behaviors such as smiling and laughing, depending on the context and the nature of their relationship (a parent of a timid child might perceive happiness on the basis of very subtle bodily signals that would slip by unnoticed to other people). To perceive happiness is indeed a matter of coordination, not accuracy; it is an embodied, practical skill that does not depend on the presence of stereotypical features.

But what reason do we have for supposing that what the child and the caretaker are doing amounts to synchronizing their concepts? Isn't it more parsimonious to suppose they are coordinating their behaviors and bodily skills? To be sure, some shared affective meanings will emerge in this

3 For a good analysis of how bodily profiles of emotion are in many cases socially learned bodily skills see Hufendiek (2016).

4 This evidence is reviewed in Krueger (2014).

interaction, but these meanings need not be conceptual; they are, rather, embodied ways of negotiating the social world, or, to use Dewey's terminology, *modes of behavior.* To perceive happiness, in this picture, is just to be able to participate in coordinated activities of "happiness" modes of behavior, i.e., ways of dealing with persons that transmit, sustain and amplify positive affect. "Happiness" will be perceived in this interaction when embodied coordination is successful.

We are only led to suppose this is a case of conceptual synchrony if we subscribe to the conceptual act theory of emotion, but in this paper, I have argued that Dewey offers us a much more compelling theory. Rather than taking conceptual synchrony to be the paradigm case of emotion perception, in Dewey's account conceptual synchrony is just a special case – one involving emotion concepts – of a more general phenomenon of coordination of modes of behavior. As such, it can explain all cases of conceptual synchrony and many others that are not captured by this model's theoretical tools, such as the example above of the child/caretaker interaction. Therefore, Dewey's theory allows us to capture some of the valuable insights and methodological prescriptions offered by Gendron and Barrett without any of their pitfalls.

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