Navigating the Waters of Emotion with a View Toward Cooperation

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Abstract

What emotions are is a central question in the science of emotion, and is often interpreted as a question about how one should define the theoretical term "emotion." It is also often interpreted as an invitation to understand the nature of emotions. In this paper, I demonstrate how these two interpretations can be related through an interdisciplinary, pluralist approach to the science of emotion. In doing so, I illustrate the limits of Klaus Scherer's proposed consensual, polythetic working definition with respect to some fundamental concerns in the science of emotion. I use the meta-semantic taxonomy of theories of emotion to argue that once psychological theories of emotion are more clearly delineated according to two fundamental concerns— the metaphysical and the meta-semantic—one can not only trace the logical implications of these fundamental concerns to their implications for the design of empirical research, but one can also more clearly understand that the pursuit of knowledge in the science of emotion requires both those who take emotions to be stars, as well as those who take them to be constellations.

1. Introduction

Approximately twenty years ago, Klaus Scherer (2000) and James Russell (2003) argued for the convergence of emotion theories on a consensual definition of emotion. Approximately ten years later, a special section on defining emotions was published in *Emotion Review* (2010, volume 2, no. 4), followed by a second special section, edited by Russell (2012, volume 4, no. 4). More recently, Scherer observed that such efforts were unsuccessful, yet he also expressed some optimism about current and future efforts toward convergence: "While [previous] suggestions had little success in bringing about convergence in the last 20 years, now might be the time to start a concerted effort towards theory convergence in emotion science" (2022, 165). To this end, Scherer draws on Fiona Hibberd's (2019) suggestion regarding the productivity of a polythetic definition of emotion for the aim of eventual unification, and Gerd Gigerenzer's (2017) broad outline for a two-stage process of theory integration, to propose 1) a consensual, polythetic working definition of emotion and model, and 2) possible subsequent steps toward theory integration. One major aim in arguing for such a proposal is to "encourage the design of critical empirical studies to examine the proposed mechanisms" (Scherer 2022, 155). A second aim is "to encourage an unbiased discussion of the similarities and differences between concepts and mechanisms proposed by different theories, rather than theory integration or finding consensus at a low level" (165). These two aims, to some extent, echo Rainer Reisenzein's (2022) call for more theoretical psychology.

Specifically, Scherer argues that basic emotion theories, appraisal theories, social constructivist theories, and psychological constructionist theories share the following assumptions in common:

> That emotions 1) consist of an episodic process in response to a perceived event or situation of major significance, 2) which is characterized by recursive causal effects (forward and backwards) between several components that include the evaluation of the event in terms of its significance for the goals and values of the individual, 3) creating physiological reactions, motor expressions, and action tendencies and 4) that this process is partially accessible to consciousness, resulting in feelings that 5) can be categorized and subsequently labelled by the individual in terms of its subjective conceptual structure. (2022, 164)

Given these observations, Scherer proposes the following consensual, polythetic, working definition:

> The nature of an emotion can be summarised as follows: Individuals are exposed to stimuli, events, or situations generating an "overwhelming idea" of personal significance and potentially requiring some kind of action. This sets off a parallel, multi-level, and recursive process to determine, form, or construct the nature of this reaction. The first stage after elicitation is a subjective analysis and evaluation of eliciting stimulus/event/situation in terms of its consequences, implications, and requirements, involving a variety of attribution and appraisal mechanisms. The result of this evaluation process, which generally runs through several recursive cycles involving interactions between criteria, produces a synchronised effect on action tendencies and autonomic and somatic responses (including expressions). These in turn, are also evaluated by the appraisal system in the context of the results of situation evaluation until some degree of closure is achieved. The constantly changing evaluation results in the form of continuously updated schemata, which constitute the unconscious representation of an integrated feeling (*qualia*) of the emotional experience (core affect). Parts of this feeling representation can enter [consciousness] (Scherer, 2005b) and, especially when social communication of the felt experience seems desirable, give rise to categorization and eventually verbal labeling. (164–65)

Scherer also highlights the import of social, cultural, and historical factors that can shape an emotional episode, with the examples of valence appraisals, normative assessments, and the categorisation and labelling of emotional episodes (165). Furthermore, Scherer utilises his component process model of emotion as a means to integrate basic emotion theories, appraisal theories, social functional theories, social constructivist theories, and psychological constructionist theories (157–59).

I applaud Scherer's and Reisenzein's efforts to further advance theoretical research in the science of emotion, including interdisciplinary research, and I offer this article as a contribution toward such efforts. I also hope to encourage further discourse on the interdisciplinary concerns raised by Scherer, not only across disciplines, but also across publication venues, by responding to Scherer's call in this special issue of *Passion*. Scherer's proposal for a consensual, polythetic definition might seem to stop short of addressing the thematic question for this special issue: "Emotions—More Like Stars or Constellations?"[1] Yet, Scherer's

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1   The thematic question of this special issue may unwittingly lead to a lack of clarity or error in some responses. As I understand the question, the intent is to get at the debate between essentialist and non-essentialist theories of emotion by comparing essentialist positions to those that take emotions to be like stars, whereas non-essentialist positions are likened to those that take emotions to be more like constellations. One significant problem with this metaphor is that stellar taxonomy might more accurately be characterised as being drawn on epistemic considerations rather than any essentialist principles (see Ruphy 2010). To suggest that emotions are more like stars might then be, more accurately, to agree with a non-essentialist's position like de Sousa's (1984), which makes the question a non-starter. So, for the sake of the intent of this special issue, let us grant poetic license to the metaphor and assume that stars represent an essentialist position about what emotions are, whereas constellations represent a non-essentialist position.

proposal can be understood as a stepping-stone to addressing the concerns raised by this question. Granting that Scherer's proposed consensual definition, along with his proposed model, provides at least a starting point for the convergence and integration of basic emotion theories, appraisal theories, social constructivist (constructionist) theories, and psychological constructionist theories, it is also important to understand the potential limitations of this proposal, including for the unification of the science of emotion, as well as for the purpose of informing the design of empirical studies.

One approach to drawing out the implications of Scherer's proposal for a consensual, polythetic definition of emotion is to broaden our perspective on the categories of theories of emotion which we are willing to consider for our endeavours. For example, consider the categories of theories of emotion I proposed in my earlier works (2014; 2016; 2021). In these works, I recounted the contemporary landscape of theories of emotion from an interdisciplinary perspective, with a special emphasis on the disciplines of philosophy and psychology. I noted the similarities and differences between major theories of emotion within philosophical perspectives (e.g., cognitive theories, non-cognitive theories, social constructionist theories, prototype theories, and embodied perceptual theories) and psychological perspectives (e.g., basic emotion theories, appraisal theories, social constructivist theories, and psychological constructionist theories). By mapping out these various theories along the lines of two fundamental dimensions—a metaphysical dimension concerning the ontology of what emotions are, and a meta-semantic dimension concerning the significance of ordinary language to the science of emotion—I argued for fundamental distinctions between what I referred to as "realist theories," "instrumentalist theories," "eliminative-realist theories," and "eliminativist theories." These categories of theories of emotion constitute the current meta-semantic taxonomy of theories of emotion.[2] Given that Scherer's taxonomy of psychological categories of theories of emotion are subsumed by the meta-semantic taxonomy of theories of emotion, this taxonomy allows us to identify some limitations to Scherer's proposal, especially when the primary focus of concern is the unification of the science of emotion.

2. Fundamental Differences Between Theories of Emotion

The question about what the word "emotion" refers to can be understood as a question about whether the word "emotion" refers to a category of members that can possibly be independent of human conceptualisations (i.e., concrete things), members that are necessarily dependent on human conceptualisations (e.g., imaginations), or perhaps a mixture of both (e.g., artifacts), which would make that emotion category also necessarily dependent on human conceptualisations. The most important factor to attend to here, however, is the unifying principle, which is the principle that unifies the members of the emotion category into a single category and is thought to define that category.

Before we can determine exactly what kind of unifying principle is applicable, one must first understand what it means for the members that make up the *emotion* category to be concrete, imagined, or a combination of concrete and imagined particulars. In the first sense, the members of the category could possibly be mind-independent, and in the last two senses, they would necessarily be mind-dependent. In the first case, we can

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2 Although there are various alternative taxonomies of theories of emotion that one can appeal to for research purposes in the science of emotion (e.g., Griffiths 1997; Prinz 2004, Scarantino and de Sousa 2018; and Moors 2022), and each of these taxonomies serve their intended purposes, the uniqueness and the value of the meta-semantic taxonomy of theories of emotion is that, unlike these taxonomies of theories of emotion, the meta-semantic taxonomy of theories of emotion categorises theories in terms of fundamental differences such that each category is mutually exclusive with the others, except for very narrow, vague, borderline cases, and so are able to sufficiently track fundamental shifts in a theory.

refer to such particulars as objective kinds. In the two later cases, we can refer to such particulars as subjective kinds. The commitment to objective kinds versus subjective kinds can also be understood as a distinction that demarcates a realist theory of kinds from an anti-realist theory of kinds.[3] Such anti-realist theories of emotion can also be generally characterised as a kind of nominalism about emotion, which is a position that takes emotion words to be mere labels for categories.[4] The kind of realism and nominalism noted here can also be respectively related to the categories of essentialism and non-essentialism (see Hibberd 2019; Zachar 2022). Essentialist theories of emotion are theories of emotion that regard the referent of "emotion" to be an *objective kind* category. Non-essentialist theories, in contrast, regard the referent to be a *subjective kind* category. Furthermore, granting that *stars* metaphorically represent an essentialist position, we can also understand objective kind theorists to take emotions to be more like *stars*, whereas subjective kind theorists take emotions to be more like *constellations*.

Another related concern is the concern with the relationship between ordinary language and the technical language that experts use. For example, consider the word "water" and the word "H_2O." The first is considered an *ordinary language* word. We use the word in our everyday lives when we talk about the thing to which "water" refers. But experts, such as scientists and philosophers, might talk instead of "H_2O" rather than "water," and there are often questions as to whether experts and ordinary people are referring to the same category of things when they speak of "water."

Some emotion experts believe that their technical use of the word "emotion" refers to the same category of things to which the ordinary language use of the word "emotion" refers.[5] Consequently, they believe that they are speaking of the same kind of thing that ordinary people are speaking about when they speak of "emotion" or "emotions," and they believe that the work of the sciences is to help correct and refine ordinary language meanings. They believe that their scientific, technical term, which is shared with ordinary language, is a *trans-theoretical term* (i.e., it can be shared across theories, including ordinary language as a kind of theory).[6] Such an expert can be referred to as an *optimist about ordinary language emotion words*. They are optimistic about the intended referential meanings of ordinary language emotion words. They believe that appropriate ordinary and scientific uses of the word "emotion" share the same referent. Those who disagree with this presupposition can be referred to as *pessimists about ordinary language emotion words*. Pessimists believe that the referents of ordinary language emotion words are so different from what they are speaking about that they believe that ordinary people are referring to a different category of things compared to when they use the emotion words of their theoretical language.

Given the example I used about "water" and "H_2O," you might be more willing to side with the pessimists about the word "emotion" because it seems clear to you that *water* is not H_2O, and especially if by "H_2O" we mean *pure H_2O* and *water* is not *pure H_2O*. But now consider the ordinary English word "electricity." Does the ordinary English word "electricity" refer to the same thing as the technical word "electricity," when it is used by a physicist, engineer, or philosopher? This might be a trickier question to answer, and perhaps you would be more willing to side with the optimist when thinking about the word "electricity." This point about the relationship between ordinary language words and technical scientific words can also be related to questions about the meanings

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3 See Tuomas Tahko 2021 for an interesting discussion of realism and anti-realism, as well as the criteria of mind-independence for characterising natural kinds.
4 For an interesting discussion of a trope nominalist theory of natural kinds, see Markku Keinänen 2015.
5 For a discussion of the relationship between expert and ordinary knowledge, see Fodor 1994. Hibberd (2019) also mentions this fact.
6 This term was coined by Hilary Putnam (1973).

of words across time, within the context of ordinary or scientific languages, and even about a word and its translation into a different language. For example, consider the word "whale." There was a time, long ago, when people (including experts) thought whales were fish. We now know that whales are mammals. In either the context of comparing only the meanings of the ordinary English word "whale" across time, or comparing only the meanings of the technical scientific word "*Cetacea*" across time, would you say that ordinary people or scientists were referring to the same category of things from one time to another?

If we consider whether an emotion expert would regard emotions to be an objective kind or a subjective kind, and we add to this what an emotion expert believes about the relationship between their technical, scientific emotion words and ordinary language emotion words, then we can construct a matrix with a total of four different fundamental categories of expert perspectives on (or frameworks about) what emotions are: *realism*, *instrumentalism*, *eliminative-realism*, and *eliminativism* (Mun 2021).

Realists are optimists about ordinary language emotion words, and believe that the word "emotion" refers to an objective kind category. Specifically, they believe that our experiences of different emotions (typically) share certain fundamental features, such as being products of an evolutionarily evolved system in which our mental processes (e.g., perceptions, thoughts, beliefs, and desires) are related to our physiological processes (e.g., the activation of our autonomic nervous system and motor cortex) in such a way that allows us to address challenges in the world for the purpose of survival. To this extent, one might say that realists believe that beings that have emotions have an *emotion system*. When thinking about an emotion system, you might analogously consider how beings that have perceptions have a perceptual system or how beings that digest food have a digestive system. To a lesser extent, one might say that the *emotion* category is like the *cat* category, or is like the category of *stars*: the members of the category are necessarily concrete particulars. I will further elaborate on this point in §5. For examples in psychology, see Paul Ekman's (2003) basic emotion theory, Richard Lazarus's (1991) appraisal theory, and Klaus Scherer's (1982; 1987; 2001; 2005; 2009; 2012; 2019) component process theory. For examples in philosophy, see Jesse J. Prinz's (2004) embodied appraisal theory of emotion.

Instrumentalists are also optimists about ordinary language emotion words, but they believe that the word "emotion" refers to a subjective kind category. To this extent, instrumentalist theories are logically contrary to realist theories: they can both be false at the same time, but only one can be true in relation to the other. Instrumentalists agree that ordinary people and experts are all speaking of the same kind of things when we use shared emotion words, but they deny that emotional beings have an evolutionarily evolved emotion system. They believe that emotions are instead products of different systems (e.g., the perceptual system, conative system, doxastic system, motor system, autonomic nervous system, etc.) working independently to respond to challenges in the world, without the need for an overarching emotion system. Consequently, emotion words, such as "emotion," refer to a category in which the members of that category are ultimately dependent on human conceptualisations (i.e., arbitrary ways in which human beings think about emotions) since it is these ways of thinking about emotions that are ultimately the basis on which emotional experiences are categorised. In short, instrumentalists believe that the members of the *emotion* category are something akin to imaginative projections (i.e., they are social constructions), or are more like *constellations*. For examples in psychology, see James Averill's (1980; 1986; 1997; 2004) social constructivist theory of emotion and Lisa Barrett's (2017a; 2017b) conceptual act theory. For philosophical examples, see Ronald de Sousa's (1987) theory of patterns of salience, Martha Nussbaum's (2001; 2016) theory of eudaimonistic assent, and Claire Armon-Jones's (1986) social constructionist theory of emotion.

The opposite, or logical contradictory, of instrumentalism is *eliminative-realism*. Whereas an instrumentalist is a subjective-kind theorist who is also an optimist about ordinary language emotion words, an eliminative-realist is an objective-kind theorist who is also a pessimist about ordinary language emotion words. Eliminative-realists believe that emotions can at least be categorised into distinct kinds of emotion systems (e.g., the panic system, fear system, rage system, seeking system, lust system, care system, and play system), if not an overarching emotion system. So, they believe that at least certain emotion types are objective kinds. They, like realists, believe that emotions are like *cats* or *stars*. Yet, they deny that the emotion words that experts use refer to the same things as the emotion words used by ordinary people. So, they are pessimists about ordinary language emotion words. One interesting consequence is that, although eliminative-realists believe that the *emotion* category is ultimately grounded in members that are more like *cats* or *stars* than *unicorns* or *constellations*, eliminative-realists also believe that the ordinary language word "emotion" does not refer to the same kind of thing that they are referring to when they speak of emotions. Consequently, instrumentalism and eliminative-realism have opposing truth-values: if instrumentalism is true, then eliminative-realism must be false, and *vice versa*; they cannot both be true or both be false at the same time. They are also logically contrary to realist theories, as well as eliminativist theories of emotion, but for different reasons. As with basic emotion theories, they are objective kind theories; as with eliminativist theories, they are pessimistic about ordinary language. Jaak Panksepp's (1998; 2008) basic emotion theory is a psychological eliminative-realist theory, and Paul Griffiths (1997) and Scarantino (2012; Scarantino and Griffiths 2011) provide philosophical examples.

Eliminativist theories are contradictory to realist theories. Eliminativists are pessimists about ordinary language emotion words, and they believe that how emotional experiences get categorised ultimately depends on human conceptualisations. Their reason for being pessimists about ordinary language emotion words are the same as the eliminative-realist's: they believe that ordinary language uses of emotion words are too imprecise to be useful for scientific endeavours. Their reason for believing that emotions are subjective kinds is the same as the instrumentalist's. They don't believe that there is any such thing as an emotion system or different types of emotion systems. In other words, eliminativists believe that the *emotion* category is constituted by members that are more like imaginative projections (or *constellations*) than *cats* (or *stars*). As such, eliminativist theories are also contrary to eliminative-realist theories, as well as instrumentalist theories, but for different reasons. James Russell's (2003; 2009; 2010; 2012) psychological constructionist theory is a psychological eliminativist theory, and I will later argue that George Mandler's ([1975] 1984) psychological social constructivist theory is also an exemplar of eliminative theories of emotion.[7, 8]

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7 Mandler's social constructivist theory, however, might be most accurately characterised as being positioned in the vague area between instrumentalism and eliminativism, and this is mostly a consequence of his pessimism about ordinary language.

8 As far as I am aware, there are no eliminativist philosophical theories of emotion. I suspect that this is mostly because such a position is especially fruitful for empirical approaches that aim to falsify alternative theories, and especially difficult for philosophical approaches that take a more logical, argumentative approach. I can imagine the development of such a philosophical position, however, especially if one aligns the primary aim of such an endeavour with the critical aim of eliminativist psychological approaches, although the success of such an endeavour might require an especially keen philosopher. If they succeed, however, their impact would be immensely significant. One especially worth-while initial pursuit for such an endeavour might be to draw out the details of how such a critical aim might be pursued, especially given the fact that eliminativist theories do not share the same object of inquiry as the alternative theories which they would be aiming to falsify. I address how falsification might occur between realists and instrumentalists in §4; yet I do not similarly address how eliminativists might do so. Psychological eliminativist theorists have also sought to falsify realist approaches (e.g., DiGirolamo and Russell 2017). In any case, I will leave further considerations on these concerns for some future time.

3. Implications of the Meta-Semantic Taxonomy of Theories of Emotion

Given these four fundamental categories of theories of emotion, one can observe that the psychological taxa of theories of emotion discussed by Scherer (2022)—basic emotion theories, appraisal theories, social constructivist (constructionist) theories, and psychological constructionist theories—are subsumed by the meta-semantic taxonomy of theories of emotion. Both basic emotion theories (such as Ekman's) and appraisal theories (such as Lazarus's and Scherer's) are realist theories. Social constructivist theories (such as Averill's) and some psychological constructionist theories (such as Barrett's) are instrumentalist theories, whereas other psychological constructionist theories (such as Russell's) are eliminativist theories. Given these categorisations, according to the meta-semantic taxonomy, there are certain logical relations between these theories that would demarcate at least some limits to moving beyond the convergence on Scherer's proposed consensual, polythetic, working definition and component process model. To more clearly understand what these limits are, I presuppose the acceptance of Scherer's proposed definition and model, as a means for integrating basic emotion theories, appraisal theories, social constructivist theories, and psychological constructionist theories. I then explore at least some of the possible limits for full theory integration, and therefore the unification of theories of emotion.

As realist theories, there should be no problem with the full integration of basic emotion theories and appraisal theories, since these two psychological categories of theories of emotion are fundamentally the same. To some extent, one can trace the contemporary history of the integration of these two kinds of psychological theories through the history of the convergence between Ekman's basic emotion theory and Lazarus's cognitive-relational theory (see Lazarus 1990; Ekman 1999), as well as to Stanley Schacter and Jerome Singer's (1962) contributions, and the debates between Lazarus, Mandler, and Robert Zajonc (see Bozinovski 2018; Mandler 1990). The debates which led to the convergence between these two kinds of theories can be summarised as concerning the necessity of cognitive, non-automatic appraisals as aspects of the elicitation of emotions. The result of the convergence can be understood in terms of the acceptance of at least two kinds of elicitation processes by both kinds of frameworks. Given the foregoing discussion, to the extent that Scherer's component process model is a model for his appraisal theory of emotion, it should not be a surprise that basic emotion theories and appraisal theories are generally consistent with Scherer's proposed consensual definition and component process model (Scherer 2022, 161–62). One noteworthy observation is that such a convergence did not require an agreed upon, consensual, working definition, including an operational one, that was shared between the two kinds of theories, but instead a shared object of inquiry. As realist theories, both basic emotion theories and appraisal theories can be understood as ultimately sharing the same referent for the theoretical term "emotion." Such a condition is secured by the shared assumptions that emotions constitute an objective kind and the commitment that the language of their science shares the same referents as the referents of ordinary language emotion words (i.e., optimism about ordinary language).

The convergence of social constructivist theories on Scherer's consensual definition and model may also seem unproblematic. Scherer notes Averill's suggested definition of emotions as socially constructed syndromes or transitory roles, and he believes that such accounts might unproblematically converge with his proposed definition and model. He observes that such an account has been further developed in Dacher Keltner and Jonathan Haidt's (1999) social functionalist account, and that the focus of Mandler's (1990) social constructivist account is the role of cognitive schemata in determining an emotional experience (2022, 162). These theories can be related to the multi-level appraisal aspect of Scherer's proposed consensual definition and model, or they can be regarded as focusing primarily on the dynamic social aspects of emotion, which are essentially

external to a subject's emotional experience, although these external factors and relations would be closely related (as with Mandler's, and Keltner and Haidt's accounts). Let us consider, however, the extent to which social constructivist theories can be integrated with basic emotion theories and appraisal theories, beyond their convergence on Scherer's proposed consensual definition and model.

The ease with which Keltner and Haidt's social functional account can converge with Scherer's proposed consensual definition and model is predicted by the meta-semantic taxonomy of theories of emotion. This is because, although Keltner and Haidt's social functional account is regarded as a social constructivist account, it is also a realist account. This is primarily because Keltner and Haidt's account also accept that emotions are objective kinds, and that ordinary language emotion words are transtheoretical with the emotion words of their theoretical language. Thus, for social functional accounts like Keltner and Haidt's, theory integration can move beyond Scherer's proposed consensual definition and model. In short, as with basic emotion theories and appraisal theories, full integration of these theories should not be problematic. A problem arises, however, when we consider the degree to which Averill and Mandler's accounts can be fully integrated with Scherer's component process theory, beyond convergence on Scherer's proposed consensual definition and model.

Although one might regard Averill's, Mandler's, and Keltner and Haidt's theories as constructivist (or constructionist) theories (Scherer 2022, 162), in accordance with their psychological taxa, one ought to note that while Keltner and Haidt's theory accepts the assumption that "emotions are thought of as relatively automatic, and rapid responses" (1999, 508), both Averill and Mandler's accounts reject this Jamesian premise. As Averill explains,

> In cognitive terms, emotions may be conceived of as belief systems or schemas that guide the appraisal of situations, the organization of responses and self-monitoring (interpretation) of behaviour. When conceived in this way, the question arises, What is the source of emotional schemas? The more traditional answer to this question is that emotional schemas became hardwired into the nervous system during the course of evolution—that they represent innate affect programmes (Izard, 1977; Tomkins, 1981). By contrast, a constructivist view assumes that emotional schemas are the internal representation of social norms or rules. (1986, 100)

Mandler notes that James's "particular constructions depended entirely on patterns of visceral and muscular feedback and are no longer found acceptable" (1990, 22; see also Mandler [1975] 1984).

The rejection of this Jamesian principle sets Averill's social constructivist theory apart from basic emotion and appraisal theories, although, like basic emotion and appraisal theories, his theory is optimistic about ordinary language emotion words (Mun 2021, 45–48). This makes Averill's theory an instrumentalist theory, rather than a realist theory, according to the meta-semantic taxonomy of theories of emotion. Social constructivist theories such as Averill's are, therefore, logically contrary to appraisal theories (such as Scherer's component process theory), as indicated by the meta-semantic taxonomy. Thus, full integration between these kinds of social constructivist theories (e.g., Averill's) and appraisal theories (e.g., Scherer's and Lazarus's), and other social constructionist theories (e.g., Keltner and Haidt's), would not be possible without a fundamental change in at least one of the theories.

This conclusion is an implication of the logical relations that hold between realist and instrumentalist theories, which place rational constraints on the design of empirical research. That both realist theories and instrumentalist theories may converge on Scherer's consensual definition and model speaks to the possibility

that both realist theories and instrumentalist theories may be false. Thus, although empirical research based on Scherer's proposed model would be fruitful, especially in possibly falsifying both realist and instrumentalist theories, such research would not get at concerns regarding the fundamental nature of emotion on which realists and instrumentalists disagree. When theory integration is pursued beyond Scherer's consensual definition and model, one should observe that appraisal theories (along with basic emotion theories and other realist theories, such as Keltner and Haidt's) would ultimately be at odds with social constructivist theories (such as Averill's).

One way to draw out the logical constraints on empirical research is to consider Kristen Lindquist et al.'s (2022) social constructivist (constructionist) approach. Lindquist et al. present a cultural evolutionary framework that takes emotions to be cultural artifacts that evolved through social transmission within and between groups, which are underpinned by neurological mechanisms linked to physiological and action regulation (Lindquist et al. 2022, 670).[9] One consequence of Lindquist et al.'s framework is that it predominantly focuses on empirical research on adult subjects, including in the area of emotion concepts (e.g., Satpute et al. 2016; Brooks et al. 2019), while also admitting that linguistic differences may not map on to experiential differences (672). Lindquist et al.'s framework, which is an instrumentalist framework, is fairly consistent with realist frameworks with respect to adult human emotions. That this is the case can be explained by the fact that realist theories do not necessarily deny that emotions are socially constructed. This is also consistent with the logical implication that the theories are contraries: both realist and instrumentalist theories can be wrong about the social construction of emotions.

Where Lindquist et al.'s theory diverges from realist theories is that it claims that emotions are *only* artifacts. As with other instrumentalist views, they reject anything like an emotion system, including for specific emotion types. Accordingly, one might be able to adjudicate between realist theories (such as Ekman's, Scherer's, and Keltner and Haidt's) and instrumentalist theories (such as Lindquist et al.'s and Averill's) by focusing on identifying possible innate aspects of an emotion system in infancy, as well as their developmental trajectory into adult emotions. One place to start is with research on infant emotion perceptions (see Nelson and Leppänen 2009). I will not go into detail here, especially since there is a paucity of empirical research on infant emotion perception, including in cross-cultural research, but one might consider Carlijn van den Boomen et al.'s (2019) results, which found that infants between 9–10 months are better able to discriminate happy faces from angry and neutral faces.

If one assumes that an emotion perception system is a significant aspect of an emotion system, and that system comes online in early infancy (after approximately 7 months), then an explanation as to why infants might first develop the ability to perceive positive emotions from angry or neutral emotions seems forthcoming: the perception of positive emotions is necessary for engendering social bonds (such as attachment, trust, etc.), which are necessary preconditions for socialisation (including norm and concept acquisition), and are therefore secured by evolution. If emotions are entirely socially constructed as artifacts and require the input of emotion concepts, the question remains how infants between 9–10 months can discriminate positive from negative and neutral emotions *at all*.

Although, an explanation for why they might initially discriminate positive from negative and neutral emotions might seem to be forthcoming: instrumentalists might conjecture that the rate of exposure to positive versus negative emotion faces would explain this difference. Yet, a problem arises when one considers

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9 A cultural evolutionary framework for emotion need not, however, be an instrumentalist approach. For a sketch of a realist approach, see Mun 2022.

that such discrimination can occur as early as 9–10 months.[10] What explains such discerning abilities at this age if not an innate, evolutionarily evolved system? Thus, although instrumental social constructivist theories share some overlapping considerations with realist theories, such as basic emotion theories and appraisal theories, they are fundamentally distinct kinds of theories. Accordingly, full theory integration between these theories would not be possible without a fundamental theory change in at least one of the theories. A similar conclusion can be drawn for Barrett's conceptual act theory (2017a; 2017b). Although Barrett's theory is regarded as a psychological constructionist theory, according to the psychological taxa of theories of emotion it is an instrumentalist theory (see Mun 2021 for a detailed explanation).

Russell's psychological constructionist theory, unlike Barrett's theory, is an eliminative theory. As such, it is logically contrary to instrumentalist theories, such as Barrett's, Lindquist et al.'s, and Averill's (see Mun 2021 for a detailed explanation; see also Zachar 2022). Although Russell's theory will overlap with instrumentalist theories, especially with respect to claims about the subjective kind nature of emotional experiences, Russell's theory also denies the existence of emotions. According to Russell, emotions are not simply something like imagined projections, but they nonetheless do not constitute a legitimate psychological category for scientific research. What *do* constitute psychologically legitimate categories, according to Russell, are the physiological (core affect), behavioural (actions/reflexes), and narrative (scripts/concepts) aspects that constitute what Russell refers to as an emotional episode or a meta-emotional experience. These are the elements of Russell's psychological constructionist theory, as an eliminativist theory, that overlap with instrumentalist theories such as Barrett's, Lindquest et al.'s, and Averill's. Thus, along the lines of these ontological concerns, both kinds of theories may be proven false.

Russell's theory, however, is also pessimistic about ordinary language emotion words. It takes ordinary language to misidentify the referents of ordinary language emotion words, and as such severs the connection between his theoretical language of emotion and ordinary language emotion words, unlike instrumentalist theories. The result is a rejection of the emotion category as a legitimate category for scientific study, which stands in opposition to the instrumentalist's claim that the emotion category constitutes a legitimate category for scientific research. Thus, as with realist and instrumentalist theories, instrumentalist and eliminativist theories can both be simultaneously proven false, yet only one of the two kinds can be true. A similar conclusion can also be drawn about Mandler's social constructivist theory ([1975] 1984). As with Russell's psychological constructionist theory, Mandler's social constructivist theory is pessimistic about ordinary language emotion words—in contrast to other social constructivist theories (e.g., Averill's)[11]— and, also like Russell's psychological constructionist theory, it holds that emotions are subjective kinds (similar to instrumentalist theories). As such, Mandler's social constructivist theory is more closely aligned with psychological constructionist theories like Russell's, rather than those like Barrett's and other social constructivist theories (such as Averill's).

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10 Such questions might be resolved through additional empirical research, including cross-cultural research comparing infants' abilities to discriminate between positive and negative emotion between cultures that encourage smiling and those that do not (see Krys et al. 2016, although in such research the rate at which people smile at infants should be specifically considered).

11 In chapter one, in the section titled "Psychology and Common Language," Mandler discusses the import of ordinary language to the science of emotion. One might conclude from parts of this discussion that Mandler's theory ought to be regarded as an instrumentalist theory. Yet the parts of his discussion which suggest this correspond more closely with what Mun referred to as the *fundamental base for interdisciplinary inquiry in the science of emotion* (Base^e), which is a fundamental principle to which any adequate theory of emotion should adhere (2021, ch. 4). Other parts of Mandler's discussion, however, make clear that he is a pessimist about ordinary language emotion words: "Those who have looked to ordinary language as the royal road to developing a satisfactory scientific language (both syntactically and semantically) often fail to apply a fundamental distinction in the primary *function* of these two languages" (Mandler [1975] 1984, 7).

One way to draw out the implications of these logical constraints on empirical design is to consider the phenomenon of pretence emotions (see Mun 2021). For example, one might consider the implication of emerging empirical research on real and fake emotions (e.g., Saxen et al. 2017; Jia et al. 2021).[12] Granting that pretence emotions may constitute a complex category of experiences—requiring the acceptance of degrees between real and fictitious emotions (Pugmire 1994), as well as the teasing apart of emotional responses to fictions (Radford and Weston 1975) and genuine emotional responses—empirical research on the neural–physiological differences between genuine and pretence emotions might lead to further progress for realist theories. Russell's eliminativist theory also does not provide any metaphysically grounded theoretical constraints against accepting pretence emotions as instances of emotion. One can also say something similar about Mandler's social constructivist account.[13] So, it might be difficult for Russell's eliminativist theory to make sense of the results of empirical research which aims to distinguish real emotions from pretence emotions.

One might also conclude that instrumentalists would have an equally difficult time as eliminativists in making sense of pretence emotions. As with eliminativist theories, which take emotions to be subjective kinds, instrumentalists also regard emotions as something like imagined projections. Thus, they would have an equally difficult time making sense of the distinction between genuine and pretence emotions, which is currently being borne out by emerging research. Unlike eliminativists, however, instrumentalists can fall back on ordinary language, given their optimism about ordinary language, to at least restrict the instances of the category under study. According to ordinary language, pretence emotions are not genuine cases of emotions. So, such experiences can be readily rejected by instrumentalists as constituting members of the emotion category. In contrast, realist theories would have the most resources to make sense of this distinction, once concerns about vagueness are bracketed for later consideration.[14] What distinguishes a real or genuine emotion from a non-genuine pretence emotion would be the activation of the emotion system, whatever it may be.

Another way to draw out the logical constraints on empirical design between realist and eliminativist theories is to consider the difference between Mandler's appeal to likings in support of his rejection of the Jamesian premise that emotions are discrete patterns of behaviour, experience, and neural activity. Mandler relies primarily on observations that automatic "affective" reactions are typically slower than cognitive reactions to argue against the claim that emotions can bypass cognitions (1990, 34–38). Yet, if we consider Scherer's Table 1,

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12 On a tangential note, it might also be important for researchers to consider the ethical implications of future technology that may be developed on the basis of such empirical research. Consider, for example, the warning Barrett conveyed regarding the reliance on emotional responses in the U.S. judicial system (Barrett 2017a), and the potential detrimental effect that such technology might have on marginalised populations due to either coding bias or an undiagnosed affective disability.

13 Mandler does on occasion suggest that behaviours—which may be the kind of category under which pretence behaviours might be placed—ought not to be taken as emotions: "The behavior itself, is not to be considered emotional within the context of this model" ([1975] 1984, 121). As Mandler continues, he elaborates by noting that it is the "cognitive evaluations, which in turn determine the phenomenal experience of emotion" (121), and that "some cognitive interpretation of the environment produces arousal, and the perception of that arousal together with some cognition of the situation generates emotional experience" (123). Arousal is therefore a necessary condition, yet not a sufficient one, for an emotional experience, and arousal and cognitive evaluation are jointly necessary and sufficient. An emotion system, however, is not posited to causally connect relevant arousals to relevant cognitive evaluations, and it is this causal untethering which leaves open the possibility of Mandler's theory admitting pretence emotions as instances of emotion. (One should also note the striking similarities between Mandler's theory and Russell's at this point.)

14 Vagueness, although interesting and perhaps also unavoidable for the science of emotion—not only given that any science is ultimately a human endeavour and the emotions that are of central concern are ultimately human experiences—need not be of too much concern for the time being since, even granting vagueness, there are in fact clearly identifiable cases of genuine emotions and non-genuine, pretence emotions (such as those induced by method acting).

of the "design feature delimitation of different affective states/dispositions," likings are not regarded as emotions. They are instead categorically distinguished from emotions, as attitudes. These facts demonstrate how realist theories are logically contradictory with eliminativist theories. Realist and eliminativist theories have opposing truth-values: when one is true the other must be false. Accordingly, the full integration of theories, beyond a convergence on Scherer's consensual definition and model, would not be possible between realist theories and eliminativist theories, without at least some fundamental change in one of these theories.

4. A Pluralist Approach to a Unified Science of Emotion

I introduced the meta-semantic taxonomy of theories of emotion, explained how it can be related to aspects of the psychological taxonomy of theories of emotion, and illustrated how the meta-semantic taxonomy can clarify the fundamental differences between theories of emotion beyond the discussed aspects of the psychological taxonomy of theories of emotion. I also demonstrated how the logical relations between theories of emotion implied by the meta-semantic taxonomy lead to substantive constraints on empirical design, especially when one considers the possibility of theory integration beyond Scherer's proposed consensual definition. Metaphysical claims about whether emotions are objective or subjective kinds, and claims about the import of ordinary language emotion words in the science of emotion, not only have significant theoretical implications, but these implications can be traced to questions about the constitution of the object of study, which ultimately informs the design of empirical research.

Although vagueness remains about exactly which instances of experience constitute a realist's (or any other theoretical kind's) category of emotion,[15] one can delineate a realist's object of study from an instrumentalist's object of study (e.g., a category admitting instances of human infant emotions versus one that does not). Consequently, instrumentalist theories may lack the ontological resources to adequately explain phenomena associated with infant emotions (e.g., infant emotion recognition). An eliminativist's object of study can also be delineated from a realist's and instrumentalist's object of study to the extent that the eliminativist's category of *emotion* (or more accurately, emotional episodes) would admit instances that both a realist and instrumentalist would have the resources to reject as appropriate instances of their object of study (e.g., pretence emotions and likings[16]).

We were also able to observe the differential effects of the fundamental metaphysical claims regarding whether emotions are an objective or subjective kind, and the fundamental meta-semantic claims about whether ordinary language emotion words are or are not transtheoretical words, especially by observing the implications that these differences between instrumentalist and eliminativist theories of emotion have on empirical design. Although both instrumentalists and eliminativists lack the theoretical resources to reject pretence emotions and likings as instances of emotion from the metaphysical perspective, instrumentalists can reject such phenomena as legitimate instances of emotion, given their optimism about ordinary language

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15 That there may be vagueness with objective kind categories may not be very problematic. Given the complexity of emotion, vagueness is to be expected, especially at this point in our scientific endeavours. Furthermore, it just might be an objective fact that nature has fuzzy joints. It may also not be very problematic that objective kinds are interest relative. What matters is not whether objective kinds are interests relative, but whether they need be.

16 I take it that there is considerable vagueness in ordinary language as to whether likings are emotions.

emotion words (i.e., from a meta-semantic perspective).[17] This is especially significant because it allows us to further understand the significance of optimism about ordinary language emotion words for the science of emotion.

De Sousa (1987) associates what I refer to as realism with the *modern view*, which takes natural kind names (e.g., emotion) to be rigid designators. Saul Kripke ([1972] 1980) is the philosopher most often identified with the notion of rigid designation. For Kripke, proper names and natural kind terms, as eloquently recounted by de Sousa, get their reference by ostension (1987, 563). I argue here that one might also associate rigid designation with optimism about ordinary language emotion words. Accordingly, realists and instrumentalists might be said to share similar intuitions about which instances in the world are and are not emotions,[18] but they disagree on their metaphysical assumption about those instances (whether they are objective or subjective kinds).

For Kripke, the rigid designation of natural kind terms, such as *water*, *gold*, *heat*, *tiger*, and *cow*, were especially significant because this notion offered conditions for falsification. Rigid designation was a method for fixing the referent of a term, even when the essential characteristics of the referent were unknown at the time of its fixing, and identified only in virtue of a stipulative definition. Once a referent is fixed, identifying the nature of the referent is a matter of scientific discovery, which might result in the falsification of the stipulative definition. As Kripke explains with his example of *cat*: "Cats might turn out to be automata, or strange demons ... planted by a magician. Suppose they turned out to be a species of demons. Then ... the inclination is to say, not that they there turned out to be no cats, but that cats have turned out not to be animals as we originally supposed" ([1972] 1980, 122; see also Kripke 2011). Thus, if one associates optimism about ordinary language emotion words with Kripke's notion of rigid designation, one should notice that realists and instrumentalists have placed opposing metaphysical bets on future scientific discoveries about what exactly emotions are, and at least some arguments on one side can be taken as putatively falsifying the other. Yet, as contrary theories, these falsifying results are limited, since both kinds of theories can be proven false, while only one kind between the two can be proven true. And this is where contradictory theories make their contribution to the overall scientific enterprise and aim toward unification. Although at least seemingly talking past each other,[19] contradictory theories are theoretical alternatives that would be welcomed in light of the possibility that both realist and instrumentalist theories are proven false, while also serving as a means for falsifying realist or instrumentalist theories.

Such a conclusion runs counter to Mandler's conclusion about the productivity of ordinary language for the science of emotion: "To assert that such a truth is available by a proper examination of our phenomenal selves or by the proper analysis of language is, at least, a hinderance and, at worst, a wall that keeps us from playing that most productive game—science" ([1975] 1984, 7). And one might attempt to argue that this does not bode well for the pessimist about ordinary language. One might even go so far as to argue that the crisis in the science of emotion is a consequence of such untethering. Such a conclusion, however, would fail to see the forest for the trees. One might instead conclude that on the waters of the science of emotion, guided by their relevant lights (stars or constellations), realist and instrumentalist theories cast the narrowest methodological net with their object of study, and eliminative-realist and eliminative theories can cast wider nets. These similarities

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17 One might provide a similar analysis of eliminative-realist positions, but I do not do so here since the primary theories of interest for this paper are the psychological basic emotion theories, appraisal theories, social functional theories, social constructivist theories, and psychological constructionist theories.

18 Although there might be some vagueness with respect to cases like likings.

19 Contradictory theories do not necessarily disagree on which particular instances of an experience make up the category of study.

and differences, however, may be necessary for the productivity of the science of emotion. Once theories are categorised in accordance with their fundamental differences, one can more clearly understand how each kind of theory takes a logical position of falsification in relation to the other three kinds, so as to contribute to the joint, cooperative effort in understanding the complexities of emotion, and to ultimately arrive at a true, unified theory of emotion. Thus, each kind of theory makes a unique and necessary contribution to the science of emotion, and as such, although theory integration to the extent proposed by Scherer may be fruitful, moving beyond that extent, without fundamental shifts, may ultimately be impossible in the science of emotion.

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