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1 A survey of emotion theories and their relevance to language research

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Abstract: The topics of language and emotion are studied by very different scientific disciplines, of which their respective members rarely interact. At the same time, the everyday use of language, whether colloquial or professional, is richly intertwined with, and dependent on, emotion. This suggests that it will be useful for language researchers to at least have a feel for what is going on in emotion research. This chapter provides an overview of current trends in emotion science for language researchers, so that they will be in a better position to consider, design, interpret, or discuss research at the intersection of these two fields. After explaining why emotion science is relevant to language research, I discuss four currently influential views on emotion: the basic emotions perspective, the motivational perspective, the component process model, and the psychological construction perspective. Next, I define a metamodel of emotion to highlight what these views have in common, as well as where they differ. I end by proposing a research agenda for affective language science. Although having an interface with emotion is not what makes language “special”, understanding emotion may well help language research advance.

1 Introduction

Language is a beautiful system. It serves as an infinitely extendable discrete combinatorial coding system that allows members of the species *Homo Sapiens* to refer to real or imaginary states of affairs with incredible precision. The underlying capabilities for ostensive-inferential communication and interaction (Levinson 2006; Sperber and Wilson 1995; Tomasello 2008) are equally impressive. There are many interesting questions to be asked about this specific machinery, e.g., about the nature of the code and how it can change over time, about what people do with it and how their brains support that, and about how these wonderful capabilities evolved in our species and/or develop during acquisition.

Researchers working in subfields such as language change, syntax, or neurolinguistics usually know about some of the work in other subfields as well, in part because of the typical composition of training programs in linguistics. Every now and then, however, lan-

guage researchers encounter questions for which their training has not prepared them. For example, when working on prediction during language comprehension, I got involved in research on how a person's emotional mood might influence such prediction. The bigger question was about the extent to which language processing is context-dependent rather than “modularly encapsulated”, a question that emerged from the internal dynamics of language science. However, I suddenly also needed to work with mood.

That seemed easy. After all, we all know what mood is: it's that good or bad background feeling that you have as soon as you get out of bed in the morning and that can change as the day progresses, by such things as breakfast, music, your inbox, people, the weather, or a movie. So, in the study that we designed, we used movie clips to induce a good or bad mood in our participants, checked our manipulation via a self-report questionnaire, and had our participants read some unrelated bits of language to see whether mood would influence prediction during reading. It did (van Berkum et al. 2013). However, looking back, I didn't really know what I was doing, emotion-wise. For instance, at the time we designed the study, I had not fully realized that our movie clips might also trigger short-lived emotions, rather than longer-lasting moods, and that these emotions could be more articulate than just positive or negative. Also, I was unaware of the fact that many components of emotion can be unconscious, and as such beyond the reach of verbal self-report. I think none of this was detrimental to the study. At the same time, I would have liked to have known about these things, as it could have improved our research.

The aim of this chapter is to provide an overview of current ideas in emotion science for language researchers, to ensure that they are in a better position to design or interpret research at the intersection of language and emotion. The focus will be on theory. Emotion science is a huge field, and the best way to compress it for current purposes is to make use of the data compression devices that emotion researchers have themselves come up with (i.e., their theories). I will not give a *comprehensive* overview of the theoretical landscape, and refer the reader to other works for this, in particular Scarantino and de Sousa (2021) and Fox, Lapate, Shackman and Davidson (2018). Instead, what I will do here is to highlight those aspects of that landscape that I think might be of relevance to language researchers. I begin by exploring why emotion research is relevant to language science. Next, I describe four influential perspectives on emotion, highlight shared ideas as well as some of the theoretical issues that are still debated, and discuss what I take to be plausible developments in that field. I conclude by proposing a research agenda for affective language science.

2 Why care about emotion in language research?

Why would it be useful for language researchers to know about theories of emotion developed in emotion science? At least four reasons come to mind.

1. Argument from current practice in language research. One reason has just been illustrated, which is that some language researchers already ask about the relation between language and emotion. In the same way that answering questions about language and

social identity, about language and spatial thinking, or about language and the cerebellum will benefit from some knowledge of social identity, spatial thinking, or the cerebellum, respectively, answering questions about language and emotion will benefit from knowledge of emotion. Unfortunately, though, and in contrast to, say, the cerebellum, emotion is a topic that everybody knows a lot about already – after all, emotion is a concept that people use every day to explain why they and others do what they do. As discussed in Section 3, though, the intuitions about emotion that work well in everyday life are not always a good basis to ground scientific research in. For example, the implicit intuition I had when designing the mood experiment, that emotional phenomena are by definition always conscious phenomena, is simply incorrect.

2. Argument from current practice in emotion research. A second reason why ideas in emotion science might be of interest to language researchers is that a number of recent theories of emotion and its expression suggest deep ties with language. According to one influential theory (the *Theory of Constructed Emotion*, Barrett 2017b), for example, words critically shape how we experience emotion and perceive it in others. Another recent theory (the *Theory of Affective Pragmatics*, Scarantino 2017a) proposes that emotional expressions are comparable to Speech Acts, to such an extent that they might be evolutionary precursors to some of our linguistic-pragmatic abilities. These theories might be wrong, of course. But right now, it seems useful that at least some language researchers know this is going on.

3. Argument from the power of emotion. Research on the relationship between emotion and cognition has shown that emotion, in its conscious and unconscious forms, controls or modulates much of our perception, attention, memory, reasoning, and decision-making (see, e.g., Barrett, Lewis, and Haviland-Jones 2016; Damasio 1994; Fox et al. 2018; Gigerenzer 2007; Greene 2014; Haidt 2012; Kahneman 2011; Panksepp and Biven 2012; Pessoa 2015), and, as a consequence, much of our behavior. As will be seen in Section 3, this is exactly what emotion is supposed to do. However, cognitive processes such as perception, attention, memory, reasoning, and choice are also at the heart of language production, language comprehension, and language acquisition. This logically implies that the latter processes will be controlled or modulated by emotion as well (van Berkum 2018, 2019).

4. Argument from the nature of human sociality. Language is one of the pillars of human sociality, a sociality that is itself deeply emotional. Just like other mammals, we care a lot about such things as dominance, family, and sex. Furthermore, our species is equipped with a vast suite of moral and other social emotions designed to steer us towards within-group cooperation and intergroup distancing (Fischer and Manstead 2016; Greene 2014). Language is a primary channel for expressing and implementing these various ingredients of our social life, both in informal settings and in institutional ones (e.g., in court, the hospital, 911-calls, and psychotherapy). We use language to persuade others to do what's good for them (or us), and to tell others how much we care about things (e.g., how much we align with them and dislike others, or vice versa). We also use it to help or console others, to establish and enforce rules and norms, to manage impressions, and to share perspectives on the human condition. The fact that much of our talk reflects our emotion-rich sociality implies that there will be many occasions where linguistic signs and emotions

co-occur – this provides ample opportunity for emotions to influence the various processes and representations involved in language production, comprehension and acquisition (cf. argument 3). Furthermore, to the extent that biological and cultural evolution shaped the language code to not only refer but to also *express* emotional stances, one might expect additional relations between human emotion and the nature of the code. All this suggests that emotion should be richly intertwined with real-time language processing as studied in psycho- and neurolinguistics, with patterns of both informal and institutional language use as studied in, for example, sociolinguistics and discourse studies, and with the nature of the language code as studied in semantics and pragmatics. I return to this in Section 4.

3 How do emotion researchers define emotion?

Systematic inquiries about the nature of emotion go all the way back to classic Greek philosophy (Scarantino 2016), and most likely even further. Emotion, however, has turned out to be a tough nut to crack. Many different definitions and theories of emotion have been presented over the years, and although the field has converged on *some* ideas, theorists differ on many of the most fundamental issues. They sometimes even debate whether *emotion* is a useful scientific concept at all. Also, each of the many different theories take position on a multitude of issues (e.g., is emotion a natural kind, are there basic, culturally independent emotions, does every emotion have its own dedicated neural circuitry, is emotion equivalent to feeling, do emotions cause or merely explain behavior, do emotions have fully automatic consequences).

Emotion scientists aiming for a comprehensive review sometimes “flatten” this high-dimensional theoretical space along a particularly salient dimension, and systematically organize their discussion by means of that dimension (see, e.g., Gross and Barrett 2011: figure 1; or Scarantino 2016: figure 1.1). Given the aims and intended audience of this chapter, however, I take a different approach. First, I will outline the perspective on emotion adopted in each of four different influential positions in that theoretical space: the basic emotion perspective, the motivational perspective, the component process perspective, and the psychological construction perspective. Next, I will discuss what these various theoretical positions have in common (the unproblematic core of emotion science), as well as which issues are currently debated. This discussion will be organized around a simple, graphically expressed working model of an emotion episode (adapted from van Berkum 2018: figure 28.1), a model that I will use to convey both what is generally agreed upon and what is still contested. The reason for this unusual approach is that I suspect most language researchers will probably want to come away not only with an understanding of the theoretical positions, but also with a few relatively unproblematic working assumptions that they can use in their own research, coupled with some insight into the more unstable part of emotion science.

Everyday usage of the term *emotion* restricts it to short-lived, intense, consciously experienced responses to particular stimuli. Prototypical examples are fear in response to finding a huge snake on our path, anger in response to being insulted, and happiness when being offered the job we really wanted. However, the range of emotion-related phenomena

is much wider than such brief intense emotion episodes. It also includes the less intense, possibly even unconscious emotion episodes that affect much of our behavior (stimulus-induced evaluations and preferences), the more slowly fluctuating background mood we are in, our stable attitudes, sentiments and preferences, our emotional styles and traits, and the unfortunate emotional disorders that may strike us (e.g., Scherer 2005). Theorists differ with respect to how they see the relations between these different types of phenomena (see Fox et al. 2018: question 2), and with respect to whether they focus on one or more of them. Also, depending on context, terms such as *emotion* or *affect* can be used to refer to specific types of phenomena (e.g., only a particular class of short-lived responses), but also to the much wider superset of *all* emotional phenomena (as in *emotion research*, or *affective neuroscience*).

3.1 Dominant theoretical perspectives on emotion

3.1.1 The basic emotion perspective

The basic emotion perspective is organized around two central ideas. First, that the short-term intense emotion episodes that characterize human life reflect discrete emotion types. Second, that at least some of these emotion types are biological adaptations. The discreteness idea is close to how we approach emotions in everyday life: we take fear, anger, joy, shame and pride to be qualitatively different beasts, fundamentally different coherent states of being that are systematically brought about by different things and have systematically different effects. What makes basic emotions theory unique is that it proposes that the discreteness of basic emotions reflects the fact that biological evolution endowed us with a set of discretely different underlying systems (*affect programs, survival circuits, emotion action systems*).

Inspired by Darwin's observations on the expression of emotion across species (Darwin 1872), and by his own cross-cultural research on the nonverbal expression of emotions in Papua New Guinea (Ekman 1972), Paul Ekman formulated one of the most influential versions of this perspective (e.g., Ekman 1972, 2003, 2018; Ekman and Cordaro 2011). On Ekman's account, basic emotions are species-general unique responses that evolved to deal with "fundamental life tasks – human predicaments such as losses, frustrations, successes and joys" (Ekman and Cordaro 2011: 365). Anger, for example, evolved to deal with "interference with our pursuit of a goal we care about", fear evolved to deal with "the threat of harm, physical or psychological", and surprise evolved to deal with "a sudden unexpected event" (Ekman and Cordaro 2011: 365).

For something to qualify as a basic emotion in this account, it should have the following 13 characteristics (Ekman and Cordaro 2011: 365): (1) a distinctive universal signal, such as the unique facial expression of fear; (2) a distinctive physiological response pattern, such as the typical combination of changes in heart rate, blood flow distribution, breathing, sweating, and gastro-intestinal activation associated with fear; (3) generated via automatic appraisal, i.e. the trigger for fear is automatically recognized as such; (4) distinctive universals in antecedent events, with for example "threat of harm" being the unique ca-

nonical trigger of fear; (5) presence in other primates, for example, chimps should also have fear; (6) potentially rapid onset, for example, fear can very quickly emerge; (7) brief duration, for example, fear can dissipate quickly as well; (8) an “unbidden occurrence”, for example, fear can present itself against one’s wishes; (9) distinctive thoughts, memories and images, such as, for fear, thinking about escape; (10) a distinctive subjective experience, such as the “feel” of fear; (11) once initiated, a refractory period during which information from outside or from memory is filtered to what supports the emotion, such as, with fear, a focus on the threat; (12) an unconstrained target, meaning that, for example, *anything* can elicit fear as long as it can be classified as posing a “threat of harm”; and (13) usable in either a constructive or destructive fashion, so that, for example, particular instances of fear can be very helpful in your life and that of others, but other instances might be very detrimental to it. According to Ekman and Cordaro (2011), the list of what counts as a basic emotion in this sense is still under construction, but contains at least happiness, sadness, surprise, anger, fear, disgust, and contempt. Promising candidates for basic emotion status are, among others, amusement, relief, excitement, wonder, ecstasy, and pride.

While Ekman’s proposal was grounded in psychological and ethnographic research, affective neuroscience research has also led to influential versions of the basic emotion perspective. Based on animal research, for example, Jaak Panksepp (1998, 2008, 2018; Panksepp and Biven 2012) has argued that *Homo Sapiens* shares several biologically evolved “affect systems” with related species: a SEEKING system (responsible for, e.g., “wanting”, interest, and simple approach behavior), a RAGE system (responsible, e.g., for anger, irritation, and aggressive behavior), a FEAR system (responsible for, e.g., fear, anxiety, and the associated avoidance behavior), a LUST system (responsible for sexual feelings and the associated behavior), a CARE system (responsible for, e.g., feelings of love and the associated nurturing behavior), a PANIC/GRIEF system (responsible for, e.g., sadness and attachment behavior), and a PLAY system (responsible for joy and playful behavior). Although not all of these affect systems straightforwardly map onto familiar folk categories of emotions, the core idea is again that humans come equipped with a set of biologically evolved affect systems, each responsible for a discrete affective state (or family of states) and an associated behavioral repertoire.

The idea that emotions are rapid and (at least initially) involuntary, “pre-packaged” responses to central problems of life, generated by dedicated systems that evolved for that purpose, is widespread in emotion science, and can also be found in, among others, Adolphs (2017, 2018), Damasio (2010; Damasio and Damasio 2018), Izard (1993), Lang and Bradley (2018), LeDoux (1996), Levenson (1994), Tomkins (1962), and Tooby and Cosmides (2008). In the basic emotion perspective, emotions are mandatory, as well as relatively inflexible in the cascade of responses they entail. In the words of Ekman and Cordaro:

When we are in the grip of an emotion, a cascade of changes (without our choice or immediate awareness) occurs in split seconds in: the emotional signals in the face and voice; preset actions; learned actions; the autonomic nervous system activity that regulates our body; the regulatory patterns that continuously modify our behavior; the retrieval of relevant memories and expectations; and how we interpret what is happening within us and in the world. These changes are involuntary; we don’t choose them. (Ekman and Cordaro 2001: 366)

This sounds much like a reflex. However, basic emotion theorists usually see emotions as a bit more intelligent and somewhat more flexible than simple reflexes. Ekman (Ekman

and Cordaro 2011), for example, allows for a limited degree of learning on the output side (usually not so much to overrule built-in behavioral patterns, but to extend the repertoire with new reflex-like habits), as well as a limited degree of inhibitory control over the actual output (e.g., inhibiting one's expression to honor cultural display rules). Also, basic emotions are fundamentally open-ended on their input side, in that, unlike, say, the knee-jerk reflex, associative learning can extend their triggers beyond the evolutionarily intended range. The basic emotion perspective should therefore be seen to explicitly position emotion between rigid reflexes and highly flexible deliberate cognition: "emotion states evolved in order to allow us to cope with environmental challenges in a way that is more flexible, predictive and context-sensitive than are reflexes, but that doesn't yet require the full flexibility of volitional, planned behavior" (Adolphs 2017: 25).

The basic emotion perspective is an intuitively attractive position, but it has been challenged on several grounds (see Scarantino [2015] for discussion). Three of the most influential challenges will be discussed next.

3.1.2 The motivational perspective

Basic emotion theories are strongly rooted in evolutionary thinking, and therefore usually have a strong focus on the behavioral repertoires associated with particular emotions, such as particular facial expressions and other "preset actions" (e.g., approaching something interesting, crying out in surprise, raising one's voice, or recoiling at an unexpected and rapidly approaching large object). Because emotion can be considered to motivate such behavior, basic emotion theories such as Ekman's, as well as their precursors in behaviorist theorizing (Watson, Skinner) are sometimes seen as part of a wider *motivational tradition* (Scarantino 2016). For current purposes, however, it is useful to separately discuss two theories that, while endorsing the idea that emotions are adaptive functional states that evolved to solve fundamental life tasks, much more strongly foreground *motivational states* as the heart of emotion.

Many versions of the basic emotion perspective, including Ekman's, assume that particular emotions *automatically* generate emotion-specific "reflex-like" actions. But there is a problem with such accounts: most of the actions that we consider to be emotional are much more flexible than that. This problem, which has been dubbed the problem of variability (Scarantino 2015), already becomes apparent when we say that fear is associated with flight *or* freezing (so which one is it, then?). Also, anger can cause us to yell out impulsively, say something in a menacing tone, or do nothing and decide to write a vicious e-mail later. How do we explain this variability in emotional behavior?

The key idea, first foregrounded by psychologist Nico Frijda (1986, 2007, 2008), is that we equate specific emotions not so much with specific behavior patterns, but with specific motivations. Frijda characterizes these motivations as follows:

Emotions can [...] be regarded as passions – as defined as event-instigated or object-instigated states of action readiness with control precedence. "States of action readiness" are states of readiness for actions to maintain or modify one's relationship with the world or oneself, including loss or decay of motivations to relate. [...] "Readiness" implies being set for action if and when appropriate conditions

arise, and if relevant actions are available in one's action repertoire. Some states of action readiness are diffuse and have no aim other than to relate or not to relate in general, they are called "activation states". Besides apathy, diffuse excitement and unfocused receptivity, as in some states of meditation, are examples. Other states of action readiness have the aim of achieving, maintaining, or modifying one's relationship to a particular object or event in a particular way – by seeking proximity, by moving away or protecting oneself, or by moving against and blocking interference. These are called "action tendencies" and command actions that can fulfil their aim. (Frijda 2008: 72)

On Frijda's account, action tendencies come in very specific types, such as the desire to take in and experience something, to shut off stimulation or interaction, to approach, to withdraw (avoid, be out of reach, or protect oneself), to reject, to oppose, to disappear from view, to be with, to fuse with, to dominate, to submit, to possess, to care for, to make up for what has happened, to undo what has happened, to hurt, to undertake action to overcome an obstacle, and to depend (Frijda 2007: table 2.2). Actions can be overt, i.e., involve motor behavior, but they can also be cognitive, such as changes in attention, or changes in beliefs.

Frijda's theory foregrounds two other important concepts. One is *control precedence*. The states of action readiness that we associate with emotion take priority, they seize control and dominate other states in determining what happens next. It is this prioritizing that distinguishes the passionate urge to flee (a state of fear) from, say, the dispassionate belief that something (e.g., smoking) is dangerous. A second central concept foregrounded by Frijda is *concerns*, the stable psychological needs or "core values" of human beings (e.g., to succeed, obtain possessions, make friends, create, be unique, have power, educate, avoid pain, have fun, and gain approval; see Frijda 2007: table 5.1, based on Murray 1938, and table 5.2, based on Schwartz 1992). Emotions arise when some event is appraised as relevant to the individual's concerns, and the function of those emotions is to safeguard those concerns.

Frijda's ideas have recently been refined in the Motivational Theory of Emotion (MTE) proposed by philosopher Andrea Scarantino (2014, 2015). Scarantino defines emotion as "a prioritizing action control system, expressed by either (in)action tendencies with control precedence or by action reflexes, with the function of achieving a certain relational goal while correlating with a certain core relational theme" (Scarantino 2015: 178). The relational goal of an emotion is the intended abstract end result, such as an obstruction being removed in the case of anger, one's own safety in the case of fear, or an object being expelled in the case of disgust. The core relational theme of an emotion, a notion proposed by Lazarus (1982, 1991), is the canonical pattern or *formal object* that the emotion is intended to be triggered by (or "represent"), such as an offence in the case of anger, a danger in the case of fear, and a potentially noxious object or agent in the case of disgust (see Scarantino [2016] for discussion of the formal object idea).

Scarantino's MTE provides an interesting classification of overt or mental "emotional actions", allowing for true *emotional reflexes* (e.g., recoiling from a suddenly approaching large object), for *impulsive emotional actions* (e.g., slapping somebody), and for *planned emotional actions* (e.g., delivering a carefully designed insult). Relatedly, the MTE proposes that with the exception of emotional reflexes, the consequences of having an emotion are determined by how the prioritized action tendency interacts with *rational control*. Emotion theorists have a strong interest in how emotions can be regulated (see, e.g., Gross and

Barrett [2011], or the chapters in Hermans, Rimé, and Mesquita [2013]), but in basic emotion accounts, there is a tendency to view such emotion regulation as optional and “external” to an unfolding emotion episode. In the MTE, however, regulation becomes an integral part of how emotional actions arise. Regulation is needed to check on the compatibility of the current relational goal (e.g., an obstruction removed) with other goals and values (e.g., having friends, being accepted), as well as to translate that relational goal into a set of sub-goals that is instrumentally adequate for reaching it.

In an architecture such as this, the same emotion (i.e., the same state of action readiness with control precedence) can easily lead to very different, contextually customized actions. And this makes sense. In a thoughtful discussion of the “preset actions” idea postulated by basic emotion theorists such as Ekman, Scarantino observes that:

the fundamental life tasks that basic emotions allegedly evolved to solve are highly abstract and require different adaptive responses in different circumstances. Consider the task of reaching safety from dangers. Dangers differ in terms of how serious they are, in terms of how distant they are, and in terms of what is required to avoid them. Some dangers are relatively negligible and quite distant (e.g., entering an area in which a predator attack has occurred in the past), and they demand nothing more than orienting and getting ready for unspecified actions if the danger increases. Some dangers are significant and imminent (e.g., being hit on the head by a large falling object), and they demand specific and reflex-like actions (e.g., instantaneously jumping away from the object’s trajectory). Some dangers are also significant and fairly imminent (e.g., being attacked by a wolf running towards us from a short distance), and they can be dealt with successfully by a nonspecific range of actions that require some degree of planning and bodily control (e.g., finding a tree and climbing it, getting a long stick hidden behind a bush and keeping the wolf at bay with it, reaching for an arrow and shooting the wolf with it). In other words, in order to successfully tackle the problem it evolved to solve, the affect program of fear must operate in a reflex-like fashion in limiting cases (e.g., the large falling object case), but most of the time it needs to allow for a great deal of flexibility in responding. If it did not, its evolutionary selection would be utterly implausible in the presence of widely diverse embodiments of the same life task. (Scarantino 2017b: 330)

Related to the same behavioral flexibility issue, Scarantino (2017b) has also compellingly argued that emotion scientists should move away from thinking about causation as constant conjunction (e.g., fear *always* leads to physiological, cognitive and behavioral consequences X, Y and Z), and towards more realistic ideas of causation as probabilistic (e.g., fear *increases the probability* of physiological, cognitive and behavioral consequences X, Y and Z).

Compared to Basic Emotion Theories such as Ekman’s, motivational accounts such as Frijda’s, and Scarantino’s MTE are much more articulate in acknowledging and accounting for the “output flexibility” of emotions. Building on earlier insights about how particular events trigger particular emotional states (e.g., Arnold 1960), both theorists have also carefully considered the “input side” of things, i.e., the nature of appraisal. However, the most articulate analysis of appraisal to date can be found in a third influential perspective on emotion: the component process perspective.

3.1.3 The component process perspective

Just like the preceding two perspectives, The Component Process Model (CPM) proposed by psychologist Klaus Scherer and colleagues (e.g., Scherer 1984, 2005, 2009a; Sander,

Grandjean, and Scherer 2005; Scherer and Moors 2019) defines emotions as unique functional states whose triggering conditions and effects are not coincidental, but the result of biological adaptation. However, it abandons the idea that the functional state of each particular emotion is controlled by a dedicated affective system (*affect program, survival circuit, action control system*) specific to that emotion. Related to this, the CPM is much more precise in specifying the nature of those triggering conditions, and the information processing involved in appraising something as worthy of emotion. It is for this reason that the CPM is also classified as a core example of so-called *appraisal theories* (together with, e.g., theories by Arnold [1960] and Lazarus [1992]), and, more generally, as being part of the *evaluative tradition* in emotion science (Scarantino 2016).

Scherer has defined emotion as “an episode of interrelated, synchronized changes in the states of all or most of the five organismic subsystems in response to the evaluation of an external or internal stimulus event as relevant to major concerns of the organism” (Scherer 2005: 697). Those organismic subsystems, which include cognitive appraisal processes, autonomic physiology (e.g., changes in the degree or patterning of sympathetic arousal), action tendencies (e.g., a strong urge to fight or flight), motor expression (e.g., facial), and subjective feelings, are part of why the theory classifies as a componential one (Scherer 2009b). However, the Component Process Model is componential in a much more interesting and innovative sense: particular changes in one’s autonomic physiology, one’s current action tendencies, one’s motor expression, and one’s subjective feelings are directly driven by particular ingredients of the appraisal process (Stimulus Evaluation Checks, SECs), in a way that make “local” sense and is not coordinated via some master plan.

An overview of major SECs proposed by the CPM is provided by Scherer (2009a). Stimulus events are appraised on relevance (How novel, i.e., sudden, unfamiliar and unpredictable is the event? Does it have consequences for my needs or goals? Is it intrinsically pleasant or unpleasant, independent of my current motivational states?), on their implications (Is it motivationally congruent or incongruent, i.e., conducive or obstructive to my needs or goals? How likely is it that the consequences will occur? How urgently do I need to react?), on the relevant coping potential (Is it caused by a human agent, and if so, why? Can it be controlled? Do *I* have sufficient power to do so? If not, how well can I adjust to the consequences?), and on normative significance (Does the event or my initial response to it correspond to internal standards? Does it correspond to more general social norms?). Although such appraisal is complex, it does not necessarily require deliberate processing. All SECs can also be processed at a level at which the checking mechanisms “are mostly genetically determined and the criteria consist of appropriate templates for pattern matching” (Scherer 2009a: 1314) (e.g., the evolved preparedness for responding to snakes or babies), as well as at a level that makes use of automatic, unconscious processes afforded by learning (as in a conditioned fear response; see Scherer 2009a: 1314).

According to the CPM, different emotions emerge as a consequence of different appraisal patterns. So, for example, whereas stimulus events that are appraised as relevant, unpleasant and obstructive might elicit anger or fear, those that are appraised as far beyond one’s coping ability are more likely to elicit fear, whereas those that are appraised as within the range of one’s coping ability, caused by a human agent, and unfair will more likely elicit anger (see, e.g., Scherer [1997] for cross-cultural evidence). Furthermore, and impor-

tantly, there is no general *affect program* (Ekman), *action tendency* (Frijda) or *action control system* (Scarantino) that orchestrates the response patterns for fear or anger. For example, the facial expression of anger is assumed to be a composite, with, e.g., the novelty of a stimulus causing a widening of the eyes, its unpleasantness causing the corners of the mouth to turn down, and the sense of control causing a tightening of the lips. Compatible with this idea, EMG studies of facial muscle activity have revealed that, e.g., appraisals of novelty correlate with activation of the *frontalis*, the “eyebrow raiser”, and that appraisals of unpleasantness correlate with activation of the *corrugator supercilii* or “frowning muscle” (see Mortillaro, Meuleman, and Scherer [2012] and Scherer and Moors [2019] for a review). The same component idea is postulated for patterns of physiological effects (with different ingredients of the appraisal controlling different physiological parameters). In all, the synchronization mentioned in Scherer’s (2005) emotion definition is not orchestrated but emerges *dynamically*, as multiple SECs generate their “own” bundles of motivational, physiological, motor, and experiential consequences in response to a single stimulus event.

A final interesting aspect of the Component Process Model is that it explicitly allows for language to impact emotion (see Scherer 2015; Scherer and Moors 2019). That is, as we become conscious of an unfolding emotion episode, we can use words or expressions to characterize and as such also classify the experience. In the CPM, such an act of categorization is optional, because emotion episodes need not enter into consciousness (i.e., may not generate “feeling”), and because even if they do, people may not choose to (or for that matter, be able to) verbalize them (Scherer 2009a). As will be seen in Section 3.1.4, however, some emotion theorists argue that this conceptual categorization is not just optional, but actually *defines* emotion.

3.1.4 The psychological construction perspective

All of the theories discussed so far assume that specific emotions like fear, anger and joy (or, in the CPM, the components thereof), are “out there” as specific natural kinds, unique classes of items that exist in nature independent of our acknowledgement of them, such as “water”, or “tigers” (Scarantino 2012). The core of the psychological construction perspective, however, is that fear, anger and joy are not natural kinds shaped by biological evolution. Instead, they are *psychological constructions*, the result of acts of categorization created by people to make sense of their current states, under the guidance of culturally shaped folk concepts. These folk concepts are useful in everyday life, but they are, on this perspective, not suitable as starting points for scientific investigation. James Russell, one of the leading psychological constructionists, has argued that folk concepts such as “fear”, “joy” or “emotion”, are “best elevated to chapter titles with no serious scientific job to do and replaced by narrower, better defined concepts” (Russell 2017: 112). Consider the folk concept of “memory”, which scientists have also replaced by more precise concepts that are more likely to delineate natural kinds, such as sensory memory, short-term memory, and episodic memory (Russell 2009).

As for emotions, what more precise concepts might those be? Russell (2017) suggests that specific emotions reflect particular constellations of (1) Core Affect (CA), “the neuro-

physiological state that gives rise to the most primitive affective feelings: feeling good, feeling bad, feeling energized, feeling enervated” (Russell 2017: 112); (2) a Perception of Affective Quality (PAQ), “a cold judgment as to how an event or object can influence core affect [which is] part of evaluations, attitudes, liking, and disliking” (Russell 2017: 112); and (3) an Emotional Meta-Experience (EME), “one’s perception of one’s own emotional state achieved by categorizing that state” (Russell 2017: 112).

Available categories are those labeled, in English, happiness, sadness, fear, anger, and so on. To have an EME of fear is to perceive one’s current state as resembling the script for fear. Resemblance is a matter of degree, and the components of the script are neither necessary nor sufficient. Indeed, actual danger is not a necessary component for fear, as in the feeling during a horror film. (Russell 2017: 112)

In her Theory of Constructed Emotion (or, formerly, Conceptual Act Theory), psychologist Lisa Feldman Barrett (2006, 2014, 2017a, 2017b, 2018) has taken a comparable perspective:

The brain continually constructs concepts and creates categories to identify what the sensory inputs are, infers a causal explanation for what caused them, and drives action plans for what to do about them. When the internal model creates an emotion concept, the eventual categorization results in an instance of emotion. [...] I’m not saying that emotions are illusions. I am saying that emotion categories don’t have distinct, neural essences. Emotion categories are as real as any other conceptual categories that require a human perceiver for existence, such as “money” (i.e. the various objects that have served as currency throughout human history share no physical similarities). (Barrett 2017b: 13)

As to what emotions are psychological constructions *of*, both Russell and Barrett assign center stage to so-called *core affect*. They define core affect as “a neurophysiological state consciously accessible as a simple primitive nonreflective feeling most evident in mood and emotion, but always available to consciousness”, which, “although one feeling [...], can be characterized by two pan-cultural bipolar dimensions: pleasure-displeasure (valence, feeling good versus bad) and activation (arousal, feeling energetic versus enervated)” (Russell and Barrett 2009: 104). The roots of core affect can be found in interoception, “the sense of the physiological condition of the entire body” critically mediated by the anterior insula (Craig 2009, 2016). It is this state that the act of categorization is intended to make sense of.

Because of their focus on emotions as acts of conceptualization, researchers who explore emotions from this perspective are extremely interested in language. In particular, they have been looking for evidence that variations in language processing or the culturally afforded emotional lexicon critically shape emotion experience and emotion perception (see Lindquist, Gendron, and Sadpote [2016] for a review). The idea here is not just that feelings can be put into words, but that “words are actually put into feelings”:

The word “anger” is thought to be in part constitutive of an angry feeling because it supports the category knowledge that is brought online to make meaning of a rapidly beating heart, high blood pressure, and unpleasantness when a person’s trust is violated, or to make meaning of a calmly beating heart, decreased blood pressure, and pleasantness when a person enacts revenge. This does not mean that a person needs to speak the word “anger”, or even think it when making meaning of an affective state. Instead, the idea is that anger groups a population of instances in a person’s conceptual knowledge (involving representations of sensations from the body, behaviors, and the context) that are all

conceived of as members of the same category despite what otherwise might be large differences among them. (Lindquist et al. 2016: 581)

Psychological construction theories share an important idea with *social* constructionist views on emotion (see, e.g., Mesquita, De Leersnyder, and Boiger [2016] for an overview, and Scarantino [2016] for a brief historically oriented discussion), which is that emotions are inherently culturally dependent. However, while research in the psychological construction tradition uses experimental-psychological and neuroscientific methods to study emotion as it is constructed by the brain and mind of an individual, the social construction tradition uses sociological, ethnographic and philosophical methods to explore the construction and function of particular emotions in interpersonal exchanges and society at large (see Hepburn and Potter [2012] for a conversation-analytic example). Although such work is clearly relevant to sociolinguistic and conversation-analytic explorations of language use, it is beyond the current (processing-oriented) scope of this review.

3.2 Shared ideas and debated ones

In Section 3.1, I have outlined four currently influential major “attractors” in the high-dimensional theoretical space of emotion science. Their current influence testifies to the fact that the field has not converged on a single stable conceptualization of emotion. Each of these perspectives has been around for some time, generated fruitful research, and received its own share of empirical support as well as criticism. Language researchers who consider involving emotion in their work are therefore left with three options: (1) wait until the field has converged; (2) pick out a particular perspective or theory on rational or intuitive grounds (e.g., because the theory’s focus and core assumptions about emotion, mind and brain fit one’s particular research questions or one’s own general assumptions about mind and brain); or (3) work with a simplified “metamodel” that captures generally shared ideas in emotion science.

Option 1 is simple, but not very attractive – it could be a long wait. The viability of option 2 depends on one’s particular questions about the language-emotion interface, but as a research strategy this selective approach can be very fruitful. Option 3, although inevitably less precise (and probably never theoretically unbiased), is more generic and “portable”. In the remainder of this section, I will facilitate the use of option 3 by capturing the important shared ideas about affective phenomena in emotion science in a metamodel, and by also using the result to highlight various issues that are currently debated in that field.

3.2.1 Shared ideas

The starting point is a working model of an emotion episode (i.e., a short-lived, “phasic” affective response, such as a brief state of fear, joy, shame, or pride) constructed for language researchers some time ago (van Berkum 2018). Figure 1.1 displays a slightly generalized version of that model, complemented with a minimal model of ongoing, continuous core affect.

Figure 1.1 depicts a set of relatively uncontentious ideas about the nature of a short-lived emotion episode, which can be summarized in nine points.

1. Elicited by a stimulus. An emotion episode starts with an eliciting stimulus, such as an event, situation, agent, object, intention, or action. The stimulus can be perceived, inferred, remembered, imagined, or even enacted (e.g., one’s own behavior), and is somehow emotionally relevant for the person at hand.

2. Concern-driven appraisal. What makes that stimulus an emotionally relevant stimulus, i.e., a trigger for short-lived emotion, is that it is in some way appraised as relevant to one’s concerns, the set of dispositional core values coded in our human biology (e.g., the desire to stay healthy, have autonomy, and be connected to others), or acquired through culturally shared and other, more unique, experiences.

3. Dealing with the stimulus. The appraisal triggers a particular “bundle” of responses, a way of dealing with this type of stimulus that has on average proved to be adaptive in one’s evolutionary past, or that has been shaped by learning. If the same stimulus relates to more than one concern, it can elicit more than one response bundle (i.e., mixed emotions).

4. Prioritized, synchronized, and rapidly emerging responses. The typical response bundle consists of fast synchronized responses along four dimensions: (a) a strong motivation or “urge” to do something and do it *now*; (b) supportive, preparative changes in the physiological state of the body, such as the release of adrenaline, changes in heart rate, and a redistribution of blood flow; and (c) cognitive responses, such as changes in attentional focus, in how things are encoded in memory, or in thinking style and/or contents; and (d) behavioral responses, such as frowning, caressing, saying something, or walking away.

5. Not necessarily conscious. Appraisals and emotional responses do not necessarily emerge in awareness. But to the extent that they do, they give rise to feeling, i.e., a characteristic type of subjective experience. The idea of unconscious emotion is somewhat counterintuitive because “emotion” is in everyday life usually equated with “conscious feeling”. However, as in other domains of mental life, the brain does most of the work without us being aware of the computations involved and of what they deliver (Adolphs 2017).

6. Regulation. The awareness denoted by feeling in turn allows one to exert conscious control over the unfolding process in various ways. Control can be exerted over the “input side” of the emotion episode, such as by trying to ignore the stimulus or by reappraising it. Control can also be exerted over the “output side”, such as by trying to suppress the motivational impulse, by exercising deliberate control over physiological parameters (e.g., via deliberate breathing), by suppressing or otherwise adapting a particular expression or other aspect of one’s behavior, or by verbally labeling the subjective experience. In the context of emotion, regulation is often seen in terms of inhibiting or otherwise channeling something impulsive (e.g., suppressing the emotion). However, regulation also involves the constructive shaping of one’s particular behavioral and mental responses, such that they realize the intended goal of the elicited motivational state in a flexible, context-dependent way.

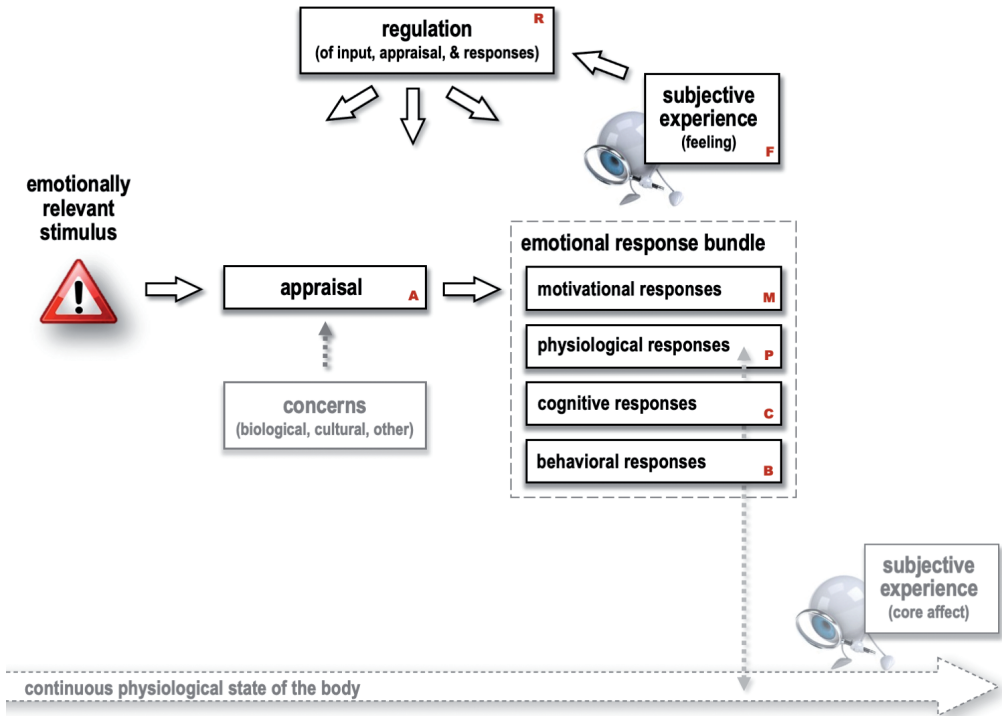


Fig. 1.1: Metamodel of an emotion episode (adapted from van Berkum 2018). In addition to delineating the canonical stimulus → appraisal → response bundle cascade and the subjective experience that goes with it, the model also expresses the relevance of concerns, as well as the possibility to exert control. The bottom part of the figure illustrates the relationship of short-lived emotion to continuous core affect (the subjective experience of the physiological state of the body). Boldface letters that accompany the various ingredients will be used to clarify specific debates in emotion science. The interfaces with language will be discussed in Section 4.

7. Learning. Just like other processes realized in neural machinery, the processes that make up an emotion episode will inevitably leave memory traces in the brain (e.g., as a result of repetition, associative emotional conditioning, or episodic memory formation). As such, they also shape the type of appraisal of and emotional response to similar stimuli encountered later. Just like the original processes, this memory-mediated later impact can occur with or without awareness (via implicit memory, or via explicitly remembering how something felt). Although emotions often lead to immediate behavioral changes, the implicit or explicit memory traces associated with an emotion episode allow much of their influence on behavior to extend well beyond the here and now (“prospective power of emotion”; Clore 2018).

8. Complex dynamic interactions. The processes that together shape an emotion episode dynamically interact with each other in many different ways. For example, apart from the various interactions afforded by feeling-induced regulation, emotion-induced physiological and behavioral responses will typically affect each other. Also, emotion-induced cognitive biases, such as increased attention, will often influence ongoing appraisal. And the subjec-

tive feeling elicited by an emotionally relevant stimulus can itself become a stimulus for emotion, setting off an additional emotion cascade of its own (Scherer and Moors 2019).

9. Occurs against the background of longer-lasting core affect. Short-lived emotion also interacts with the ongoing process of representing and regulating the physiological state of all tissues and organs of the body, including viscera, muscle, bone and skin (Craig 2016). Much of this interoceptive representation and homeostatic regulation operates outside of our awareness, but part of it emerges into consciousness and is experienced as a slow-changing state of core affect with a particular “feel” (e.g., good or bad, energized or depleted), and is at the heart of what people usually call *mood*. The cascade of events associated with short-lived emotion occurs against the background of such slower-changing core affect, and can interact with it via the physiological changes that are part of the emotion’s response bundle.

3.2.2 Debated ideas

The metamodel depicted in Figure 1.1 captures shared ideas in emotion science, but it can also be used to highlight various important debates in the field, as well as important differences in focus between different theoretical perspectives. I briefly discuss some of this below, making use of the boldface letter indices in Figure 1.1 whenever appropriate (and of angular brackets to combine components of the emotional response bundle).

One of the fundamental current debates is what the extension of the term “emotion” should be. In defining emotion as psychological construction, both Russell and Barrett (as well as Ledoux 2017) seem to equate “emotion” with a particular type of *subjective experience*, i.e., the feeling part **F** of an emotion episode. Theorists in the other three approaches discussed in Section 3.1 often allow “emotion” to have a wider scope, covering the appraisal **A**, the response bundle [**MPCB**], and the subjective experience **F**. For Scherer, for example, emotion refers to the dynamic recurrent process of how components of appraisal **A** lead to components of the response bundle [**MPCB**], to subjective experience **F**, and to regulation **R** (with these various subprocesses dynamically synchronizing and feeding back into each other as an emotion episode unfolds). However, basic emotion, motivation, and component process theorists do differ on what they see as the most interesting part of emotion. With their strong roots in evolutionary theory and the associated focus on adaptive behavior (and animal research), basic emotion theorists tend to focus on the response bundle [**MPCB**], at the expense of subjective experience **F**. Motivational theorists such as Frijda and Scarantino see the prioritized *motivational response* **M** as the heart of emotion. The focus in Scherer’s theory is clearly on *appraisal* **A**, and on how particular ingredients of that appraisal explain subsequent events. Finally, it has also been proposed that “emotion” refers to *none* of the components depicted in Figure 1.1 and is just the functional state that mediates between antecedent **A** and consequents [**MPCB**] (Adolphs 2017, 2018). Thus, although everybody agrees that the components depicted in Figure 1.1 are relevant to understanding emotion, opinions vary as to what the term “emotion” should refer to.

A related fundamental debate is whether emotion scientists should continue to use specific emotion concepts, such as “fear”, “joy”, “disgust”, or “pride” in their research,

and if so, in what way. Intuitively, it seems hard to escape doing so, in part because these terms somehow delineate the phenomena to be explained. Many emotion scientists therefore happily speak about, say, the fear system. For psychological constructionists, however, “fear”, “joy”, “disgust”, or “pride” are just culturally shaped folk concepts that tell us something about the structure of subjective experience F , and as such unsuitable starting points for a scientific investigation of the neural and bodily systems giving rise to that experience (those responsible for A , $[MPCB]$, and core affect). Joseph LeDoux (2017) has recently also argued that emotion scientists should reserve these folk concepts for describing subjective psychological states (so $F_1, F_2, \dots F_N$) only. Some theorists (e.g., Scarantino 2012) take a more moderate perspective, arguing that it is useful to start from folk concepts (e.g., “disgust”), as long as one is prepared to split the emotion up into more specific categories, should the mechanisms uncovered dictate it (e.g., “physical disgust” vs. “moral disgust”).

This is of course intimately related to the debate over whether people come equipped with evolutionarily predetermined discrete emotion systems $E_1, E_2, \dots E_N$ (basic emotions) or not, and, if so, what the nature of those systems is. In the basic emotion view, our biology predisposes us to make certain categorical appraisals $A_1, A_2, \dots A_N$ (e.g., “the threat of harm”, “interference with pursuing a goal we care about”, “a sudden unexpected event”), and to pair those appraisals with specific preset response bundles $[MPCB]_1, [MPCB]_2, \dots [MPCB]_N$ (e.g., fear, anger, and surprise, respectively). Motivational theories such as Frijda’s and Scarantino’s agree with this one-mapping-per-emotion idea but propose that it holds for relations between appraisals $A_1, A_2, \dots A_N$ and *motivations* (states of action readiness) $M_1, M_2, \dots M_N$, not entire $[MPCB]$ response bundles. In Scherer’s model, however, the mapping between appraisal and response, although largely biologically predetermined, sits at the level of *components* of emotions (e.g., novelty \rightarrow widening of eyes, as an independent component of the expression of fear, or of surprise). This naturally allows for a much more continuous multidimensional emotion landscape, with clusters corresponding to familiar emotions as well as less clearly categorizable cases, but no discrete categories. As such, the component process approach is actually in line with the idea that emotion scientists should be prepared to abandon the folk categories that people use in everyday life. Psychological constructionists, finally, propose that the only aspect of emotion that is biologically predetermined is core affect, a continuous low-dimensional affect space that can be characterized in terms of valence and arousal.

There are at least three further debates in emotion science that can be considered as spin-off from the previous one. One is whether emotions such as “fear”, “joy”, “disgust”, or “pride” have their own specific and culturally invariant neural and physiological signature (i.e., $E_1, E_2, \dots E_N$ invariantly map onto $P_1, P_2, \dots P_N$). The second is whether these emotions have their own specific and culturally invariant facial, vocal and postural expressions (i.e., $E_1, E_2, \dots E_N$ invariantly map onto $B_1, B_2, \dots B_N$). The third one is whether the various components of a response bundle $[MPCB]$ cohere enough internally, within each particular response bundle, to define those bundles as the products of coordinating affect programs (so $[MPCB]_1, [MPCB]_2, \dots [MPCB]_N$), instead of as ad hoc clusters that “accidentally” emerge because of the structure of the world.

Another debate concerns the status of subjective experience, i.e., feeling. Many theorists have argued that as an emotion unfolds, the $A \rightarrow [MPCB]$ cascade is initially uncon-

scious and can in principle remain entirely so – subjective experience **F** only emerges when appraisals and/or responses are intense or salient enough to lead to a conscious state. Because according to this view, **F** is basically a “readout” of states and events in the **A** → **[MPCB]** cascade, this is sometimes referred to as the readout view of feeling. For other theorists, however, feeling is a necessary ingredient of emotion. This idea follows naturally from the psychological construction perspective, where subjective experience **F** is the heart of emotion. But the idea is also subscribed to by basic emotion theorists that foreground a primitive form of pleasant or unpleasant feeling at the heart of emotion (e.g., Panksepp and Biven 2012), not as a readout, but as part of the response bundle itself (so, **A** → **[FMPCB]**).

A final relevant debate involves the extent to which regulation **R** is opposed to, part of, or even identical to emotion. Basic emotions theorists tend to view the response bundles **[MPCB]** for individual emotions as relatively reflex-like, automatic consequences, which leads to a perspective on control that is usually opposing, i.e., “inhibitory”, or at least “channeling”. In psychological construction theories, on the other hand, some of the cognitive processes involved in regulation **R**, such as reappraisal, are not fundamentally different from those involved in conceptualizing the subjective experience **F**, i.e., “the emotion”, in the first place (see Gross and Barrett 2011). The motivational theory of Scarantino, finally, offers a richer view on regulation **R** than either of these other perspectives: here, regulation **R** is not just about “inhibition” or “reconceptualization”, but also about allowing deliberate control to combine with the motivational impulse **M** such that the other components of the response bundle – **[PCB]** – can become much more flexible and context-dependent.

There are many more debates in the emotion field, for which I refer the reader to Barrett, Lewis, and Haviland-Jones (2016), Fox et al. (2018), and Sander and Scherer (2009). For present purposes, it is more useful to say a few things about where the field might be heading, and then return to language research.

3.2.3 How will the emotion field develop?

Although predicting developments in such a large and complicated field is difficult, I believe the following developments to be most likely:

1. First, the lack of evidence for unique and invariant neural, physiological, and expressive signatures of specific emotions (such as a single characteristic brain state, physiological state, and expression for anger, across cultures and situations; see, e.g., Barrett 2017a, 2017b; Barrett et al. 2019; Scarantino 2015, 2017b) will be an increasing embarrassment for classic versions of the basic emotion perspective. This will create a push towards the motivational reincarnations of such theories. Motivational theories do not require such reliable signatures to the same extent, but do retain the core idea that nature has endowed us and many other animal species with various specific emotions to handle recurrent problems in life.
2. Second, it seems reasonable to expect attempts at merging the central tenet from motivational theory with the componential approach of CPM. After all, what nature endowed us

with may have evolved both at the level of specific emotions (e.g., all mammals evolved anger as a motivational solution to a recurrent problem in social life) *and* at the level of various components (e.g., all mammals evolved specific responses to goal obstruction, to having a sense of control, etc.).

3. Third, it seems likely that emotion research will increasingly embrace a valuable insight afforded by the psychological (and social) constructionist program: like other forms of experience and perception, the *experience* of emotion in ourselves and the *perception* of emotion in others is partly constructed. As such, feelings and perceptions of emotion can be strongly influenced by cultural conventions, including the stories we tell about emotions and the words that our language has to tell them with.

4. Fourth, and related, I think there will be increasing acceptance of the idea that the categories of emotion that are distinguished in ordinary life to explain our own and other people's behavior (e.g., "fear", "love") are not necessarily the best categories to ground emotion science in. For sure, they are inescapable starting points for a science of *feeling*. However, for other aspects of emotion, progress may well call for finer distinctions (LeDoux 2017; Scarantino 2012), and perhaps even the abandonment of some folk categories altogether. This is compatible with a motivational as well as a component process perspective, but the componential approach does have a head start in such reconceptualization (e.g., Scherer and Moors 2019).

5. Finally, I expect increasing leverage for the idea that emotions need not all have the same fundamental architecture (Scarantino 2012): whereas some human emotions might be best described from a motivational perspective, others might be better described from a basic emotion, component process, or psychological construction perspective. Although the principle of parsimony supports the quest for a single unifying perspective, the multi-perspective idea is a liberating one, and one that may turn out to have more explanatory power in the end.

4 A research agenda for affective language science

The metamodel of an emotion episode that I developed in Section 3 does not only help us think about various debates in emotion science, but can also provide a framework for thinking about the interfaces with language. By way of illustration, Figure 1.2 lists several interesting questions about those interfaces.

As evidenced by the other chapters in this handbook, many of these questions are already being pursued, and Figure 1.2 merely uses the metamodel to systematically organize them relative to each other. However, the metamodel can also alert us to important understudied questions. For example, a question that addresses a primary interface between emotion processing and language processing – how emotions shape verbal utterances during language production – has not yet received the amount of attention it should have, neither in emotion science, nor in language science (van Berkum 2020).

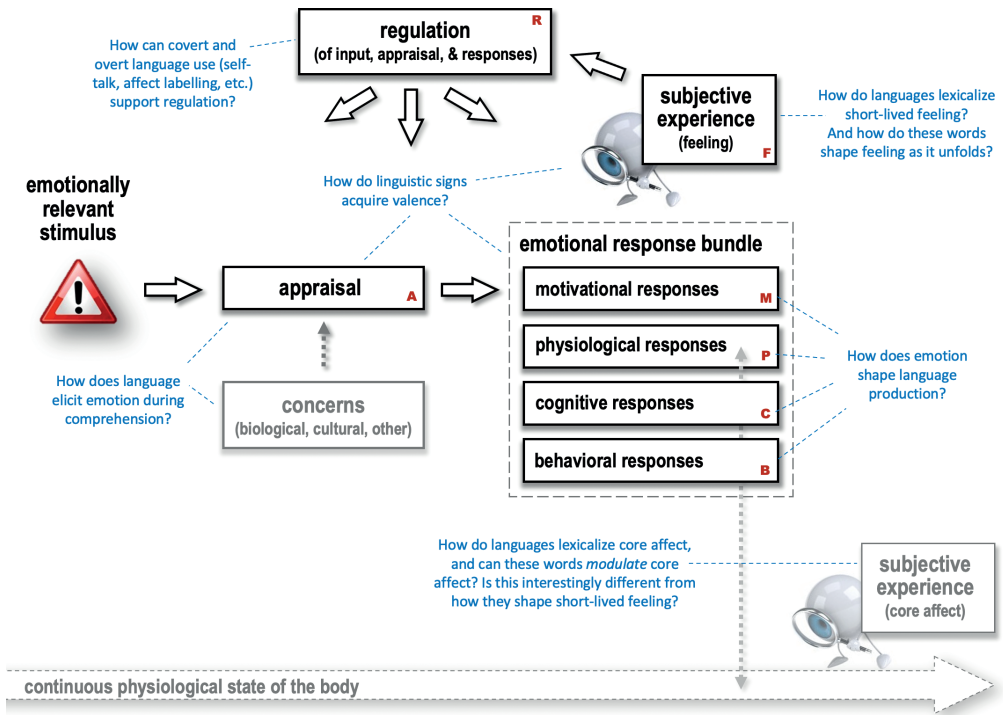


Fig. 1.2: Some questions about language-emotion interfacing, next to the metamodel component that they are most closely aligned with.

Although useful in providing a context for old or new questions, the metamodel in Figure 1.2 is inevitably somewhat biased to the timescale of real-time language processing, at the expense of questions that involve a slower timescale. Also, while the metamodel zooms in on emotion processes within a single individual, verbal communication always involves two or more individuals, and communicators usually design their utterances while taking into account the *addressee's* (or *overhearer's*) emotion as well (Crivelli and Fridlund 2018; Hess and Hareli 2019). The agenda for research on the language-emotion interface therefore extends well beyond the few examples provided in Figure 1.2.

Outstanding questions about the language-emotion interface can be grouped by time scale (real-time processing, acquisition, language change/evolution) and by whether they tend to primarily focus on language (1–3) or on emotion (4):

1. Questions about the role of emotion in real-time language processing. At the language comprehension side, we need to explore how linguistic and paralinguistic stimuli trigger emotion during comprehension (see, e.g., van Berkum [2018, 2019] for an explicit model), and how the addressee's earlier emotional state enters the equation. As emotions are embodied, we also need to sort out which aspects of language-driven emotion can be profitably seen as “embodied language processing” (i.e., simulation), and which aspects are better viewed in other terms (see, e.g., ‘t Hart et al. 2018, 2019, 2021). Furthermore, language can affect the comprehender's emotion in several ways, and it is important to

understand which of these “perlocutionary effects” are actually intended by the speaker, and which are side effects. And we can ask how the concepts developed in rhetoric and framing research, both central to understanding perlocutionary effects, relate to the processing architecture of emotion. At the language production side, it will be important to explore such things as how speaker (author, signer) emotion ends up being expressed in what is being said and how, and which of that is an intended “ostensive sign” as opposed to an unintended sign (cf. non-natural vs. natural meaning; Grice 1967). We also need to understand when and how speakers deliberately exploit the addressees’ emotional nature *independently* of their own emotional state (see, e.g., Scarantino 2017a). And in those cases where it seems more fruitful to see emotion as overtly enacted and/or jointly constructed, it is important to ask how interactants “perform” emotion and align or oppose their stances (see, e.g., Goodwin, Cekaite, and Goodwin 2012; Hepburn and Potter 2012; Peräkylä et al. 2015), and how those overt performances interact with private emotional states.

2. Questions about the role of emotion in language acquisition. These include important questions about the role of emotion in facilitating early language acquisition (e.g., via the effect of emotion on memory encoding; see Kensinger and Schacter 2016). Also in this category, for example, are questions about the acquisition of emotion concepts, and, more generally, about how emotional conditioning and other forms of emotional learning can contribute valence to any word or constructions (see also Figure 1.2). One particularly relevant well-known phenomenon in emotion science is that Pavlovian emotional conditioning leads to a transfer of desiring the unconditional stimulus or primary reward (e.g., a food reward) to also really desiring the cue that reliably signals it (e.g., the sign that predicts food; Berridge 2012). Such displacement of emotion from a referent to its cue can help us understand how word valence comes about (see, e.g., van Berkum [2018] for discussion).

3. Questions about the role of emotion in shaping the language code and the wider pragmatics machinery. A central question here is the extent to which language, as a code, has been evolutionarily and/or culturally shaped to accommodate the role of emotion in human social exchanges, at the level of the lexicon (emotion words, intensifiers, etc.), as well as other aspects of the grammar (see, e.g., Besnier 1990; Foolen 2015; Majid 2012; Potts 2012). Another issue of interest to explore is how signs of emotion that come for free with our biology (e.g., frowning) relate to the “non-natural” linguistic or other signs that we can use to express emotion, as well as whether natural emotional expressions may have paved the way for the types of speech acts we can perform through language (see, e.g., Scarantino 2017a).

4. Questions about the role of language in the experience and control of emotion. This final category includes many important questions about the role of self-directed language in actively shaping and regulating one’s emotional responses and experiences (cf. affect labelling, self-talk, expressive writing, or simply counting to ten). It also includes questions about how our emotion lexicon affects the perception of emotion *in others* (see Lindquist et al. [2016] for a review). Furthermore, there are questions about how people use language to achieve interpersonal rather than just intrapersonal regulation, as when regulating emotions by displaying them to others (see Fischer and Manstead 2016). Questions in this category interestingly mesh with those in category 1.

The research agenda for affective language science reveals not only how diverse that investigation actually is, but also how interesting and important the various questions are, for emotion researchers and language researchers alike. Of course, this does not mean that every language researcher should now also involve emotion in their research – after all, there are many, many interesting questions about language that do not relate to emotion at all. In fact, what makes language “special” are such things as its combinatorial nature, and its capacity to refer to real or counterfactual worlds with arbitrary signs as well as arbitrary precision, not the fact that it interfaces with emotion. Yet, it seems safe to say that every actual linguistic exchange between humans is affecting and/or is being affected by *some* conscious or unconscious emotion, and, in addition, that the perlocutionary effects of language use to a large extent depend on such emotion. Hence, just like it is important for those who study, say, semantics to be aware of some of the basics of pragmatics, syntax, and phonology, it is important for those who study language to be aware of some of the basics of human emotion.

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