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Appraisal Theory: Old and New Questions

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Abstract

I describe my current thinking on two old questions—the causal role of appraisals and the relationship of appraisal theories to basic emotions theories and constructivist theories, and three (sort of) new questions—the completeness of appraisals, the role of language, and the development of automaticity in emotional responses.

Keywords
appraisal, emotion, emotional development, role of language

Appraisal theories of emotion, like all good theories, are informed by a multiplicity of earlier perspectives. Like Darwin (1872) and James (1884), they assume that emotions are adaptive (Arnold, 1960; Ellsworth, 2007; Nesse & Ellsworth, 2009), motivating appropriate responses to environmental challenges and opportunities. Like dimensional theories, dating back to Wundt (1874/1902), they see emotional experience as continuous, with infinite variations in a multidimensional space, rather than as separate, independent categories or programs. And they see emotional experience as an ever-changing process, like a river, rather than a collection of separate pools, or like the weather, rather than like sunlamps and refrigerators. Appraisal theorists believe that thought and emotion are largely inseparable, that emotions arise from the organism's perceptions—its *appraisals*—of environmental changes that are relevant for its well being. Like constructivist theorists (Averill, 1980a; Barrett, 2006a; Schachter & Singer, 1962; and cf. Johnson-Laird & Oatley, 2000), they believe that human beings' appraisals of an event are influenced by temperament, physiology, culture, current goals, and past life experiences, so that similar events can provoke different emotions in different people, or in the same person at different times.

What is different about appraisal theories is that they don't just say that a person's emotions are constructions of the meaning of the situation and leave it at that, vague and amorphous. They specify the materials that go into this construction, the constituent elements of emotional experience. These elements are the appraisals: Novelty, valence, certainty, goal conduciveness, agency, and control are the ones most commonly proposed. To say that a person feels aroused, or aroused and negative, and the situation and her past life define the specific emotional experience, is to say next to nothing about what it is that differentiates fear, anger, grief, and disgust—what it is about the situation that *matters.* Specifying what matters in the person's perception of the situation has been a central goal of appraisal theory, and its most original contribution.

Old Questions

Do Appraisals Cause Emotions?

I am often asked whether I think that appraisals cause emotions: yes or no? My writings have been unclear on this point because my thoughts are unclear. The issue of causality in emotion is a vexing one for me, and one that I have generally tried to avoid. There is a fundamental ambiguity to the question because there are so many different definitions of "cause" and so many different definitions of "emotion." Most current theories of emotion, including appraisal theories, are multicomponential (Niedenthal, Krauth-Gruber, & Ric, 2006), with appraisal a significant component that differentiates emotions. But, as Frijda points out, an ingredient, no matter how essential to the emotional experience, is not the same thing as a cause (Frijda, 1993; Frijda & Zeelenberg, 2001). He also argues convincingly that what counts as a cause depends on one's definition of emotion. If emotions are defined as categorically distinct states, the definition of cause is quite different than if emotion is defined as an ever-changing multidimensional process. In the latter case, because in any emotional state certain appraisals are more salient and available than others, appraisals can cause emotions,

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and emotions can also cause future appraisals (Keltner, Ellsworth, & Edwards, 1993; Lerner & Keltner, 2000). The fact that something is an ingredient does not *rule out* its being a cause. Water, for example, can be the cause of a seed becoming a plant, but water is also an essential component of the plant.

Like most appraisal theorists, I believe that emotional experiences usually, but not always, start with appraisal. This assumption sounds as though appraisals *precede* emotions, and therefore are in a position to cause them, but that is not what I think. I think that appraisal changes involve neural and physiological changes and thus an appraisal change *is* an emotional change. The first appraisal leading to an emotion or a change in emotion is usually the perception of novelty. A person may be walking from here to there, with the mind in a sort of emotional "default mode" (Raichle & Snyder, 2007), daydreaming and drifting among internally generated thoughts and images, and then something changes and the person notices. The unfocused background state is replaced by focused attention. Sometimes the novel stimulus is easily explained and dismissed as irrelevant, in which case the development of emotion is aborted; otherwise an emotional experience begins.

The appraisal of novelty is associated with physiological changes, such as lowered heart rate; expressive and other motor changes, such as widened eyes or a turn of the head, if it is an external stimulus, or slight tension of the corrugator muscle (a frown), if it is a novel thought or memory; changes in action tendency, so that ongoing action is suspended and the person is motivated to concentrate on the new event; and a change in subjective experience. The organism's state is different, physiologically and psychologically, from what it was before. It could be called a state of readiness for emotion or it could be called the beginning of emotion (Ellsworth, 1994b; Kagan, 1991), but I consider it an emotional experience. Whether one considers it the beginning of emotion or some pre-emotional state is an arbitrary semantic preference, not amenable to empirical test. As further appraisals are made, sometimes almost simultaneously and sometimes in response to changes in other components, they are also accompanied by physiological, motor, and psychological changes, and the emotional experience changes correspondingly. If the person is not just drifting along in default mode but is already experiencing some emotion, the appraisal of novelty will change the experience, sometimes only for a moment, sometimes more significantly, depending on the nature of the stimulus and the current emotion. The perception of relevant novelty means a change in emotion or a change *to* emotion, and thus can be considered a cause, even if is accompanied by other neural and physiological changes, and even if it is also a component.

The cause cannot be the external event, because that event can mean different things to different appraisers, a central premise of appraisal theory. Since human beings can only register a few elements of the blooming buzzing confusion that surrounds them, different people perceive different things, and a particular person may have an emotional reaction to an event that goes completely unnoticed by others. A nondescript person in a waiting room or a theater lobby will be merely part of the crowd to most people, but the sight of him will overwhelm his long-lost lover who presumed him dead. Although there are some universal antecedents of emotion (Ellsworth, 1994c; Frijda, 1994), in general my situation is not your situation. Temperament, physiology, culture, current goals, past life experiences, and the current situation have all been suggested as causes, and a plausible case can be made for any of them. Then the question is whether these phenomena influence emotions because they influence appraisals. I have argued that this is so in the case of culture (Ellsworth, 1994a), and I think that it may be generally true, but I have not considered all the possible exceptions.

Very often the appraisal of valence is simultaneous, or almost simultaneous (Zajonc, 1980), with the appraisal of novelty, and the "same" stimulus may elicit responses from delight to disgust. The appraisals of different people are different, but so are their physiological responses, their expressions, their subjective experiences, and their action tendencies. These are correlates of appraisals, and may begin simultaneously with the first appraisal. It is a continuous process, a recursive process, with all components influencing and being influenced by the other components. This is why the question of cause is not a question that makes sense to me, and why I prefer the term "emotional experience" to the term "emotion."

Appraisals and Basic Emotions

So novelty may often be the beginning of emotion, but even that single appraisal can be considered an emotional experience, something like simple interest, or alert awareness. With additional appraisals it may become apprehension, or annoyance, or amusement, or terror, but the experience is emotional before it corresponds to a recognized emotion label. For the theorists that Moors (2013) calls "subemotional parts theorists" a person can have a multitude of emotional experiences that do not correspond to the categories proposed by any basic emotion theorists.

Appraisal theorists (Roseman, 1984; Scherer, 1984; Smith & Ellsworth, 1985; and to some extent Frijda, 1986) introduced the idea of appraisals by trying to show that the emotions proposed by basic emotions theorists—joy, sorrow, fear, anger, and so on—could be broken down into more basic elements, the appraisals, which could be combined and recombined in different ways to characterize these emotions: Each of the emotions in basic emotion theories was associated with a distinctive combination of appraisals. The basic emotions were not the fundamental units (Ortony & Turner, 1990). Basic emotions theories were the dominant psychological theories of emotion at the time, and it is important for any new theory to show that it can account for the central phenomena of previous theories. So demonstrating that the commonly accepted basic emotions could be seen as combinations of more fundamental component processes was probably the right first step, and a good way to draw attention to appraisal theory. However, it had at least two regrettable consequences.

First, it suggested to some critics that we were just like the basic emotions theorists, the only difference being that we were trying to describe the basic emotions in terms of their component appraisals (Barrett, 2006b). That of course is not true. Most appraisal theorists have consistently argued for a near infinite

number of emotional states, of which the "basic emotions" represented only a few. These few were important, both because there was some consensus about them among basic emotion theorists and because they were common across cultures and had names in most languages, but almost no one believed that they accounted for the vast variety of emotional life. Some basic emotion theorists, such as Plutchik (1980), proposed that additional emotions were produced by blends of the basic emotions (e.g., love is a blend of acceptance and joy), but this was never a very satisfactory proposal because the term "blend" was more a metaphor than a description of an actual mechanism, and the blends still only left us with a small, finite number of discrete emotional states. Appraisal theorists argue that small variations in any of the appraisals—a feeling of slightly less certainty or slightly more control, for example—change the emotional experience through thousands of subtle, nameless variations. One of the fundamental goals of most appraisal theorists was to move us beyond the idea of emotion as a finite set of distinct categories, while at the same time going beyond constructionist theories like that of Schachter and Singer (1962) by providing clear criteria for the kinds of situational interpretations that matter most in the differentiation of emotions. In the first major empirical study of appraisal theory, Craig Smith and I included 15 emotions, including pride, hope, challenge, and frustration, that had not been carefully considered by any basic emotion theorist since Darwin.

Second, and more important, this initial strategy distracted attention from three fundamental assumptions of the appraisal theories of Scherer (e.g., 1984), Frijda (e.g., 1986), and Ellsworth (e.g., 1991): (a) Appraisals are continuous, not categorical, so an infinite number of combinations is possible; (b) a person can feel emotional even if the combination of appraisals does not correspond to any of the emotions in basic emotion theories, or to any of the emotions designated by a term in her language; (c) emotional experience is not a state, but a process, with changes in the appraisals, the bodily responses, and the action tendencies all providing feedback to each other and transforming the emotional experience.

We specified the combinations of appraisals that correspond to the emotions in basic emotion theories, but we never thought these particular combinations accounted for all emotional experience. A person can feel emotional even if only one or two appraisals have been made, and even if there is no word to describe the feeling. This can happen in pretty simple situations, like hearing a faint unidentifiable noise (Darwin, 1872, Chapter 9), where the perceiver's feeling might shade from interest to apprehension to annoyance at the interruption. It can also happen in some of the most significant emotional experiences in life, often, but not always, moments of ambivalence or powerful conflicting demands: you have met the only woman you could ever really love, but she is married; your clear duty is to punish an offender, but you are deeply reluctant; your beloved father is drifting away into the world of Alzheimer's disease. Does Hamlet *ever* feel one of the six basic emotions? Much of literature is about emotions that have no clear-cut labels, and we have no trouble understanding them or empathizing with the characters.

I have no illusions that appraisal theories, at least in their current form, are going to get us to Hamlet or Lear, or even to Harry Potter. Beatrix Potter is more like it. The appraisal dimensions so far identified can account for a great deal of emotional differentiation, but cultures, families, and individuals may evaluate the world with additional, sometimes even idiosyncratic appraisals, and no two situations are identical. Appraisal theories can get us to the right branch of the emotional tree, but not to the right twig; to the neighborhood, but not to the street address.

Consider the appraisal of agency. Anger is generally seen by appraisal theorists as involving appraisals that some other person (human agent) has done you harm (negative valence). But people vary enormously in their readiness for anger, even when they have been harmed by someone else, because additional appraisals matter to them. The intentionality of a human agent, for example, might make a huge difference to some people, so that they would be slow to anger towards a person who was inconsiderate but not malicious, whereas other people might get angry at a dog or a baby who got in their way. Or a person or culture might have a competing goal, such as maintaining a self-image as a pacifist, that makes anger and its associated action tendencies seem unacceptable (Briggs, 1970). It is possible that anger and the urge to hurt might be the initial reaction even of the pacifist, but appraisals and emotions are not frozen in the moment of the initial perception, but constantly evolve as other beliefs, values, and memories come to mind and as the situation changes. This modifiability of the initial response is one of the evolutionary advances of emotion over the fixed stimulus–response sequences of other species (Ellsworth & Scherer, 2003). The pacifist and the bully, or the person from the northern or southern United States, for that matter, will respond differently to their first mental reaction to the provocation: one quickly reappraising or suppressing, the other perhaps bolstering it. Appraisals of self-agency and nonhuman situational agency can be equally complex. If I caused the problem, was it stupidity, pressure from my companions, or what? Where am I on the slippery slope between mistake and malice? Appraisals of nonhuman agency also allow for many possibilities: I could see my misfortune as caused by fate, God, evil spirits, bad luck, the conjunction of the stars, or even regression to the mean, and these variants of the situational agency appraisal will affect my emotional experience.

Several appraisal theorists have begun to propose finer differentiations in the appraisal process. Ellsworth and Scherer (2003), for example, have pointed out that uncertainty is not a single, simple appraisal. There are quite a few ways in which one can be uncertain about a situation. One can be uncertain about what is actually happening; one can know what is happening but be uncertain about where it's leading, what will happen next; one can be uncertain about the appropriate response; one can know what the appropriate response is but be uncertain about one's ability to carry it out, and so on. Scherer (2013) similarly parses the appraisal of valence, usually thought to be so basic and so simple, and shows that there are many different ways in which an event can be seen as good or bad. We can go much farther than we have in refining appraisals, but I do not think that we will ever develop a complete set that accounts for all emotional experience. Still, appraisal theorists have gone

much farther than Schachter and Singer or other vague constructionist theories in specifying what it is about the perception of the situation that differentiates emotional experience. They can tell us the general nature of the emotion a person is feeling, which is more than other theories can do, even if they cannot account for the precise nuances.

New Questions

Language

So, if emotional experience is an ever-changing process, a river rather than a collection of separate pools, why have most theorists from Aristotle to Ekman, and most ordinary people, thought of emotions as discrete categories? I expect that language plays a major role here. At least in English, we think in terms of nouns and categories; we classify by naming. Most of the first words English-speaking infants learn are nouns (Tardif, Gelman, & Xu, 1999): This is a ball, this is a book, this is daddy. We habitually divide processes and continua into distinct units. The *New York Times* weather report categorizes the constantly changing atmospheric conditions as clouds, fog, haze, ice, partial clouds, rain, rain showers, sun, snow, snow showers, thunderstorms, and wind, more categories than exist in most basic emotion theories, but still not nearly enough to capture the experience of being outdoors. A cloudburst is not the same as days of light, continuous rain, any more than acute anguish is the same as depression. All cultures have labels to divide the color spectrum, which has no built-in divisions, into categories (Berlin & Kay, 1969). We have created labels for categories of intelligence (moron, cretin, intellectually disabled, genius), mental health (insanity, schizophrenia, borderline personality disorder), legal responsibility (negligence, intent, purpose), and, perhaps most perniciously, human beings (Black, White, Brown, Yellow, Red; Gould, 1996). At some level, well-educated people know that these are fictions, arbitrary lines, but they are deeply ingrained habits of thought, difficult to avoid. We, and especially we Westerners, are categorical and dispositional (Dweck, 2006; Ross & Nisbett, 1991).

Reliance on linguistic categories creates problems for researchers as well, though at this time I can think of no other methods that will enable us to study the subjective experience of complex emotions. Expressive and instrumental behavior provide only partial information, and so far we have no clear evidence that the central or peripheral neural processes we can measure correspond exactly to the subjective experience. So we use lists of words designating emotion categories. We ask people to rate how strongly they are feeling each of 2 or 6 or 10 or sometimes more emotions, and these ratings provide a great deal of useful information. But they do not necessarily reflect the person's experience. If the person has made a combination of appraisals that does not correspond to one of the emotion labels we have provided, she will attempt to approximate that feeling in her ratings. But if she rates herself as feeling happiness at 6 and fear at 3, we cannot conclude that she is feeling "mixed emotions"—happiness and fear. She may have an indivisible, coherent feeling that is not captured by any of the words we have provided, and she does her best to approximate it by using the materials at hand.

Open-ended descriptions of emotion are richer, but they also raise problems for researchers because what people say or write includes many ways of describing feelings that go beyond the labels that we usually use. They come up with analogies: "It was like finding out that there was no school today"; "it was as though I had cheated"; "it was like being betrayed." They describe situations: "When I walked in, everyone stopped talking"; "My friend was crying uncontrollably, and I didn't know what to do"; "I wasn't paying attention and oh-my-god there was this tree right in front of me." They use many words for emotions that are not used in scientific research: I felt stupid, appreciated, wild, effective, secure, attractive, insulted, ignored, undeserving … (Boster, D'Andrade, & Ellsworth, 2012). But when we come to analyze these data, typically we code them into our usual emotion categories, sacrificing much of the richness and insidiously perpetuating the categorical point of view. Even theorists who completely reject the idea of basic emotions and categorical distinctions use emotion categories in their research for lack of a superior alternative. Klaus Scherer does, Nico Frijda does, Craig Smith does, Lisa Feldman Barrett does. I do.

Another reason for people's reliance on categorical verbal labels may be that it is unsettling to feel emotional in a way that cannot be defined. With positive emotions this may not be much of a problem: the person's attention is on enjoying the moment, without worrying about the exact nature of the pleasant feelings. This may be why there are fewer verbal terms for positive than for negative emotions (Averill, 1980b), and why happiness has emerged as a lazy catchall term for positive states. But negative emotions that cannot be named may provoke or increase uncertainty, which may in turn increase their unpleasantness (Maslach, 1979). Just as a doctor's diagnosis of one's vague pains may create a reassuring sense of control, even if the diagnosis is negative, so might a clear, bounded label for one's undefined emotional malaise.

Having a word for an emotional state also makes the experience of the emotion more available. The words of a language may act as magnets in the multidimensional universe of appraisals, so that a person who has some of the appraisals characteristic of a labeled emotion will be drawn towards the word and likely to use it to define the ambiguous feeling. Emotional experiences are involving, unstable, and often disturbing, and linguistic categories provide a conceptual clarity that helps us to interpret ambiguous experiences as recognizable ones, to communicate them to others, and to behave accordingly (cf. Scherer, 1994). Yu Niiya and I have studied the Japanese concept of *amae*, often regarded as culturally unique, which is used to describe both an interpersonal relationship and the specific cluster of emotions it entails, emotions related to dependence, trust, and a feeling of closeness—for example, a relationship in which you can ask someone to do a relatively large, even inappropriate, favor for you and expect that the person will do it without resentment. We have found that Americans have emotional experiences very much like *amae* (Niiya & Ellsworth, 2012; Niiya, Ellsworth, & Yamaguchi, 2006), although the appraisals are slightly different, with a little more emphasis on control and little less on intimacy,

but it is not an easily available category of emotion in America—it has no label, and so is not a common, easily recognizable aspect of everyday life as it is in Japan.

The study of how language affects emotional experience is an important direction for future research—cross-cultural, developmental, and possibly even historical. Like *amae*, there are many words for emotions that are culturally unique or that exist in some languages but not in others. Even words that are used as direct translations may have different associations and connotations (Mesquita & Leu, 2007). And over the centuries the meanings of common emotion words, including the words for "basic emotions," have changed. The English word *sad* comes from an Old English word meaning *sated* or *satisfied*, evolving into a meaning of *heaviness or weariness*, and finally into its current meaning. The Anglo-Saxon word for *sadness* was *ange*, which slowly evolved into the current words *anguish* and *anger* (*Shorter Oxford English Dictionary*, 2002). Words once common have disappeared, and new ones are constantly emerging.

Decades ago Brent Berlin and Paul Kay carried out research on language and the perception of color, which, like emotion, is a multidimensional space divided by every language into categories (Berlin & Kay, 1969). They found that the emergence of color terms followed a fairly orderly progression: If a language had only two color terms, they were dark and light. If a language had three terms, the third was always red; if four, the fourth was always something in the yellow–green range, and so on up to six terms. A similar study of the language of emotion would be fascinating. If a language has only two emotion words, are they "feels good" and "feels bad"? Are there emotion words that are universal, and do they correspond to those in the languages with fewest terms? Do they correspond to appraisal distinctions such as valence or agency? Are there languages in which nouns are not the main way of dividing up the world of emotions, languages in which processes or action tendencies play that role? Do people who speak languages with more emotion terms have more differentiated emotional experiences? The answer is not a foregone conclusion. Berlin and Kay (1969) found that people whose languages included very few color terms could distinguish among colors (when asked whether they were the same or different) as well as people with much more differentiated emotional vocabularies. It may be that immediate experiences are less constrained by language, and therefore more differentiated, than remembered or imagined experiences (Robinson & Clore, 2002).

The same question could be asked developmentally. When children learn a new emotion word, how does it affect their emotional experience? Is the order in which emotion words are learned more or less the same among children in the same culture? In different cultures? It is obvious from developmental research that language is not necessary for emotional experience. In most children, happiness, contentment, interest, distress, fear, and anger are observed before the child has any language at all, and certainly before the child has words to describe the feelings (Izard et al., 1995). Words for emotion develop fairly late compared to words for animate or inanimate objects, perhaps because the child is perfectly capable of communicating emotions nonverbally and doesn't need words to do so. My older daughter didn't begin to name emotion-like concepts until she was 18 months old ("hurt"), with "like" and "cry" emerging at 19 months, and "mad" and "yuck" at 21 months. By this time she already had words for rocking chair, brontosaurus, slippery, and over 40 different animal names, all words far more rarely used in spoken English than the basic emotion terms. These issues raise problems for constructionist theories that consider differentiated emotion to be a product of knowledge and experience (Barrett, 2006a; Schachter & Singer, 1962), because emotional experience clearly precedes emotional conceptualization. Indeed how could it be otherwise?

Emotional Habits and Automaticity

Language and culture are not the only forces that make emotions and their associated appraisals accessible and automatic. Maturation and life experience serve the same function. Discussions about which appraisals are more or less automatic and which are more or less conscious overlook the fact that *any* appraisal or combination of appraisals can become automatic over time, as the type of eliciting situation becomes more familiar.

The first time a person encounters a particular situation the appraisal process is very different from the tenth time. Consider the first time someone swerved around you to take the one remaining parking place you were aiming for; the first time you saw a little snake; the first time you approached someone and she smirked and turned away; the first time someone flirted with you. Appraisals of a truly novel situation, except for the few biologically built-in stimuli, are slower, less certain, and more conscious than they will be the 30th time the situation is encountered, and the emotion less well defined. Babies, who encounter novel situations every day, look to their parents for information about what to feel (Campos, Bertenthal, & Kermoian, 1992). By the time a person has experienced a situation several times, and it is more familiar, the emotional response is more automatic, and the person will immediately experience the full-blown emotion—anger, for example, at the person who has cut her off and taken her parking place—with little or no awareness of the component appraisals (Ellsworth & Scherer, 2003; Frijda, 1986).

In my research, I have consistently gotten stronger, more significant results for people's reports of emotion than for their reports of appraisals, although the appraisal results are significant. This is because I have generally studied situations that are familiar to the participants, or remembered situations from their own lives where I have asked them to think about a time when they felt a particular emotion. The emotion is salient and complete. The appraisals are generally out of conscious awareness, though they can be recovered when I ask about them.

As we mature, and many more events become familiar, the process becomes more automatic, we are more likely to experience just the emotion, with less access to the component appraisals. In the adult, in often-repeated emotional experiences in which similar combinations of appraisals, physiological responses, motor responses, action tendencies, and subjective experience have occurred repeatedly, it may be that components other than appraisals can set the process in motion. Thus for

example, if stirring music elicits a bodily response like that associated with an emotion, it may also elicit the relevant appraisals and subjective experience.

This is why I mistrust the results of some neuroscience studies that require repeated presentation of the same emotional stimuli—pictures or situations—over and over again, sometimes dozens of times. The emotional response to the 20th presentation cannot possibly be the same as the response to the first, and it is unclear to me what an average across these multiple presentations could possibly represent—certainly not the person's response to her first encounter with the stimulus, which is presumably the one that we are interested in.

Some simple appraisals, such as the perception of novelty or a bitter taste, are perhaps almost always automatic, but even quite complex appraisals, such as incompatibility with moral norms, which are wholly absent in young children, can become instantaneous and automatic in the adult (Bloom, 2004).

Future Directions

Appraisal theories open a multitude of possible directions for future research, several of which are proposed by other contributors to this special section. I would like to see research designed to study emotions as processes, rather than as static entities. First, one could look at how particular emotional episodes change over time, tracing the changing appraisals and their correlates. This may not require abandoning verbal measures, but it will involve supplementing them. Jeff Larson (Larsen & McGraw, 2011) has participants continuously turn two dials corresponding to different emotions as they listen to music, and research groups in Geneva and in Leuven have also begun to study emotional dynamics over time. As the measurement of neural processes in the brain develops, we may soon be able to trace brain changes from the initial perception of a novel event to a behavioral response, and even beyond. Experimentally, we could introduce new information in the middle of an emotional experience designed to change the appraisals in specific ways and examine the neural consequences.

Second, we could test the hypothesis that emotions become more automatic as eliciting situations become more familiar, with appraisals being slower, more hesitant, and more sequential when the stimulus is unfamiliar and becoming faster and more coherent after repeated encounters with similar situations. These differences in responses to similar episodes across time could be studied with both brain and behavioral studies.

Third, and closely related, I think a major gap in our understanding of appraisals and emotions is the lack of research on the development of emotions in infancy and early childhood. Appraisal theories make the clear and unique prediction that emotional experiences are not possible for children until they have the capacity to make the necessary component appraisals. Fear and surprise should not occur, for example, until the infant can distinguish certainty from uncertainty, and has formed expectations that can be disconfirmed. Anger and distress should not be distinguishable until infants can attribute their pain to the actions of another person. There is already considerable evidence that emotional experiences like pride emerge when the baby realizes that she herself can make things happen (White, 1959). These emotions emerge well before the baby has words to describe them. Also, since so many situations are new to children, it may be easier to observe appraisal components before they have coalesced into holistic, habitual emotional responses.

Eventually the child does have words for talking about emotions, and another very interesting avenue for research is to explore how language affects the development of emotional experience. Do children's emotional experiences, as well as their perceptions of emotions in others, increasingly correspond to the emotion categories in their language? These studies would involve research on children growing up speaking different languages, comparing languages where words for certain kinds of emotional experience are commonly used with languages without words for those experiences. If the earliest emotion words learned by children in one culture are quite different from the first words of children in another culture, it would be interesting to look at differences in their emotional perceptions and experiences. If there are languages in which the common vocabulary emphasizes categorical nouns to describe emotions less than English, perhaps emphasizing appraisals or action tendencies or processes more, those comparisons would be especially interesting. Finally, it would be interesting to compare children or cultures with more words to describe emotions to those with fewer, to see whether in fact the differentiation in the language was reflected in differentiation in experience, for example, in the perception of similarities and differences in emotional-eliciting situations or expressive behaviors.

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