



THEORETICAL APPROACHES TO EMOTION

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ABSTRACT

Four major theoretical perspectives on emotion in psychology are described. Examples of the ways in which research on emotion and speech utilize aspects of the various perspectives are presented and a plea is made for students of emotion and speech to consider more self-consciously the place of their research within each of the perspectives.

1. ARE THEORIES OF EMOTION NECESSARY?

Fifty years ago, B. F. Skinner (Skinner, 1950; Skinner, 1972) asked "Are theories of learning necessary?" Calling theories, especially those that traffic in intervening variables or that appeal "to events taking place somewhere else, at some other level of observation, described in different terms and measured, if at all, in different dimensions" (Skinner, 1972, p. 69) from the phenomena they seek to explain, "fun" but "useless," Skinner argued that theories of learning are ultimately "a refuge from the data" (Skinner, 1972, p. 72) and so should be abandoned by any self-respecting science of behavior. I would like to ask the same question of theories of emotion; namely, "Are theories of emotion necessary?" More specifically, I would like to ask, "Are theories of emotion necessary--and useful--to students of emotion and speech?" Although it is beyond the scope of this paper, I believe it can be shown that Skinner's attack on theory was wrongheaded and that his conviction that a scientific psychology could make do without theories and just "get back to an observable datum" (p. 72) was belied by his own arguments, which are saturated by the kind of theoretical statements to which he objected. Contra Skinner, I will argue that theories of emotion are absolutely essential for students of emotion, no matter what aspect of emotion they study. I will further argue that both contemporary and classic theories of emotion are eminently useful to students of emotion and speech.

I know that you all make reference in your work to very specific theories of how emotion gets encoded into speech and the like. I would like to convince you of the centrality and usefulness of the "big" theories of emotion to your research. To get there, I will first describe four of the most influential theoretical perspectives and research traditions in the study of emotion in the past 125 years or so. I will then briefly describe what I see as some of the ways in which the four perspectives have begun to converge. Next, I will attempt to locate some examples of the research presented at this conference within the four perspectives. This will give you a sense, I hope, of the ways in which students of emotion

and speech already make use of the "big" theories of emotion, if sometimes only implicitly. Finally, I will outline what students of emotion and speech might gain from an integration of theories from the four perspectives.

2. FOUR THEORETICAL PERSPECTIVES

When Skinner (Skinner, 1950) talked about theories of learning, he was actually talking about families or kinds of theories. I shall for the most part be doing the same. A survey of contemporary theory and research on emotion in psychology reveals four different general theoretical perspectives about how to define, study, and explain emotion. I have called these the *Darwinian*, *Jamesian*, *cognitive*, and *social constructivist* perspectives (Cornelius, 1996). Each of these perspectives has its own set of assumptions about the nature of emotion, about how to construct theories about emotion, and about how to conduct research on emotion. Each perspective is also associated with its own body of empirical research. Because each of the perspectives has its own more or less unique way of thinking about emotions, has endured in time, and has its sometimes passionate cadre of adherents whose research exemplifies "how things are done" within the perspective, it is appropriate to speak about each perspective as embodying its own tradition of research. There are, of course, several areas of overlap among the four perspectives and their associated research traditions, this is especially true of the Darwinian and Jamesian perspectives. However, for the most part, each ultimately presents a quite different account of what emotions are all about.

2.1 The Darwinian Perspective

The central organizing idea of the Darwinian perspective is the notion that emotions are evolved phenomena with important survival functions that have been selected for because they have solved certain problems we have faced as a species. As such, we should see the same emotions, more or less, in all humans. In addition, since humans share an evolutionary past with other mammals, we should expect to observe similarities in the emotions of closely-related species.

The Darwinian perspective and its associated tradition of research had their beginnings in Darwin's 1872 book *The Expression of Emotion in Man and Animals*. The book, whose origin lay in Darwin's discomfort with earlier attempts to explain emotional expressions in terms of special creation, described in Darwin's typically marvelous attention to detail the facial expressions and bodily movements that accompany several emotions in humans and other animals and presented

a simple theory of the evolution of such expressions and movements. Although contemporary students of emotion within the Darwinian tradition rarely cite the specifics of his theory of the evolution of emotion and emotional expressions, Darwin's ideas have been enormously influential. His legacy to the study of emotion in psychology and biology consists of his use of the theory of evolution by natural selection as a framework for understanding emotional expressions and, by extension, emotions themselves, and his insistence that emotional expressions must be understood in terms of their functions and, hence, survival value.

There are many contemporary students of emotion who have followed Darwin's lead in trying to understand emotions from an evolutionary perspective, even if they do not always follow the particulars of how Darwin understood emotional expressions to have evolved. Foremost among these are, of course, Paul Ekman, Carroll Izard, Alan Fridlund, and the late Sylvan Tompkins. The work of Joseph LeDoux (1996) also fits neatly into this perspective. Under the influence of Tompkins, Ekman and Izard and their colleagues and students have expended a great deal of effort over the last 30 years attempting to demonstrate the universality of certain human facial expressions of emotion. Although there are those who question what these findings ultimately mean, most notably Alan Fridlund (1994) and James Russell (1994), Ekman and colleagues (Ekman, Friesen, O'Sullivan, Chan, Diacoyanni-Tarlatzis, Heider et al., 1987) have amassed an impressive body of evidence for the universality of a small number of facial expressions of emotion, what I call the Big Six: happiness, sadness, fear, disgust, anger, and surprise (Cornelius, 1996).

The number of such universal facial expressions varies somewhat depending on whom one is reading. Ekman says six (or seven--he sometimes includes contempt), Izard identifies ten, Robert Plutchik figures there are eight. Whatever the number, these are seen to correspond to a set of so-called "fundamental," "basic," or "primary" emotions. These emotions are considered fundamental because they represent survival-related patterns of responses to events in the world that have been selected for over the course of our evolutionary history. According to Plutchik (1980), each fundamental, basic, or primary emotion, fulfills a specific "adaptive role in helping organisms deal with key survival issues posed by the environment" (p. 129). These emotions are also considered to be fundamental because all other emotions are thought to be somehow derived from them.

Notice here how focusing on emotions as adaptive responses allows Darwinians to make comparisons of emotions across species with relative ease. Plutchik (1980) is able to say that the concept of emotion applies to all organisms, from amoebae to humans, because he compares emotions in terms of their functional equivalence. Although the specific behaviors involved in the fear response of a rat and a human may be very different, and may differ from rat to rat and human to human, what those behaviors accomplish is the same. This is also what allows LeDoux to make inferences about the neural architecture of emotions from the brains of rats to the brains of humans: The particulars of fear may differ, but "the brain systems involved in mediating the function are the same in different species" (LeDoux, 1996, p. 123).

If there are indeed a small number of basic or fundamental emotions, each corresponding to a particular evolved adaptive response pattern, then we should see those emotions represented in more than just a set of universally recognized facial expressions. It should be possible to see the traces of evolution in other aspects of emotion as well. Philip Shaver and his colleagues have gathered evidence that they say indicates that there are evolutionarily determined, cross-cultural universals in the *meanings* of different emotions. Shaver and colleagues (Shaver, Schwartz, Kirson, & O'Connor, 1987; Shaver, Wu, & Schwartz, 1992) asked people in three different cultures (Italy, China, and the United States) to sort a long list of emotion names into categories based on their similarity to one another. Hierarchical cluster analysis indicated that six emotions could be described as "basic-level emotion categories" with a high degree of overlap across the three cultures. The six emotions were love, joy, surprise, anger, sadness, and fear. Notice how similar this list is to Ekman's.

2.1 The Jamesian Perspective

Theory and research in the Jamesian tradition was inspired by William James' writings on emotion, in particular, his 1884 article "What is an emotion?" Almost since the day of its publication, psychologists of various kinds have debated the truth of James' famous equation of emotions with the perception of bodily changes: "bodily changes follow directly the PERCEPTION of the exciting fact, and... our feeling of the same changes as they occur IS the emotion" (James, 1884, p. 189-190). James insisted that it would be impossible to have emotions without bodily changes and that bodily changes always come first. To understand how James adopted this position, one must first appreciate his debt to Darwin.

Although James was concerned with explaining the nature of emotional *experience* while Darwin was concerned with emotional *expression*, both thought of emotions as environmental adaptations with important survival-related functions. Like Darwin, James considered emotions to be more or less automatic responses to events in an organism's environment that helped it to survive. According to James (1884), "the nervous system of every living thing is but a bundle of predispositions to react in particular ways upon contact of particular features of the environment" (p. 190). The bodily responses associated with emotions, be they expressive responses, visceral changes, or instrumental behaviors, are examples of such predispositions. Contemporary Darwinians and Jamesians who refer to emotions as "action tendencies" (Frijda, 1986) are making a similar claim. Given this deep level of connection between Darwin and James, it should come as no surprise that there is considerable cross-over between the Darwinian and Jamesian traditions in psychology.

According to James then, we experience emotions because our bodies have evolved to respond automatically and adaptively to features of the environment that have survival-related significance to us. Our bodies respond first and our experience of these changes constitutes what we call emotion. This formulation seems clear enough until we start asking precisely what is meant by bodily changes. The formulation

also begs the question of how bodily changes are initiated by the perception of environmental events, a question that would not be dealt with adequately until the so-called cognitive revolution in psychology.

When James (1884) said, "we feel sorry because we cry, angry because we strike, afraid because we tremble" (p. 190), he was, as Laird and Bresler (1990) have pointed out, describing several very different kinds of bodily responses. Crying is an expressive behavior, striking someone is an instrumental response, and trembling is likely the result of physiological changes. Although many critics of James faulted him for proposing what they saw as the absurd notion that we "are afraid because we run," James considered all bodily responses as potential sources of the feelings we call emotions.

For James, what was important was that the body responded in some more or less preprogrammed manner to the environment and that response was then perceived. Although he did seem to privilege visceral activity, emotions, for James, could be based on bodily changes of a variety of types and combinations. Much more important for James, and certainly for the generations of Jamesians who followed him, was the notion that each emotion must be accompanied by a unique pattern of bodily response. It is not too much of a stretch to say that research and theory in the Jamesian tradition has been the history of the attempt to demonstrate this last proposition. It is a long, contentious, and complex history filled with passionate adherents to James' position and many equally passionate adherents to the opposite position. After roughly a century of research on the matter, at least three conclusions, I think, are warranted.

First, James' insight that if he had no body, he would be "excluded from the life of the affections" (James, 1884) appears to have some validity. Studies of people with spinal cord injuries (Hohmann, 1966; Chwalisz, Diener, & Gallagher, 1988) seem to show that feedback from the body, in particular, the organs innervated by the sympathetic nervous system, contributes something important to the experience of emotions, most likely to their intensity. People whose spinal cords have been lesioned show a decrease in the experience of the intensity of certain emotions and the degree of impairment seems to correlate with the degree of injury, with lesions higher on the spinal cord associated with more impairment. The conclusions one may draw from such studies are limited, however, by the fact that all of the participants in them were still able to experience feedback from their facial musculature, which has been shown to have a role in determining the experience of emotions, all of the participants could still rely on their memory of what their emotions were like before they were injured, and post-injury decreases in the intensity of experience were demonstrated for only a select group of emotions, primarily those associated with anger. Some emotions, for example, love and compassion, seemed to show an increase in intensity after injury. Thus, having the functional equivalent, in Jamesian terms, of no body seems to not exclude one entirely from the life of the affections, as James had feared.

Second, there does indeed seem to be some differentiation of emotions at the level of the autonomic nervous system. Levenson and his colleagues (Levenson, 1992; Levenson,

Ekman, & Friesen, 1990) have presented convincing evidence that a small number of emotions display autonomic specificity. Using a "directed facial action task" and a "relived" or re-imagined emotion task, Levenson and colleagues were able to detect reliable differences among fear, anger, disgust, and happiness in the patterns of heart rate and finger temperature change associated with each emotion. The changes of this sort that have been observed thus far have been rather small, however, and the patterns so diffuse that it is difficult to make much of an inference about why the autonomic changes look the way they do. We shall obviously see more of this kind of research in the future as imaging techniques continue to look further and further into the body in non-invasive ways.

Third, as James predicted, reliable changes in affect and autonomic activation appear to follow posed facial expressions of emotion and the bodily postures associated with positive and negative affect. Studies by Levenson and his colleagues (Levenson et al., 1990), Laird and his colleagues (Laird, 1984), and Strack and his colleagues (Strack, Stepper, & Martin, 1988), using a variety of methodologies, have shown that emotions follow facial expressions. Stepper and Strack (Stepper & Strack, 1993) have shown that postural feedback may drive emotional experience as well. The evidence for such changes is not incontrovertible, however, and it is unclear why physiological and experiential changes should follow making faces. Several theorists (e.g., Levenson et al., 1990) have proposed that emotions consist of "affect programs" that involve activation of a number of different expressive, motor, and experiential systems. Activation of any one of these by itself may activate the others. There is obvious relevance here for those who study emotion and speech, since one would assume that prosody would be one of the systems activated by such affect programs and, hence, capable of activating them.

2.3 The Cognitive Perspective

Even under the current hegemony of evolutionary psychology, if any of the four theoretical perspectives on emotion could be said to be dominant, it would be the cognitive perspective. This is in part because the cognitive perspective has been incorporated so thoroughly into the other three. I trace the beginning of the modern cognitive approach to the study of emotions to the work of Magda Arnold, but the origins of the perspective are much older, dating back to at least the Hellenistic philosophers (Nussbaum, 1994). The central assumption of the cognitive perspective and its associated tradition of research is that thought and emotion are inseparable. More specifically, all emotions are seen within this perspective as being dependent on what Arnold (1960) called *appraisal*, the process by which events in the environment are judged as good or bad for us.

Arnold faulted James for not specifying what he meant when he said "bodily changes follow directly the PERCEPTION of the exciting fact" (James, 1884, p. 189). How does that perception take place?, Arnold asked. What kind of perception is it? And how does it lead to the kinds of bodily changes that so interested James? For Arnold and those who have followed her in the cognitive tradition, the missing link

is the process of appraisal. Just as James could not conceive of an emotion without a body, so too Arnold could not conceive of an emotion without an appraisal. Every emotion is associated with a specific and different pattern of appraisal. These patterns provide the link between particular characteristics of the person or organism, his or her learning history, temperament, personality, physiological state and particular characteristics of the situation in which the person or organism finds him or herself. The notion of appraisal, for many modern cognitively-oriented emotion theorists (e.g., Frijda, 1986), goes hand in hand with the idea that emotions are "action tendencies." The process of appraisal informs the organism of particular features of the environment and brings about a state of readiness to act on those features. They thus fill the void left by James' failure to say much about what he meant by perception.

Cognitive emotion theorists have frequently been criticized for over-intellectualizing emotions, leaving the person lost in thought. Zajonc (1980) and, more recently, LeDoux (1996) fault adherents to the cognitive perspective for positing the necessity of a process that requires deliberative thought, one that is, moreover, not applicable to animals other than humans. Both Zajonc and LeDoux see the cognitive perspective as unworkable because emotions seem to happen much faster than perception and because it is possible to elicit emotional reactions outside of awareness of the eliciting stimuli. Their critiques, however, rest on a misunderstanding of the process of appraisal, at least in terms of how Arnold defined it. For Arnold, appraisals are best thought of as what she called "sense judgments," which she saw as being "direct, immediate, nonreflective, nonintellectual, [and] automatic" (1960, p. 174). The whole point of appraisals, for Arnold, is that they are *not* deliberate. They are called forth by particular patterns of stimuli in the world and themselves automatically call forth particular patterns of responses to those stimuli. In this regard, Arnold looks very much like a Jamesian. She is simply a little more clear about how the process of perception takes place. It is somewhat ironic that LeDoux's (1996) dual circuit model of emotional information processing so nicely fits with Arnold's definition of appraisal.

One of the implications of the cognitive perspective's insistence that every emotion has associated with it a particular pattern of appraisal is that if the appraisal is changed, the emotion should change as well. Some of the earliest research within the modern cognitive perspective, that of Lazarus and his students, was indeed aimed at demonstrating that emotional reactions to threatening events could be "short-circuited" by changing the way such events were appraised. In one of the earliest such studies, Spiesman, Lazarus, Mordkoff, and Davison (1964) showed that young men's affective responses to a gruesome film could be significantly altered by providing them with different ways to interpret the events in the film. Several subsequent studies have borne out the promise of this early demonstration of the power of using changes in appraisal to reshape emotional responses, most importantly as they relate to positive psychotherapeutic outcomes (see Catanzaro & Mearns, 1999).

Researchers within the cognitive tradition have expended a great deal of effort developing theories of emotion that

describe the specific appraisals associated with some of the more common and familiar emotions. The details of the theories differ somewhat, but they all employ the same strategy of delineating a set of primitive appraisal components or dimensions, e.g., pleasantness, control, certainty, responsibility, effort, etc., that are thought to underlie particular emotions (see, for example, Roseman, 1991; Smith & Ellsworth, 1985; and Scherer, 1998 for a review). More precisely, each emotion is thought to be generated by unique combinations of such components. In Smith and Ellsworth's (1985) scheme, for example, anger involves an appraisal of a situation as being unpleasant, the responsibility of another person, and as requiring a great deal of effort. Guilt involves appraising a situation as unpleasant, as being one's own responsibility, but as requiring little effort.

Appraisal theorists have had considerable success in demonstrating that emotional responses to various kinds of events can be decomposed into the appraisal components and relational themes that presumably gave rise to those responses (see, for example, Smith, Haynes, Lazarus, & Pope, 1993). This is often done by presenting participants with written scenarios in which the value of various appraisal components is systematically manipulated. Participants are then asked what emotions they would feel in each scenario. Notice, however, that such demonstrations are carried out "off-line" as it were. Aside from studies of the sort carried out by Lazarus and his colleagues at the very beginnings of the modern cognitive approach to emotions, there have been precious few studies that have actually manipulated the individual components of appraisal and examined what kinds of emotions result. In addition, as Scherer (1999) has convincingly argued, appraisal theorists have also not devoted sufficient attention to describing the process of appraisal. Filling a major theoretical and empirical lacuna in this regard, Scherer (1999) has recently presented a series of studies that support his component process model of appraisal (see Scherer, 1987) in which appraisal is seen as consisting of an invariant sequence of "stimulus evaluation checks" that extract certain kinds of information about emotion-eliciting events, particularly that having to do with novelty and pleasantness, before others.

2.4 The Social Constructivist Perspective

The youngest, most diverse, and certainly most controversial of the four theoretical perspectives is the social constructivist. Although social constructivism has been around for quite some time (e.g., in anthropology and sociology), it coalesced as an identifiable approach to the study of emotion in psychology only in the 1980's, most notably in the work of James Averill (1980) and Rom Harré (Harré, 1986). Important contributions to the ideas about the social construction of emotion have also been made by the anthropologist Catherine Lutz (see, for example, Lutz, 1988) and the philosopher Claire Armon-Jones (1986). Although there are those who vehemently oppose thinking about emotion from this perspective, it is a significant testament to the coming of age of the approach that a chapter on the social construction of emotions (Oatley, 1993) is included in the canonical *Handbook of Emotions* (Lewis &

Haviland, 1993) , in the section on "Basic Psychological Processes in Emotion" no less!

Breaking ranks with those who view emotions as primarily biological, as evolved adaptations, social constructivists believe that emotions are cultural products that owe their meaning and coherence to learned social rules. According to Averill (1980) , "emotions are not just remnants of our phylogenetic past, nor can they be explained in strictly physiological terms. Rather, they are social constructions, and they can be *fully* understood only on a social level of analysis" (p. 309).

Even hard-core Darwinians such as Ekman (1972) have acknowledged the role of culture in regulating emotional displays, but Averill and the other social constructivists suggest something much more radical. If you want to understand what emotions are all about, they say, look at what the emotions accomplish socially. You will then discover systems of culturally-specific rules that dictate how, when, and by whom particular emotions are to be experienced and expressed. Gender and social group differences in the expression and experience of certain emotions are no accident. Indeed, they reveal the way emotions are constructed within a culture to serve particular social purposes. Let me clarify what this means by turning to the emotion of anger.

Anger is often seen as a prototypically primitive emotion. It is on just about everyone's list of basic or fundamental emotions, aspects of what we consider anger in humans may be seen in the rage and aggressive responses of other animals, and it just "feels" primitive when we experience it. Anger must come from some phylogenetically deep part of our brains, right? Nothing could be further from the truth according to Averill. Far from being primitive, anger is a sophisticated emotion that rests on a complex pattern of socially-determined appraisals and that serves important social functions at both the interpersonal and social level. Even our feeling of being out of control and possessed by something primordial and animalistic when we are angry is socially constructed. To top it all off, rather than being the nasty emotion we all think of it as being, anger plays a positive and constructive role in our social relationships.

According to Averill (1982) , anger is elicited by the appraisal that one has been wronged intentionally and unjustifiably by another person. Anger, on this account, rests first and foremost on a moral judgment. When you say I have wronged you, you are saying I have violated some standard of behavior, whether it is a standard only you and I share or a standard more generally shared does not matter. What is important is that I have crossed some line. Anger, then, is about right and wrong. Anger is also about intentionality and justifiability and depends on some rather complicated attributions about a person's knowledge and intentions. You would not become angry with me if I accidentally caused you pain by yanking on your arm. If I did it intentionally, you might become angry, unless I was your doctor and I was ministering to your dislocated shoulder.

In western society, if one has been wronged, one is justified in seeking retribution. One cannot seek his or her

justification in a way that intentionally harms another person, however. Anger, in Averill's account, is a way to satisfy both of these social norms. Anger allows one to seek retribution for wrongs committed against oneself using the threat of aggression by slipping under the radar of the norm against intentionally harming others while doing so because anger is experienced as something that takes control of a person and temporarily makes him or her not responsible for his or her actions. The experience of being out of control is, Averill argues, an *interpretation* we place on our behavior. More properly, it is an interpretation that our culture places on our behavior.

Surveying the landscape of emotion in both western and non-western societies, Averill (1980) finds that there are many examples of behavior in which a person's actions are interpreted in this manner. In every case, this is done to allow the person to escape responsibility for his or her actions while accomplishing some important interpersonal or social work. Part of the social function of emotions, as Averill defines them, is to regulate behavior in this manner. Anger helps to regulate interpersonal relationships by establishing and enforcing the boundaries of what is considered proper and improper. Romantic or passionate love allows us to voluntarily relinquish some of our economic and social freedom (a premium in western, capitalist countries) in exchange for a stable relationship (Averill, 1985) . Even an emotion like fear, so seemingly of obvious adaptive significance, has important social and, indeed, moral functions (Armon-Jones, 1986) . Children fear not only those things that went bump in the night on the Pleistocene savanna, but they are taught to fear activities and people of which their social group disapproves.

Culture, for social constructivists, plays a central role in the organization of emotions at a variety of levels. Most importantly, culture provides the content of the appraisals that generate emotions. While the process of appraisal may be a biological adaptation, the content of our appraisals is cultural. Thus, the kinds of things that make people angry differ from culture to culture and from person to person. Culture, in the form of social rules that provide what might be called "scripts" for emotion, also organizes emotions behaviorally. *How* we get angry or fearful is culturally determined. This is why the particulars of anger and fear look different in some cultures. Recognition of the role of culture in specifying what we get emotional about and how we do it provides a powerful tool for understanding the larger social functions of emotions. Elizabeth Spellman (1989) , for example, has examined the ways in which the prohibition against women's anger in many societies may be seen as an aspect of the more general subjugation of women.

3. INTEGRATING THE FOUR PERSPECTIVES

While the four perspectives and their associated traditions of research have quite different origins, and theorists and researchers within each perspective define emotions differently, often ask very different kinds of questions about the nature of emotion, and occasionally get into heated disputes with theorists and researchers from other

perspectives, there is evidence that the four perspectives have begun to converge and that they will continue to do so. Convergence, as I have already pointed out above and elsewhere (Cornelius, 1996), is most evident among theorists and researchers in the Darwinian and Jamesian traditions. Paul Ekman, self-consciously the foremost Darwinian of our day, is also very much a Jamesian. His work and the work of his colleagues (e.g., Levenson) on the physiological concomitants of the facial expressions associated with the so-called fundamental emotions puts them in both camps. However, by emphasizing the universality of not only the facial expressions and bodily changes associated with different emotions but their eliciting conditions as well, Ekman's work, and that of Carroll Izard as well, combines aspects of the Darwinian, and Jamesian perspectives *and* the cognitive perspective. Moreover, Lazarus, who is identified most closely with the cognitive perspective, has expressed opinions about the universality of facial expressions and about autonomic specificity that sound no different from something that Ekman would say (see Lazarus, 1991, pp. 77-78). It is thus quite clear that the Darwinian, Jamesian, and cognitive perspectives are already being integrated in the theories of students of emotion within each perspective. The odd perspective out here is, of course, the social constructivist.

There is, of course, already considerable overlap between the cognitive and social constructivist perspectives. This is exemplified in Ellsworth's (1994) attempt to reconcile evolutionary cognitive and social constructivist accounts of the cross-cultural similarities and differences in the dimensions underlying the appraisals for several emotions. The Darwinian and Jamesian perspectives seem to differ so fundamentally from the social constructivist in terms of their insistence that there are universal forms of emotional experience, expression and physiology. How can there possibly be any *rapprochement* among these perspectives?

The key to reconciling the Darwinian and Jamesian perspectives on the one hand and the social constructivist perspective on the other lies, I think, in a close examination of at what level of organization emotion is defined within each perspective. Borrowing a term from geography, it is clear that the definitions of emotion within each of the perspectives differ in terms of *scale* (Hudson, 1992). Emotion in the Darwinian perspective refers to sets of evolved adaptations that are instantiated in terms of specific behaviors, for example, fleeing, freezing, or screwing up the face into a scowl. Emotion in the Jamesian perspective is similarly defined in terms of very specific sets of physiological changes. The more or less successful attempt to demonstrate a correspondence between facial expressions and physiological changes is an indication that definitions of emotion within the two perspectives are similar in terms of the scale at which they are conceptualized. Smith's (1989) attempt to link appraisals with patterns of physiological change and facial expression and to thus vindicate Arnold's notion that appraisals reflect the way emotions are tendencies to act on the environment, reveals the similar scale at which emotions are defined within the cognitive perspective. Emotion within the social constructivist perspective, however, is defined quite differently. The scale of the definition is such that it encompasses the definitions offered by the other perspectives.

For social constructivists, emotions are acknowledged to consist of phenomena at the neuronal level, at the level of subsystems of the nervous system, at the level of specific cognitions, behaviors and classes of cognition and behavior, at the interpersonal level, and at the macro social and cultural levels. For them, however, emotions are best defined in terms of the more inclusive levels of organization or analysis.

4. EMOTION AND SPEECH

Why are these considerations important to students of emotion and speech, that is, to you? Even a cursory examination of the papers presented at this conference indicates that researchers who study speech and emotion are already participants in one or more of the theoretical perspectives and research traditions I have described. The studies by Tickle, by Burkhardt and Sendlmeier, by Amir, Ron and Laor, by Iriundo *et al.*, by Kienast and Sendlmeier, and by Schroeder, for example, all make reference to the Darwinian concept of basic or fundamental emotions, often by explicitly citing the Big Six. The studies by Amir, Ron and Laor, and by Kienast and Sendlmeier make use of the Jamesian assumption that emotions are distinguished at the level of the autonomic nervous system. The research presented by Batliner, Fischer, Huber, Spilker and Noeth and that by Cauldwell rest on the assumption within the cognitive perspective that emotions are dependent on how people appraise the environment. Douglas-Cowie, Cowie and Schroeder's call for an examination of the ecological validity of data upon which the study of emotion in speech is based and Cauldwell's analysis of the role of context in the perception of anger in speech reflect concerns dear to heart of many social constructivists.

I would argue that each of your research programs would benefit from a self-conscious attempt to place what you are doing within the context of the theoretical perspectives I have described. One of the major benefits of doing this would be an increased awareness of what kinds of theoretical and empirical "baggage" accompany the assumptions one is making. For example, if I am interested in the acoustical correlates of emotional speech and have chosen to study the Big Six emotions, anger, sadness, happiness, disgust, surprise, and anger, what can I assume about these emotions? From Darwinians such as Ekman, I can assume that there are universally recognized facial expressions that accompany these emotions. From Jamesians such as Levenson (and Ekman), I can assume that these facial expressions may also be accompanied by unique patterns of autonomic nervous system activity. From appraisal theorists such as Smith, I can assume that each of these emotions has its own corresponding unique pattern of appraisal.

I may also, however, come to appreciate the ways in which my understanding of these emotions may be limited by my assumptions and the assumptions of the research tradition of which my work is a part. Following the lead of Douglas-Cowie, Cowie and Schroeder, for example, I can begin to ask questions about whether the emotions I have chosen to study are really representative of "what's out there." Social constructivists have long advocated the study of non-standard emotions. In this regard, I might ask, How are hope, resentment, and envy prosodically represented in

everyday speech? I thus might be led, given a more complete appreciation of the scope of my assumptions, to examine a larger set of emotions. Alternatively, I might be content to study a smaller set of emotions but with a deeper understanding of their biological significance.

The final challenge, as I see it, is to consider what might happen to your understanding of the specifics of what you study if a more complete integration of the four theoretical perspectives ever comes about. How might your understanding of the prosody of anger change if episodes of anger came to be seen as serving both evolutionary/biological *and* social/political functions? How might attempts to develop more realistic emotionally expressive synthetic speech change if some emotions were seen as culturally-specific and others an universal?

As I am an outsider to the community of those who study emotion and speech, I hope that I have presented a too unrecognizable picture of what you do. If I have, I nevertheless hope that I have been able to convince you of the importance of considering the larger theoretical context within which you conduct your research and I thank you for giving me the opportunity for trying.

5. REFERENCES

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