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ON THEORIES ABOUT THE NATURE OF EMOTION

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Professor Salzen presents us with his theory of emotion. At the outset of his essay he tells us two things of importance for understanding what is to follow. First, he asks, "Why add another grand theory of emotion?" His answer is that "the very multiplicity of theories suggest that none has a central point of view or a deductive or generative principle that provides a satisfactory or complete explanation of the phenomena of emotion" (p. 47). We have some difficulty with such an assertion since multiplicity of theories do not, on scientific grounds, mean none are necessarily satisfactory. An understanding of the property of light requires at least *two* theories that happen to have the feature that if one is true, the other is not. Wave and particle theories of light both serve to explain features of phenomena, and physics does quite well with multiple explanation, even contradictory ones.

The second concern we have for his reason for "yet another theory" focuses on the idea that a theory of emotion is needed *which* offers a *complete explanation of the phenomenon* (emphasis added). Any complete theory of emotion requires that we have a complete and agreed upon idea as to what defines emotion. Salzen's first requirement for a theory of emotion is that it must deal with a different set of phenomena than earlier theories have. His theoretical construction, then, of what emotion is supposed to be is not based on empirical evidence, that is, what people have meant by "emotion" over the history of thought on the subject. In any case, since the belief that a definition of emotion is available that could be agreed upon appears on its face impossible. We wonder why indeed we need yet another theory.

Our concern here is made even more acute when Salzen stated that although he was aware of them, he would not state other theories which

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are "very well known . . . nor necessary to review." We would have rested more easily with such an idea if we did not happen to notice the dates of the references given. Even though Salzen states a preference for earlier theories, the mean date of theoretical references is 1958. In fact, only approximately 35% of all the references are later than 1980! While up-to-date references may not be necessary for fields of study that moved slowly, the study of emotion and emotional development, in the last dozen years, has exploded and any theory that neglects them does so at great peril. This is equally true if the claim for the need of such a new explanation is based upon the proposition that there exists no theory yet which explains the phenomenon.

But these comments may have more to do with style of writing than with content. On the positive side, it needs to be pointed out that Professor Salzen does attempt to organize the phenomena in such a way as to provide some framework for an over all theory. For example, we think he is correct in trying to disentangle emotional experience from what have been called emotional states (Lewis & Michalson, 1983) although he prefers to call them behavior and visceral changes, and we do think his attempt to place emotion into a social context is the right way to go (Campos, Campos, & Barnett, 1989; Emde, 1988; Lewis, 1992).

We are, however, at odds with his basic idea that he calls "thwarted action state signaling" (TASS). If we understand him correctly, positive emotions are changes from thwarted action states to unthwarted ones, while negative emotions are thwarted action states. What does such a concept of emotion imply? What we come up with is an old joke which asked "Why do you bang your head against the wall?" The answer is "it feels so good when I stop!" This seems to capture the idea that positives are the absence of negatives. Such a proposition does reflect an Eastern world view, which paraphrased is something like "pleasure is the avoidance of pain." While such a view might be supported, we think it flawed for several reasons since it requires that we postulate that love, joy, etc. (positive emotions) can occur only as unthwarted negative emotions. While our language differentiation appears more discrete for the negative side of the emotional ledger, to think such emotions as joy, humor, pleasure, love, and awe as only the result of anger, sadness, fear, and shame, etc. is to deny the existence of positive emotions and relegate them to nothing more than an epiphenomenon of negative ones.

If positive emotional states are simply avoidance of negative states, then the pleasures derived from eating, for example, should always cease when the negative state (an empty stomach) is eliminated. Appetites, however, seem to be felt when there is no longer any "need"; excessive pursuit of pleasure is hardly uncommon. This suggests that pleasure seeking is an entirely different system of motivation than pain avoidance.

Sexual pleasure is no better explained by the TASS model. While the period of arousal usually does end at male orgasm, it does not often at

female orgasm, nor must arousal end in orgasm to elicit pleasure and positive emotions.

Again, if we compare two pleasurable experiences and we say one is more pleasurable than the other, this does not mean that the less pleasurable is more painful. It is easy, in common human experience, to distinguish between pain and pleasure and even pain and pleasure motivated behavior. Salzen's claim that pleasure and pain are relative motivators belonging to the same class loses the ability to distinguish between two different sets of behavioral phenomena and sensations. Emotion is experienced and exhibited in many ways that a rigid theory cannot accommodate. For example, emotion stimulating events often produce both positive and negative emotions (Lewis & Michalson, 1983). The TASS model of thwarted action cannot easily account for this.

If the idea is to find a common evolutionary root for pleasure and pain, we must keep in mind that the simplest of organisms responds to various stimuli with both positive and negative tropisms.

There are, however, even more central reasons to question this view. The first has to do with existence of pleasure centers, both in terms of physiological systems incorporating endorphins and areas of the brain distinct from its pain centers. The second has to do with cognitive systems which seem to be constructed to seek pleasure, including recent studies of emotional behavior as it interfaces with cognitive achievement.

The idea that positive affects are derived from the absence or release of negative affects parallels many theories. For example, drive reduction theories of learning argued that learning took place when a drive (or need) was satisfied. A rat learned to make its way through a maze to food because eating reduced the drive of hunger. When Harlow demonstrated that monkeys could learn to open a latch to look out, drive reduction theorists claimed that there was a drive of "looking out" or exploration. Eventually, this idea of drive reduction ceased to be held, most likely because there were too many needs or drives and the absence of any of them was not possible to prove or disprove.

Moreover, other data from new sources arose which suggested that there might exist brain regions which themselves were associated with pleasure. Olds and Milner's (1954) demonstration that rats would press a bar to receive brain stimulation suggested that there were regions of the brain which felt good to stimulate. These "pleasure areas" support the idea that positive emotions have a location which may be distinct from the negative ones. Findings also point to different brain processes and areas as well as different autonomic nervous system processes associated with positive and negative emotions (Davidson, 1992; Levenson, 1992; Levenson, Ekman, & Freisen, 1990).

More recent data on endorphins also suggest that there exist specific brain areas and receptors designed to receive and process chemical events associated with pleasure and contentment. This is to be distinguished

from chemicals and their respective receptors that inhibit pain. These findings also point to "allocated" and specific regions and processes associated with positive emotions *independent* of negative emotions. Olds and Fobes (1981) identified pleasure centers concentrated in a large tract that ascends from the midbrain to the hypothalamus. Lesions in certain areas of the dermatoses affect discrimination of texture, form, size, angle, complex patterns, movement of object, movement of limbs, relative pressure, pleasure, and temperature as well as pain (Rosenzweig & Leiman, 1982). At the moment there are little data that support the idea that reduction of activity in negative emotion regions give rise to activity in the positive emotion regions. Most neuropathological maps of the brain include different areas for the various emotions (MacLean, 1970; Papez, 1937) and the separation occurs at lower levels than the cognitive.

For us, perhaps the most important source of doubt arises from the study of infant cognitive affective behavior during a learning task. In a series of studies, M. Lewis and his associates (Alessandri, Sullivan, & Lewis, 1990; Lewis, Alessandri, & Sullivan, 1990) have observed the affective expression of infants 2- to 8-months of age as they learn a simple task. Attached to their wrist was a string that, when pulled, turned on a slide and music for 2 sec. The armpull data indicate that after an initial base period, infants' armpull rate increases significantly and reached a learning criterion of $2\frac{1}{2}$ times base rate within 3-5 min. What is particularly interesting is the accompanying affective expression. Infants show *interest* faces as they initially experience the outcome as a function of their arm pull. Once past the initial experience, and as they appear to learn the connection between movement and features, they show a *surprise* expression. This appears to correspond to the "aha" or discovery phenomenon. Immediately following this, and as their armpull rate begins to increase significantly, is the *joy* expression associated with mastery. This positive expression of *joy* does not occur if infants cannot learn the connection between the arm pull and the picture/music outcome.

If at the point of learning (arm pull and joy expression) we suddenly alter the condition and introduce an extinction phase—the arm pull does not result in picture/music outcome—armpull rate increases dramatically, *joy* expressions disappear and *anger* and/or *sadness* appears. If, after 2 min, we give them control of the picture/music again, armpull rate returns to previous learning levels ($2\frac{1}{2}$ time base), *anger* and/or *sadness* disappear and *joy* reappears. The appearances of the positive emotion of *joy* and the negative emotion of *anger* and/or *sadness* are not related. The initial positive emotion was not preceded by or related to the negative one!

While there is much more to Professor Salzen's theory of emotions, the basic assumption of TASS makes this a highly limited and restricted account of emotions. It attempts to reduce emotions to a psychobiological model that does not fit much known data about emotion. "The logical

point is that from the fact that the behavior of a system can be *deduced* from its description . . . , it does not follow that it can be *explained* from that description" (Putnam, 1973). It certainly does not tell us much about emotional development. The task Salzen has set is an important one; nevertheless, no comprehensive theory of emotion yet exists that such a topic deserves. In the meantime, there remains much empirical work to be done.

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