

WHAT FUNCTIONAL ANALYSIS CAN OFFER TO THE STUDY OF EMOTIONS AND THEIR DEVELOPMENT

LO QUE EL ANÁLISIS FUNCIONAL PUEDE OFRECERLE AL ESTUDIO
DE LAS EMOCIONES Y A SU DESARROLLO

WENDY E. ROTH AND JACOB L. GEWIRTZ¹
FLORIDA INTERNATIONAL UNIVERSITY

ABSTRACT

Regardless of a researcher's theoretical orientation, emotions can be inferred only from behavior in context. While traditional theories of emotion often characterize emotions as organizers or motivators of human behavior and propose that environment plays an explicit role in emotional responding, the role of environmental events in determining emotional expression rarely has been systematically considered in such approaches. The thesis advanced in this paper addresses how a functional approach to the study of emotions can contribute to our understanding of emotions and their development and the role of environment in their expression.

Key words: emotions, behavior analysis, human development

RESUMEN

Independientemente de la orientación teórica que adopte el investigador, las emociones se pueden inferir únicamente a partir de la conducta y su contexto. Mientras que las teorías tradicionales sobre la emoción a menudo caracterizan las emociones como organizadores o motivadores de la conducta humana y proponen que el entorno desempeña un papel explícito en las respuestas emocionales, el papel de los eventos del entorno raramente ha sido considerado en forma sistemática. La tesis de este artículo es que un enfoque funcional del estudio de las emociones puede contribuir a una mejor comprensión de éstas y de su desarrollo y puede ayudarnos a entender el papel que desempeñan los eventos del entorno.

¹ Authors' Corresponding Address: Department of Psychology, Florida International University, Miami, FL 33199. Email: wroth01@solix.fiu.edu

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One of the earliest scientific inquiries on emotion, rather emotional expression, is found in Darwin's *The Expression of the Emotions in Man and Animals* (1872). Darwin's interest in the role of emotional expression in the evolution of species resulted in a taxonomy of emotions that would still serve as *the* template for the classification of emotions more than a century later. Darwin's taxonomy also catalogued what he believed to be the prominent "motor apparatus" associated with particular emotional expressions (e.g., blood vessels are the motor apparatus for blushing which, in turn, can index modesty or shame). Later in that same century, physiological events would become the central focus in one of the earliest psychological approaches to emotional states.

It was William James (1890/1950) who equated the perception of bodily changes to emotion itself (e.g., we feel sorry because we cry), a perspective that subsequently became known as the James-Lange theory during the 1920's, and one that was debated vehemently by Cannon and Bard. Cannon and Bard argued instead that brain activity produces both the experience of emotion and concomitant bodily arousal. Both the scientific controversy over what is an emotion, which began more than 70 years ago, as well as the taxonomic approach to their study set more than a century ago, are evident in most of the current research on emotions. Despite the advances made in the study of emotion and its expression, the causes and correlates of emotion remain a mystery, and given the lack of research on the context of emotional responding, the environmental contributions to emotional behavior remain poorly understood.

The role of environment in emotional expression has been addressed only nominally in most theories of emotions (e.g., Barrett & Campos, 1987; Calkins, 1994; Campos, Mumme, Kermoian, & Campos, 1994; Case, Hayward, Lewis, & Hurst, 1988; Fisher, Shaver, & Carnochan, 1990; Kagan, 1994; Izard, 1991, 1993b; Ekman, 1994; Lazarus, 1991; Thompson, 1994). Moreover, examination of environmental determinants and correlates of expressive behaviors denoting emotion has been neglected consistently in this literature. Instead, much of the attention in this area has been devoted to isolating various cognitive, physiological, and neurochemical indices that discriminate between different emotions.

Some theoretical approaches have tended to define emotions/emotional behavior in terms of concomitant physiological, cognitive and/or overt behavioral states, for the most part ignoring their environmental determinants or correlates (e.g., Barrett & Campos, 1987; Bridges, 1932/1962; Burlingham,

1952; Campos & Barrett, 1984; Case et al., 1988; Clanton & Smith, 1977; Fischer et al., 1989, 1990; Foster, 1927; Freud, 1909/1949; Gesell, 1906; Izard, 1992; Lazarus, 1991; Levy, 1936; Masciuch, 1988; Masciuch & Kienapple, 1993; Plutchik, 1962; Ramamurti, Devi, & Hymavathi, 1985; Robey, Cohen, & Epstein, 1988; Ross, 1930; Schacter & Singer, 1962; Sewall, 1930). In contrast, others have focused their research not on emotion per se, but on global patterns of social interaction, which sometimes are said to involve affective states (e.g., Clark & Dickman, 1984; Dunn & Kendrick, 1980, 1981, 1982; Jacobs & Moss, 1976; Kendrick & Dunn, 1980, 1982; Hupka, 1984; Lamb, 1978; Teti & Ablard, 1989; Vandell & Wilson, 1987; Volling & Belsky, 1992). That is, while some researchers have hesitated to emphasize affect-laden terms in their analyses, those same reports also could be considered studies of emotional behavior. For example, the series of reports by Dunn and colleagues (e.g., Dunn & Kendrick, 1980, 1981, 1982) on how the birth of a new sibling changes both the quality and quantity of mother-firstborn interactions may be interpreted as representing a series of studies on jealousy/sibling rivalry.

Across literatures, attempts have been made to classify overt patterns of behavior taken to denote emotions according to the topographies of such patterns, as well as to identify how topographies of emotional expression may vary developmentally. While identifying progressive, orderly developmental changes in how emotion is manifest at different developmental points could have utility, from a behavior-analytic standpoint, description of these patterns across life-span segments does little to account for environmental determinants that may contribute to the stability and change in such patterns over time. Following this logic, behaviors denoting emotion/emotional expression at any developmental point more likely would be determined by their consequences than simply by their structure or topography alone (Rosales-Ruiz & Baer, 1996). What is central to such a focus then are the conditions under which emotion-denoting behaviors enter into functional relationships with environmental stimuli that control when, where, and how these behaviors occur. In this framework, a simultaneous focus is required on the expressive response elements that are said to denote emotion *and* the environmental events that determine them.

Structural Approaches to Emotions

One problem that confronts researchers of emotions is how to define them. While lay persons appear to have little difficulty recognizing and describing emotions (Keller & Schoenfeld, 1950, Skinner, 1953), scientific definitions of emotions vary according to which particular patterns of behavior are said to index particular emotional phenomena. Some researchers have used

the topographical characteristics of emotional expressions from infancy onward to outline an epigenetic unfolding of particular emotions as indexed by changes in how they are overtly expressed (e.g., Mascuich, 1988). Often, jealousy is characterized within theoretical frameworks of emotion that emphasize an epigenetic unfolding of "complex" emotions either in a differential, discrete, dimensional, or essentialist fashion (e.g., Ekman, 1994; Izard, 1992) or according to cognitive properties, predominantly from a functionalist viewpoint (e.g., Campos & Barrett; 1984; Case et al., 1988; Fisher et al., 1989; Lazarus, 1991; Masciuch & Kienapple, 1993).

Theorists who subscribe to the essentialist tradition emphasize that there are several unique and universal emotions present at birth. Other discrete, yet more complex emotions, like jealousy, are prewired to emerge as maturational processes develop and refine neural and cognitive substrates (Izard, 1993a). In contrast, more cognitively-oriented functionalists (e.g., Barrett & Campos, 1987; Campos & Barrett, 1984; Lazarus, 1991) allow for congenital innate/universal emotions. However, their attention centers on how cognitive and/or motivational processes coalesce and interact to organize more complex emotions.

Independently of the manner in which epistemic values govern how emotional constructs are defined and linked to empirical realities (Kagan, 1978), most theories posit affect-based structural properties for non-congenital, seemingly complex emotions. That is, regardless of the classification strategy within and between theories of emotion, non-congenital emotions often have been considered to be a blend, mixture, or mapping of two or more elementary emotional phenomena. For example, in the case of jealousy, Fischer et al. (1989, 1990) have maintained that it is a subordinate emotion to those endowed from birth and that structurally jealousy reflects a combination of the basic emotions of anger, love, and fear. In contrast, Lazarus (1991) has advanced the notion that jealousy is molded by anger and resentment. Whether or not one includes changes in cognitive processes and physiological events with these descriptive accounts of the nature of jealousy once it emerges, under both of these types of theories it remains unclear how any of the various response dimensions become part of the emotional complex called jealousy. While these and other similar approaches may do well in providing structural descriptions of jealousy and other emotions, and description can proceed in the absence of explanation (Rosales-Ruiz & Baer, 1996), a functional approach demands identifying the functional relations involving the environmental events that account for behaviors said to denote the various emotions.

A Functional Approach to Emotions

As mentioned earlier, several literatures have furnished normative descriptions of various emotions in infants and children at the observable-expressive level, often emphasizing structurally-oriented definitions. From the behavioral perspective, there are at least two ways in which these approaches can impede understanding of how emotional behaviors are manifest in infants and young children, as well as older children and adults. First, a focus on normative patterns of behavior may not reflect the idiosyncratic patterns of emotional expression at the level of the individual. Second, such strategies can lead researchers to overlook the relevant environment-behavior relations that come to control emotional behavior. The functional approach emphasized here can help clarify the function of environment with respect to emotions without appealing to the mentalistic events typically suggested by other interpretations of the "function" of emotions (e.g., coping mechanisms for Lazarus, 1991 or action tendencies for Campos et al, 1994).

The functional approach is similar, but not symmetrical with those suggested by other researchers (e.g., Barrett & Campos, 1987; Campos et al, 1994; Fischer et al, 1989; Izard, 1993a) who have employed the term "functional" when referring to the function of emotions. The primary distinction between these usages is that the term "function" refers to the antecedent-behavior-consequence relations that serve as the basis for shaping and maintaining emotion-denoting behaviors. In contrast, others who have suggested a functional approach to emotions employ the term "functional" in the sense emotions serve as teleological constructs which program internal, behavioral, and social regulatory effects. They have viewed emotions as intrinsic, goal-directing guides to relevant behavior; and for any given emotion or family of emotions, they suggest that unique but flexible motor programs impel action to serve various regulatory functions. It seems that function in their usage refers to ways in which emotional behavior subsequently affects environment, rather than to how the environment determines emotional behavior. A behavior-analytic approach emphasizes analyzing the environmental events that operate on emotion-denoting behavior.

Antecedent conditions and contingent responsiveness of the social environment both have been implied to be relevant to emotional expression in various researches, as in the attachment literature (see Gewirtz & Peláez-Nogueras, 1987, 1991), where such environmental factors have been manipulated and systematically studied. The argument made by behavior analysts interested in development is to move beyond considering the environment as a *gross* concept (Gewirtz & Peláez-Nogueras, 1996) and to move beyond using the term "social environment" and metaphors like

"attachment" as gross indexes for the presence of people and their behavior patterns that affect the "emotional" behavior of others. Environmental events must function, or be shown to potentially function, to affect behavior to qualify for consideration as determining factors for behavior (Gewirtz, 1978). Thus, it is not constructive to operationalize behavior patterns said to denote emotion in terms of responses alone; they must be co-defined by their nonsocial and social determinants. Further, it is not sufficient to assert environment-behavior relationships; they must be demonstrated. In this way, researchers who employ the functional approach found in behavior analysis are in an ideal position to illustrate the role of environment in emotional responding.

When followed, the logic outlined herein can preclude theorists and researchers becoming entrapped in the reification of emotions, and in losing sight of either the behaviors and or the controlling conditions involved in their expression. That is, a behavior-analytic approach summarizes the stimulus-response relations that denote that emotional behavior, not simply the responses alone. It accomplishes this by maintaining the emphasis that the terms employed to denote various emotions are nothing more than adjectives that describe a behaving organism in relationship to its environment rather than by operating as if they were the property of an organism enclosed in a world of self-significance (Campos et al., 1994). Of course, from a behavior-analytic viewpoint, the functional approach argued for here obviates the need to employ the term "emotion" or even more specific terms that denote particular emotions. However, it is recalled that Skinner (1953) did not imply that such labels lack utility. Rather, he suggested that their utility lies in their convenience as summary terms to describe circumstances that affect the probability of patterns of responding. Skinner maintained that labels employed to denote emotions often describe idiosyncratic patterns of responding, but that these labels lack explanatory power to the extent that they fail to identify the proximal mechanisms that produce these response patterns.

One can question the use of descriptive terms that differentiate between types of social-contextual variables to further subcategorize different "types" or families of emotions, insofar as they may not serve any further heuristic purpose. For instance, jealousy in the presence of a sibling is termed "sibling rivalry" while jealousy between lovers is termed "romantic jealousy." When functionally defined, these semantic distinctions may be lost. Notwithstanding this fact, for practical and communicative purposes such distinctions can index details that add to or refine the global picture of the total behavior-environment circumstance (Skinner, 1953). While the identity of the combinations of expressive states underlying various forms of emotional behavior could enrich our understanding of the variety of ways humans display emotion, we must still identify the proximal causes that give rise to these phenomena. And, as

Skinner (1993) and Millenson (1967) have noted, there still remains the task of identifying the conditions under which such labels are evoked in speaker behavior.

Advantages of the Functional Approach to Emotions

Emotion-oriented research programs often have neglected to examine the influence of environmental stimuli on emotional responding. At the same time, the functional approach offered by behavior analysis has attended to environment-behavior relations, but often has avoided investigating the functional relations that may account for the patterns of behavior said to denote each emotion/emotional behavior class. An obvious exception to this, however, is the attention that behavior analysis has paid to anxieties and phobias, beginning with Watson's and Rayner's (1920) research with little Albert. The advantages of a functional approach to the study of behaviors said to denote emotion have been noted, as has the fact that such an approach may prove useful in preserving the integrity of the environment-behavior relationships intrinsic to such patterns of behavior. Implicit in the argument is that expressive behaviors denoting emotions often appear to involve operant behavior that can be occasioned, shaped, and maintained by environmental conditions. While research has shown, for example, that overt emotion-denoting behavior conforms to the definition of operant behavior (e.g., jealousy in infants; Roth, Gewirtz, & Markham, in press), it is quite likely that less readily-observable behaviors can occur concomitantly with, or in the absence of, public expressions of behavior denoting emotion. These concomitant behaviors may function as respondents and, as behaviors, they, too, require analytic investigation. Yet, independently of whether emotional behavior occurs publicly or privately, the controlling relations between environmental factors and behaviors denoting emotions must be accounted for. Thus, since to date there has been little or no attempt to do so by most research programs whose topical interests are emotions, one purpose of this paper has been to suggest that behavior analysis is in an ideal position to demonstrate how environmental phenomena can program the occurrence of emotional behavior.

It should be clear that a functional approach to the study of emotions/emotional behavior, as pioneered by behavior analysis, has much to contribute toward understanding and explaining how environment factors can result in the expression of such seemingly-complex behavior. Many questions can be raised with respect to the formative roles of discriminative stimuli, setting events, reinforcement contingencies, establishing operations, and generalization in both the establishment and maintenance of functional response classes that denote emotions. In contrast to some other approaches

that have asserted that the environment can program the expression of emotions, the strategies suggested under a behavioral logic allow for answers to questions about the role of environment in the expression of emotions to remain as facts to be determined rather than as assertions theoretically imposed (Rosales-Ruiz & Baer, 1996). Insofar as behavior analysis has an established methodology designed to isolate the environmental determinants of overt behavior at the level of the individual, this same technology can be used to specify how the environmental processes similarly operate on behaviors that may occur at a less-readily observable level (e.g., psychophysiological behaviors).

Panksepp (1994) has cautioned that attention away from the epigenetic unfolding of neurobiological process involved in emotional development may minimize the importance of these processes, and preclude a complete understanding of emotional phenomena. However, attention to such neurobiological processes in the absence of attention to the role of environment will fail likewise to enhance our understanding of emotional development in humans. The inherent and highly-adaptive social nature of the human species demands that socio-environmental variables be included in any investigation of emotional development. Clearly, apart from behavior analysis, in recent years research interests have turned more toward the nature side of the *nature-nurture* dichotomy, particularly in developmental psychology (see Midgley & Morris, this issue). As evidenced by suggestions such as Panksepp's (1994), they appear to argue more for a nature-based interpretation of emotional development than for an openness to the range of emotional-outcome possibilities inherent in the interaction between nature and nurture. An extreme focus on one aspect, rather than on the interaction between them, can inhibit our understanding of emotional phenomena.

The stimulus conditions that can elicit or evoke emotional behavior can change in the course of development, with some new stimuli gaining control over behavior and other, established stimuli, losing their control. The changes on the environment side of the emotional development equation can inform us on the acquisition of new forms of emotional expression and the loss of others (Rothbart, 1994). Thus, what a functionally-oriented research strategy can provide is theoretical uniformity for understanding emotional behavior in infants and its continuity or discontinuity across the lifespan (Schlinger, 1995).

As a theoretical approach for understanding emotional behaviors, a functional approach as in behavior analysis can (a) organize the approach to emotions in a developmental frame, (b) be parsimonious in accounting for those behaviors (overtly observable or not), (c) advance testable hypotheses, and (d) provides a methodology that can ensure both high internal and external validity. Moreover, its logic is grounded in empirical fact that can be and has been

extended to a wide range of behaviors and conditions which give rise to them. Thus, as a means for contributing to understanding the ontogeny of various emotions/emotional behaviors in infancy and beyond, a functional approach can provide more than a trivial account of emotional behavior and its development. Further, because behavior analysis is known for its rigorous methodology, despite that it chooses to forego conventional group statistical procedures to validate its hypotheses, researchers who study emotional behaviors from different theoretical orientations can borrow features from this methodology to improve their own understanding of this phenomenon. Researchers in other areas have done so with great success (e.g., Rovee-Collier and colleagues have employed operant techniques in the study of infant memory).

CONCLUSIONS

A functional approach has much to contribute to the study of emotions and their development from both theoretical and methodological standpoints. Further, it can serve to buttress against an overemphasis on the nativistic aspects of emotions focused on by many theoretical perspectives. That is, a functional approach can specify the role that environment is said to have but is never examined in these other approaches. Indeed, it would be challenging for any researcher who, given a picture of an infant's face, an EEG printout, or a radioimmune assay of salivary cortisol, or even all three pieces of information, to identify jealousy, anger, or fear as the emotion summarized by these data.

What also would be needed to recognize the behaviors represented by such data as indexes of any given emotion, are the details about the environmental milieu from which those data are obtained. To understand the conditions that control the expression of any such emotion in any given context, those researchers would need information on the patterning of environmental events that affect the probability of such patterns of responding. The most important contribution that a functional approach can offer to the study of emotion is its insistence on specifying the environmental conditions that are associated with them. That is, what a functional analysis is in the best position to offer the study of emotions is the contribution of the environmental factors in their expression.

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