

## Rejoinder to comments on 'Effector patterns of basic efflotions'

**Susana Bloch**

*Institut des Neurosciences, CNRS, Université Pierre et Marie Curie, 4, Place Jussieu,  
75230 Paris Cédex 05, France*

Our article being essentially interdisciplinary, I will briefly reply to some of the interesting comments which appear to be centered around a three-fold sphere of interest: neurophysiological (brain function), psychological (emotion as a system of communication) and theatrical (training actors in emotional expression).

The comment of Wolf Singer places our research within a broad framework of modern views about brain organization. i.e. a brain functioning as a distributed rather than a hierarchical system. He considers that our work demonstrates that, 'central states of the brain can be altered by a selective modification of output patterns'. In this sense, one could say that our data give experimental support to the old James-Lange theory.

Paul Eckman's partial disagreement with us is probably the consequence of a different conceptual approach to the study of emotions. We define emotions as functional states of the organism comprising physiological, expressive and subjective components. These components can be dissociated, but they generally go together. We believe that the effector patterns we have describes for the basic emotions do not essentially differ in 'normal' or in 'pathological' conditions. except in intensity and/or duration. For example, while crying can be considered as a *phasic* reaction to a sad 'emotogenic' internal or external situation, depression may be the result of a *tonic* state of sadness. On the other hand, we are taking basic human emotions in a Darwinian evolutionary and adaptive sense, so that along with the classically accepted basic emotions of joy, sadness, anger and fear, we have included tenderness (parental behavior, friendship, filial behavior) and eroticism (sexual behavior). Psychoanalysts (Lebovici's comment) and ethologists certainly also consider them as basic emotions. In any case, these issues are too controversial to be dealt with in such a brief rejoinder. With respect to facial movements, we have not describes the muscular actions involved in each of the emotional effector patterns, this having been done very thoroughly by Eckman himself. A clarification about training our actors: while the reproduction of the facial expression is mastered in a short time, the perfect reproduction of the complete effector patterns and the quick switch from one to another, however, require systematic training. With respect to the relation between respiratory movements and the concomitant facial expression, this is an issue that needs to be experimentally demonstrated. In our experience, the initiation of the specific breathing pattern clearly facilitates the corresponding subjective experience and enhances the expressive component. in addition, the breathing component of the effector pattern facilitates the immediate recognition of

the emotion by a naive observer, who cannot distinguish the correct pattern reproduction from a 'real-life' emotion (unpublished observations). One could say in a figurative sense that breathing 'gives life' to the emotional expression. The breathing pattern therefore appears as the foundation stone of the emotional differentiation and probably adds to our natural, maybe 'built-in' ability for affective lying, in the sense given in Ross Buck's comment.

The training system we have developed has so far worked out successfully with young drama students of different nationalities within our Western culture: Chilean, Brazilian, Scandinavian, Spanish and French. To answer Robert Lanchester's objections, a practical workshop using our method would have to be worked out with his American actors. Of course, we agree that shedding tears does not necessarily evoke sadness in an audience, but he must agree with us that an actor who knows what happens in his body during sadness and who can use at will the exact behavior needed to initiate the sad reaction without having necessarily to appeal to personal painful images, cannot but add to, and in no case subtract from, his creative ability and artistic display. The long experience Horacio Muñoz has in applying our work with theater students as well as with professional actors shows the practicability of these psychophysiological findings. It may well be that there has been an over-use of purely psychological introspection in the actor's work with emotions (Jean-Marie Pradier's comment).

Both Robert Lanchester and Ross Buck question whether the success of our method is not simply the result of a general non-specific, placebo-like effect. The main point of our system is precisely that clearly differentiated physiological and expressive states are *intentionally* produced, and that *specific* subjective experiences can be aroused by the correct reproduction of *specific* emotional effector patterns. Non-specific factors such as general body control and relaxation certainly contribute, and our preparatory exercises [*Journal of Social and Biological Structures* (1987) 10, 1-19, pp. 7-8] are expressly 'designed to provide the-necessary baseline conditions for the actual training of the effector patterns proper.

Frederick Turner relates our work to a formal version of very ancient artistic and religious trainings. It comes from ancient knowledge that internal affective states in Turner's terms (subjectivity, in ours) can be created by conscious intention through specific techniques, and modern neurophysiological concepts about brain function are beginning to explain such effects (Singer's comment).

With respect to physiological components defining acting parameters of such complex phenomena as presence (comment by Pradier), this goes largely beyond the scope of our study. In any case, presence has more to do with being than with acting and certainly does not correspond to a basic emotion.

We believe that our procedure, allowing the induction of an emotional experience by peripheral feedback as well as the possibility of an instantaneous 'step-out' of the emotional state, again by a controlled action upon the periphery, not only defines a powerful method for the expression of emotions in actors but also constitutes a 'noninvasive' model for the study of emotions as such without the need of using strong emotogenic external; or internal (imagery) stimuli.

This research is in progress and we are grateful for the comments expressed about our article, as they open new perspectives and encourage further development of this interdisciplinary venture.