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Reproducing emotion-specific effector patterns : a bottom-up method for inducing emotions (ALBA Emoting®)

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One of the practical as well as ethical problems scientists are confronted with when investigating emotions is how to produce them in the laboratory. With classical procedures, such as presenting visual material containing strong emotional valence (e.g. Buck et al., 1974; Wagner et al., 1986) or instructing subjects to recall or imagine particular emotional events (e.g. Schwartz, et al., 1981; Friedlund et al., 1984), it is often difficult to determine what emotion is being evoked, whether it is pure or blended, and if present, when it begins and ends (Levenson et al., 1990). We here report an essentially different psychophysiological procedure for inducing emotions, based on the reproduction of precise, objective prototypical action patterns, which will activate and deactivate specific emotional systems.

Emotional effector patterns and general procedure for reproduction

In previous studies, we extracted from a complex ensemble of physiological reactions occurring during an emotion, the specific respiratory-facial-postural patterns associated with six basic emotions: *joy-laughter*, *sadness-crying*, *anger-aggression*, *fear-anxiety*, *erotic love*, and *tenderness*. We called these patterns, "emotional effector patterns" (Bloch & Santibáñez, 1973; Bloch et al., 1987). Since breathing, postural attitudes and facial expressions can be altered at will, it occurred to us to see what happened if naive subjects were taught to reproduce them, without being informed of the associated emotion. We found that if subjects reproduce the prototypical patterns correctly, images, personal memories as well as related feelings may arouse in the performer, and the corresponding emotional message is vividly transmitted to an observer. If then a return to normal breathing and neutral posture is instructed ("step-out" technique, essential to avoid what SB has called "emotional hangover"), the subject may immediately come back to a non-emotional neutral state. In some cases, especially during the first trials, the subjective arousal may work so well that a "critical mass" of feedback effectation can be rapidly attained, in which case the feeling follows its natural flow (Santibáñez & Bloch, 1986). With training, i.e. by a systematic repetition of the "step-in/step-out" procedure, it is possible to alter the time course of the subjective arousal and control it at will. Such a state of affairs is useful for producing well controlled emotional episodes such as are required in the laboratory or on the stage (Bloch et al., 1972, 1987; Bloch & Lemeignan, 1992, Bloch, 1992, 1993). The structured method for inducing specific emotions which developed from these findings, is called ALBA Emoting® (Bloch 1993).

We briefly present here the prototypical breathing patterns of each basic emotion (fig 1) ¹

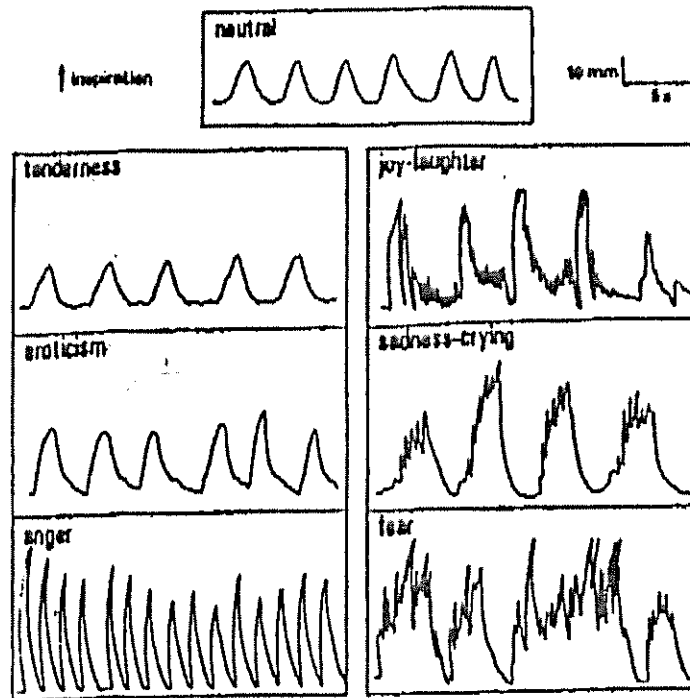


Fig.1: Recordings of prototypical breathing patterns for each basic emotion.

A systematic study done over a large number of subjects has shown that these respiratory patterns not only differentiate qualitatively among the 6 emotions but quantitatively as well (Bloch et al. 1991). The instructions to reproduce them are given in simple terms, as for example "... inhale sharply through the nose and exhale through the mouth in rapid saccades" (for joy-laughter); "...breathe through the open mouth in a rather deep but fast rhythm" (for eroticism) or "...breathe sharply in and out through the nose" (for anger). What normally occurs is that the adequate facial expressions as well as the appropriate muscular tensions, appear by themselves. If they do not, and/or if the body posture is not correctly adopted, further instructions are given such as "... stretch your lips horizontally drawing the corners up and back, showing the teeth; keep your eyes semi-closed, the body very relaxed, the head loosely hanging backwards .." (for joy); "... keep your body very relaxed, tilt your head backwards and to the side, exposing your neck; move your hips slowly .." (for erotic), or "... tighten your lips and contract the lower jaw; focus your eyes, with tense lids; put tension in the body and incline it slightly forward" (for anger). Each element of the patterns is very precise and important, the induction rarely taking place if an element is missing or misplaced. The subject continues to execute the instructed pattern, in a strictly "robotic" manner for several seconds. But, gradually, the mechanic movements give way to an equally regular but more natural output, finally attaining a very natural looking configuration, often accompanied by spontaneous vocalizations, laughter, or tears, depending on the targeted emotion. When questioned later, not only the subject can name the emotion that had been induced, but a naive observer can name it as well. A recognition study of the reproduced patterns presented in video-clips to non-

¹ The facial and postural characteristics are reported elsewhere (Bloch & Lemeignan, 1992)

adverted observers, showed that the emotional message was unequivocally transmitted, since the emotion of each reproduction was correctly identified (Lemeignan et al., 1992).

Experimental procedure

In this report we present a systematic analysis of the subjective activation during pattern reproduction in an intra-subject laboratory study, which confirms the more circumstantial observations obtained before with a larger group of subjects both in laboratory as well as in workshop conditions (Bloch, 1989, 1992)

Two naive subjects, one female (subject A) and one male (subject B) were instructed to reproduce each of the 6 described emotional effector patterns. Recording of physiological parameters (respiratory movements, heart rate, skin conductance, skin temperature, muscle activity, which are not reported here (see Lemeignan et al., 1990 and Bloch et al., 1991) as well as the expressive output (video film), were simultaneously registered. In order to avoid as much as possible external interferences and specially inadvertent interactions with the experimenters, the subject was isolated in a separate room, watched through a video monitor and guided by an intercom. system. The experimental procedure was as follows: after external electrodes were placed for the physiological recordings, the subject was asked to be as calm and relaxed as possible, to keep an even, slow breathing rhythm and a neutral facial expression. Once baseline recording conditions were attained, instructions for a pattern reproduction were given in random order, without naming the associated emotion. The reproduction always started with very technical breathing instructions, the facial and postural components usually following naturally, though sometimes they required further coaching². The reproduction was continued for a period ranging between 1 and 1.5 minutes, and was ended by a "step-out" procedure which consisted in asking the subject to stop the exercise, to give at least three deep breaths, to change posture and to touch the face gently. At the end of each trial, the subject had to evaluate by notating from 1 to 5 (signaling with the fingers so as to not disrupt the respiratory recordings) how s/he judged the intensity of the subjective experience related to each of the six emotional patterns, which were called out by the experimenter with a neutral voice, one after the other in random order. The experimenters also gave independently a notation from, 1-5 judging from poor to good the precision of the executed patterns. Once these notations were given, the subjects could express freely what they had experienced. Ten sessions were performed for subject A and eleven for subject B.

Results

Results show that most of the time both subjects had a subjective experience related to the target emotion. This is expressed quantitatively by the self-ratings and by the detailed content analysis of the free reports. Average self-

² In the free-moving conditions prevailing in a workshop, this coaching is easier. In the laboratory situation the subject is sitting on a high chair, has wires attached for recording physiological parameters, and is instructed to move as little as possible, so as to avoid recording artefacts.

ratings along with the average expert scores throughout the experimental sessions are shown in figure 2.

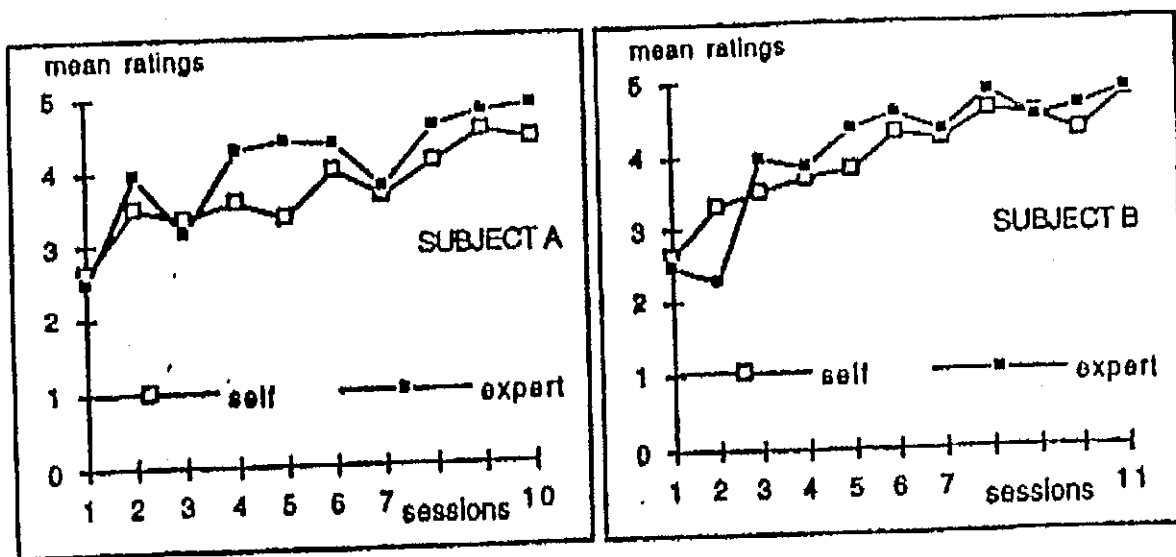


Fig. 2: Mean self-ratings (all emotions pooled) and mean expert-ratings along the sessions.

One can see that self-ratings evolve in parallel with expert-ratings, showing that the specific subjective activation becomes clearer and more precise as the target-emotion effector patterns are better reproduced³.

The percent of reproductions leading to a target-emotion subjective activation, as analyzed by a rigorous dissection of the subject's free comments, is shown in Figure 3. This was done by taking down all words or sentences which

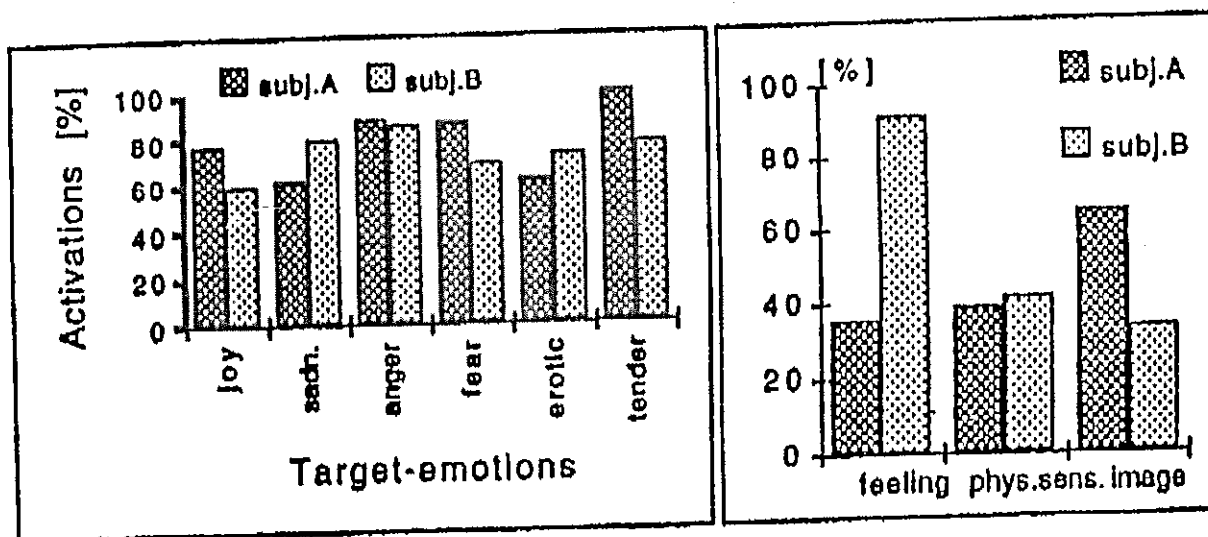


Fig. 3: Mean subjective activations over sessions.

Fig. 4: Percent subjective activation per category (all emotions pooled)

³ The quality of the pattern reproduction was evaluated independently by each of the three experimenters from the respiratory recordings and from the expressive outputs as seen in the video. A high correlation was found among the three ($r > .92$), showing that the criteria for evaluating the presence and quality of the prototypical patterns are objective.

expressed a change from the pre-reproduction subjective state in the direction of the target emotion⁴. One can see that the ratio for which this occurred is always above 60%. The nature of the reported subjective activations could be classified into three main categories: 1) arousal of actual feelings; 2) physical sensations or desire for action and 3) memories or mental images of real or imagined situations. In many cases comments concerned more than one category. The proportion of activations within each category are shown in figure 4. As can be seen, both subjects always had some physical sensations, probably due to the muscular tension involved in some of the patterns and/or the breathing patterns involving hyperventilation (e.g. anger and laughter) which at the beginning could provoke some dizziness. Interestingly however while subject A had significantly more images and less feelings, the reverse was the case for subject B. It is as if the fact of visualizing a situation, real or imagined, reduces the actual feeling and vice-versa.

Results confirm experimentally that the correct reproduction of specific emotional effector patterns arouses in the performer the corresponding subjective experience. Moreover, the intensity of the subjective arousal, according to the subject's report is correlated with the quality and precision in reproducing the correct respiratory patterns as well as the clarity in the facial and postural expressions. Notwithstanding, and especially during the first 2 or 3 sessions, the subjects also report having experienced other feelings, but with much less intensity and clearness. These, which we call "parasite" emotions, tend to disappear as the subjects go along the sessions. Obviously a learning element is introduced, and we have frequently observed that this process can help people to clear out mixed or confused emotions and have a better insight of what they are really feeling. For instance subject B, by the end of the experiment, spontaneously reported to have improved in his clarity for expressing and perceiving his own emotions.

Conclusions

The present results confirm previous informal observations in the sense that the reproduction of an emotional effector pattern activates the ensemble of the corresponding emotional system, including the subjective level. The possibility to induce emotional states and to control them by specific voluntary actions appears as a reliable "bottom-up" method for inducing emotions, and demonstrates experimentally that central states of the brain can be triggered by the selective manipulation of output patterns. The entire procedure has powerful applications in psychotherapy, communication and in acting (Bloch et al., 1972; Bloch 1993). However, as it implies the manipulation of respiratory rhythms, it is highly recommended not to learn it without expert guidance.

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⁴ Not all comments however were exploitable, either because they were incomplete, confused or simply non-existent. We are aware of the difficulties and limits in analysing a free subjective discourse (Johnson-Laird & Oatley, 1989).

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