

Listen to my breath: how does it sound like? Breathe with me: does it improve emotional attunement?

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Introduction: Several psycho-physiological studies provided evidences on the influence of psychological variables (such as cognitive processes, performance management and emotional experience) on respiration. Anyway, previous investigations relied most of all on physiological measurements. We argue that also the investigation of the expressive role of breath sounds could be relevant from a psychological point of view since they could have a role in emotional expression and emotional attunement. Previous studies that have addressed the relation between emotions and respirations provided evidences for quite distinct respiratory patterns associated to specific basic emotions (Boiten et al, 1994; Boiten, 1998; Philippot et al, 2002) and, what's more, that mimicking such patterns induce correspondent emotional feeling state (Philippot et al, 2002). This technique is used in some counselling and therapeutic context to reinforce rapport (Bandler et Grinder, 1975; Sutton, 2002; Siegel, 1984) but few investigations have addressed this issue. If “breathing together” could truly enhance emotional responding, that could provide significant cues to be used either in therapeutic setting, interpersonal relations and also in dealing with persons with highly compromised communicative skills (Plotnik et al, 2010).

Aims: The present study aims to investigate whether it is possible to identify distinctive acoustic breathing patterns related to different emotional conditions (anger, fear, sadness, disgust, joy and tenderness) and to investigate how “breathing together” influences the attunement process between participants, considering different dimensions: emotional decoding, similarity of the emotional experiences, perspective taking and interpersonal synchrony. In particular we hypothesize that the more synchronized the imitation of the partner's breathing, the more accurate the understanding of his emotional experience.

Procedure 40 women randomly coupled in 20 pairs voluntarily took part to the study. Six narratives, pre-tested for emotional valence and intensity (anger, sadness, fear, disgust, tenderness, joy), were used as a mean of emotional inductions. First, a 90 sec baseline of participants' breathing at rest was audio recorded. Then participants were asked to read alternatively the narratives and to put themselves into the character shoes. The reader (*identification role*) was asked to breath as if she actually were in that situation while her partner (*mirroring role*) had to listen to her breathing and to express her closeness breathing together with her, in the same way. Both participants kept their eyes closed. Separate tracks of participants' breath sounds were audio-recorded for 90 sec. After each task, they both filled in a questionnaire. Two different versions were written for the mirroring and the identification role that investigated the emotions felt while performing the task, participants' perspective taking and emotional decoding ability. Then, they exchange their role and read the next story, following this procedure for 6 times.

Analyses: 1. *Acoustic analysis of breathing tracks:* Audio recording of breathing sounds provided information about features of distinct emotional breathing patterns and about interpersonal synchrony between participants in the attunement task. 420min of breathing audio-tracks were collected. All

RESPs sample of acoustic tracks (210 min) undergo a multilayer analysis. A compound set of measurements that enable a reliable respiratory and acoustic description of breath sounds, as well as to relate partner's respiratory behaviour during the joint task was used (Pellegrini & Ciceri, 2012). *Respiratory indices* includes conventional measurements of temporal features of the respiratory signal; *Acoustic indices*, describe breathing sounds features in particular intensity and timbre features; finally, *Coordination Indices* calculate the lag between couple of participants closest breaths and the number of breaths that fall within 4 progressive thresholds of synchrony. 2. *Emotions identification accuracy*: both raw and unbiased hit rates were extracted for each subject as a measure of identification accuracy. 3. Self reports ratings, respiratory, acoustic and coordination indices underwent descriptive analysis, analysis of variance & contrasts analyses.

Results: The study yielded two relevant findings: first it was possible to draw detailed acoustic descriptions of breathing patterns related to distinct emotions. In particular three groups with similar features emerged: 1. Anger & Fear, 2. Tenderness & Baseline; 3. Joy, Disgust & Sadness. Secondly, breathing together influenced many of the attunement dimensions under investigation: 1. Participants closely matched up the timing of their partner's breathing and became more able as time goes on; in particular, interpersonal synchrony seemed to be related to emotional responding and sense of interpersonal similarity but not to emotion identification accuracy. 2. Participants were more able to identify emotional valence than specific emotions: negative ones (fear in particular) were better identified than positive ones. 3. Participants were able to predict their partner experience and they tended to feel a sense of interpersonal similarity and to experience similar emotions. Concluding, we believe that this research field could provide new, significant understanding to the field of both affective and communication psychology and it could produce effective knowledge and applications to be used in therapeutic settings and interpersonal relations management.

References

- Bandler, R. & Grinder, J. (1975b). *The Structure of Magic II: A Book About Communication and Change*. Palo Alto, CA: Science & Behavior Books.
- Boiten, F.A (1998). The effects of emotional behaviour on components of the respiratory cycle. *Biological Psychology* 49, 29 – 51
- Boiten, F.A., Frijda, N.H. & Wientjes, C.J.E., (1994). Emotions and respiratory patterns: review and critical analysis. *International Journal of Psychophysiology*, 17, 103 – 128.
- Philippot, P., Chapelle & G., Blairy, S. (2002). Respiratory feedback in the generation of emotion. *Cognition and Emotion*, 16(5), 605-627
- Pellegrini, R. & Ciceri, M.R. (2012). Listening to and mimicking respiration: Understanding and synchronizing joint actions. *Review of Psychology*, in publication.
- Plotnik, A., Sela, L., Weissbrod, A., Kahana, R., Haviv, L., Yeshurun, Y., Soroker, N. & Sobel, N. (2010). Sniffing enables communication and environmental control for the severely disabled. *Proceeding of the National Academy of Sciences*, 107(32), 14413-14418.
- Siegel, E. (1984). *Dance Movement Therapy: Mirror of Ourselves: The Psychoanalytic Approach*. New York: Human Science Press.
- Sutton, J. (2002). Preparing a potential space for a group of children with special needs. In A. Davies & E. Richards (Eds.), *Music Therapy and Group Work: SoundCompany*. London: Jessica Kingsley.