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THE COMMUNICATION OF
EMOTIONS IN DANCE*Edith Van Dyck, Birgitta Burger, and Konstantina Orlandatou*

“The truest expression of a people is in its dances and its music. Bodies never lie.”

Agnes De Mille, 1905–1993

Introduction

Without emotions, it could be questioned if our lives would still make sense. They color all aspects of our daily life, sometimes for the better, while at other times we would like to be able to discard them as quickly as possible. In a sense, they are just what make us “feel” alive. Research has indicated that the reasons why we might suddenly start to laugh, feel the tears running down our cheeks, or even want to lash out at someone are manifold, as emotions are essential to our social relationships, psychological well-being, cognitive functioning, moral sensitivity, and other important developmental processes (Sroufe, 1996). Moreover, as they serve as signals that convey information about the friendliness or dangerousness of our environment, both the ability to express and to recognize emotions have proved to be crucial to our survival (Ekman, 1992). Successfully expressing and picking up an emotional state is an effective strategy to avoid risk or spend additional energy (i.e., a frown can prevent a fight), to aid one’s relatives and friends (i.e., a scream can prompt them to run for cover), or to elicit supportive behavior (i.e., a smile can bring on a helping hand) (Campos, Campos, & Barrett, 1989).

In daily life, emotions can be communicated through, for instance, speech prosody (McCann & Peppé, 2003) and/or voice quality (Gobl & Ní Chasaide, 2003; Laukkanen, Vilkman, Alku, & Oksanen, 1997; Scherer, 1986). However, Darwin (1872/2009) stated that the importance of communicating emotions precedes the evolution of verbal abilities, and according to him, humans are capable of displaying emotions through motor behavior. Also convinced of the tight link between movements and emotions, James (1890) believed that the basis of emotion is the bodily activity that occurs in response to an emotional stimulus. In other words, he claimed that emotions are in fact embodiments. In the same line, Merleau-Ponty (1965) assumed that each experience of a quality is in reality an experience of a certain way of movement. More recently, theories of embodied cognition have been applied to the field of emotion research, suggesting that perceiving, experiencing, and thinking about emotions involves embodiment of the relevant emotions in one’s self (Damasio, 1994; Niedenthal, 2007; Niedenthal, Barsalou, Ric, & Krauth-Gruber, 2005).

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Emotion Communication Through Body Movement and Posture

The topic of emotion communication through body movement was rather neglected for a while (probably, at least to a certain extent, due to lack of appropriate technologies), and research focused more on facial expression (e.g., Ekman, 1982) following the hypothesis that gross body movements would communicate only emotion intensity but not qualitative characteristics (Ekman & Friesen, 1974). In this line of research, it was shown that emotions can be adequately communicated through facial expressions, which have distinct and universal expressive characteristics, signaling positive and negative feelings, attitudes, and intentions (Ekman, 1972, 1982; Likowski et al., 2011; Lundqvist & Dimberg, 1995; Moody, McIntosh, Mann, & Weisser, 2007). More recently, research has shifted its focus toward body postures and movements when investigating emotion communication. In the context of human–machine interaction, for instance, Clynes (1973, 1980) tried to get to the bottom of how communication could be made more human-like and efficient. On that account, he experimented with the basic expressive time forms of the central nervous system, or *sentic* forms, which are specific for each emotion. According to Clynes, they are also universal, as people from different cultures were able to correctly identify the emotions expressed by sound stimuli that he derived from people's emotional expressions through touch. Besides the fingers, several other studies have also focused on the communication of emotional content in movement of other parts of the body or of body postures. Pollick, Paterson, Bruderlin, and Sanford (2001), who conducted an experiment in which drinking and knocking movements were performed while expressing different affects, revealed that expressive qualities could successfully be recognized from arm movement. A study by De Meijer (1989) showed that people perceive raised arms and a stretched trunk as happy, whereas a bowed torso is regarded as angry, and arms placed close to the body are seen as sad. Similar findings were reported by Coulson (2004), linking happiness and anger with a backward head bend and outward stretched arms, while sadness was characterized by a forward head bend and arms kept at the side of the trunk. In addition, upright body positions have been related with lower levels of shame, sadness, or boredom (Wallbott, 1998; Weisfeld & Beresford, 1982) and are also judged more positively (Schouwstra & Hoogstraten, 1995). Similar movements are acquired by musicians during performance. Regarding the expression of the performer's emotional intention, it has been demonstrated that slow and smooth movements are associated with sadness, jerky movements are linked with anger, and large and fast movements are connected with happiness (Dahl & Friberg, 2007). Examples of studies such as these indicate that emotions can indeed successfully be expressed by, and recognized from, postures and movements of the body.

What About Dance?

In dance/movement therapy (DMT), it is a shared belief that humans can use dance movement to express themselves in ways they cannot do so with words (Levy, 2005). This type of therapy was already established in the 1940s, after psychiatric patients reported its therapeutic benefits. DMT allows individuals to evoke, connect, and express powerful emotions more immediately than with traditional therapeutic interventions, due to its application of body-felt experiences (Brooks & Stark, 1989; Kuettel, 1982). Besides, through observing movement, both the participant's physical and psychological strengths and constraints can be assessed by the therapist, who can then use this information to shape the direction of the therapeutic session (Anderson, Kennedy, DeWitt, Anderson, & Wamboldt, 2014).

In research, the idea that emotions can be communicated through dance has been explored in more detail, especially in the area of music psychology. It is believed that expressive body movement encoded through dance can be distinguished from propositional movement patterns in that the movement

patterns are meant to be stylized and focused expressions of the more subtle, naturalistic movement patterns associated with direct, spontaneous expressions of emotion. As such, dance is perfectly suited for exploring the key elements of naturalistic motion (e.g., force, velocity, timing, and spatial orientation), which could reveal the emotional content of the corporeal articulations more directly (Boone & Cunningham, 1998; De Meijer, 1989). Regarding emotion expression, researchers have started to classify the types of dance movements prompted by different emotional states. In a study by Lagerlöf and Djerf (2000), for example, movement cues extracted from recordings of dancers portraying emotions of joy, grief, anger, and fear were compared, revealing distinct differences in emotion expression. The results suggested that joy, anger, and fear were related to frequent tempo changes, while only few changes of pace were displayed in the grief condition. Besides, the tendency for movements to project outward from the center of the body could be related with emotions of joy and anger. In similar research by Camurri, Lagerlöf, and Volpe (2003) and Camurri, Mazzarino, Ricchetti, Timmers, and Volpe (2004), using automated recognition techniques to track the important emotion recognition cues and testing the same set of emotions, remarkably longer duration of grief performances were revealed compared to the other emotions. Also, movements proved to be more contracted in the grief and fear conditions than in the joy condition, whereas performances of joy received significant higher Quantity of Motion (a measure of the total amount of detected motion) scores than did those for grief.

Other studies have put the emphasis on the recognition of emotional content from dance movement. Walk and Homan (1984) asked observers to view point-light displays of dancers representing different emotions (sadness, happiness, fear, surprise, anger, and contempt). In point-light displays—a technique often used when studying affective bodily expression—the viewer observes a set of points of light that are attached to the body in such a way that only the lights are visible, distilling a person's body to leave only dynamics displayed. It was shown that, even without cues from the face, the observers accurately identified the emotional quality portrayed in the dances, with anger and fear being recognized more accurately than other emotional expressions. Dittrich, Troscianko, Lea, and Morgan (1996) reported comparable findings. In their study on emotion perception, clips of dancers expressing emotions of fear, anger, grief, joy, surprise, and disgust were shown to a group of observers. Results indicated that both when presenting full-body clips (masking facial expression) and point-light scenes, decoding of emotionality was well above chance, although higher recognition rates were reported for the full-body stimuli. In addition, it seemed that especially movement information of positive emotions (joy, surprise) and anger facilitated emotional differentiation compared to the other emotions under study. Also, Brownlow, Dixon, Egbert, and Radcliffe (1997) exposed that, when determining emotion characteristics from point-light displays of dance, observers were easily able to determine dancer traits from happy and sad dances. In order to shed more light on the developmental stage of emotion perception, Boone and Cunningham (1998) tested from which age onwards humans would be able to recognize emotional content (emotions of happiness, sadness, anger, and fear) expressed in dance movement. The researchers showed that 4-year-old children were able to successfully decode sadness; 5-year-olds were able to recognize sadness, fear, and happiness; and from the age of 8 years onwards, participants were able to decode the full variety of emotions from dance movement.

From this body of research, it seems that, in general, people are able to express emotional content through dance, exhibiting distinct motion characteristics linked with specific emotion categories. In addition, people can recognize this content by observing dance movement, either presented fully or displayed in a more concentrated manner such as in point-light displays. However, many issues still should be taken into consideration when drawing conclusions from the existing body of research.

Nature of the Expression

One of the aspects that deserves exceptional attention concerns the nature of the expression. In the studies described above, videos of actors or dancers portraying emotions have been used. As such, the

focus of the research was on posed expression, considering only deliberate, portrayed expressions of emotion. The assumption underlying the focus on emotions presented through acting is that actors are typically believed to be experts in displaying emotional information corporeally. However, several studies have revealed that not all actors generate equally recognizable, emotionally expressive corporeal articulations (Gross, Crane, & Fredrickson, 2010; Montepare, Goldstein, & Clausen, 1987; Wallbott, 1998). The employment of posed expression also tends to lead to exaggerated postures and gestures, which may not reflect everyday situations in the best way, as emotion expression in everyday life is generally rather subtle, and at times even deliberately controlled and inhibited (Saarikallio, Luck, Burger, Thompson, & Toiviainen, 2013).

As being ecologically more valid, research has recently started to shift its attention from posed expression toward the study of spontaneous communication of emotion through dance. In light of this shift, it is important to emphasize the distinction between perceived emotion (i.e., to perceive emotional expression in music without necessarily being affected oneself), and felt emotion, which concerns the emotions induced in the dancer (Gabrielsson, 2002). Both are equally relevant as, when dancing, both emotions perceived from the musical stimuli as emotions induced in the dancer have been shown to affect the movement qualities of the dance. Burger, Saarikallio, Luck, Thompson, and Toiviainen (2013) investigated the relationship between movement and perceived emotional content, and checked which body parts and movement characteristics could be linked with emotions expressed in music. Participants were asked to move to a range of music stimuli in a way that felt natural. Dance movement was recorded and various postural and kinematic features were extracted from those particular movements. Moreover, the emotional content of the stimuli was assessed in a perceptual experiment where participants were asked to rate the excerpts according to what they thought the musical stimuli expressed/conveyed. It was revealed that each emotion category could be associated with a different set of movement features, which could therefore be assumed to be emotion-specific. Happy music was linked with body rotation and high-dimensional movements, whereas, when exposed to music that is considered angry, participants moved in an irregular and jagged way while not rotating the body. In the case of sad music, movements proved to be rather simple and of low dimensionality, and tender music was embodied through a forward tilted torso and fluid movements with low acceleration. Out of these results it could be concluded that the perceived affective content of music does have an unconscious effect on dance movement. In a follow-up study (Burger, Thompson, Saarikallio, Luck, & Toiviainen, 2013b), observers were presented with audio-only, video-only, and audio-video excerpts (congruent as well as incongruent music–movement combinations), and subsequently, they were asked to rate the emotional content perceived in the excerpts. The results showed that almost all target emotions could be recognized from the different conditions, although systematic mismatches occurred, especially with examples related to tenderness. The audio-only condition was most effective in conveying the target emotions, followed by the audio–video condition. In the video-only excerpts, anger was often mistaken for happiness, suggesting that spontaneous dance movements might be perceived rather as positive and pleasant than as negative and angry, since the activity as such is commonly understood as fun and enjoyable.

Because induced emotions are supposedly equivalent to naturally occurring emotions (Jallais & Gilet, 2010), Van Dyck, Maes, Hargreaves, Lesaffre, and Leman (2013) explored the expression of induced emotions through dance. In this study, emotions of happiness and sadness were induced using a combined emotion induction method; foreground attention was manipulated by guided imagery, consisting of a series of sentences describing particular situations in which the participants were asked to imagine themselves, while emotion-supporting music was played in the background. After the induction, participants were invited to move in any way they wanted to an emotionally neutral piece of music, composed specifically for the experiment in order to control for possible effects of familiarity. It was revealed that dance movement was significantly faster and more accelerated in the happy condition than in the sad one. In addition, participants made more expanded and impulsive

movements when emotions of happiness were being induced. Significant differences in corporeal articulation were especially obtained for movement of the hands. In a succeeding study, the recognition of induced emotional content from dance was examined (Van Dyck, Vansteenkiste, Lenoir, Lesaffre, & Leman, 2014). Observers viewed a set of silent videos showing depersonalized avatars performing the dance movements that were recorded in the previous experiment. They were asked to rate the emotional state of each dance performance, and eye movements were recorded in order to track the specific focus of the observers. Results of this particular study revealed that people are indeed able to decode induced emotional content from corporeal articulations in dance. Though it was expected that the observers would specifically focus on hand gesturing due to the findings of the previous study, eye-tracking data unveiled a general focus on the chest area. This could be explained by a holistic model of image perception, a visual strategy suggesting that observers pay less attention to specific body segments as separate parts of the body, but rather see the human body as one entity. Thus, using dance movement, the human body is able to reflect emotional qualities perceived in music. With regard to felt emotions, it has been shown that these can also be adequately expressed in dance movement after being induced and are recognizable to others. As such, it seems that not only posed expression but also spontaneous expression of emotion can be successfully communicated through dance.

Emotion Models

Another issue that pops up when considering research on expressive dance concerns the choice of the specific emotion categories and models that should be regarded. Aside from some domain-specific emotion models (e.g., GEMS, see Zentner, Grandjean, & Scherer, 2008), the two dominant models used in music and emotion research concern the discrete (basic) and the dimensional emotion model (Juslin & Sloboda, 2010). The first approach incorporates the idea that emotions are discrete, fundamentally different constructs (e.g., happiness, sadness, fear, etc.); the second one asserts that emotions can be characterized on dimensional axes (e.g., valence, arousal, etc.). Both models have advantages and disadvantages. As most of the previously mentioned examples have employed the discrete model to research emotion expression, the usage of a similar set of emotions has the asset that it facilitates the comparison of data from different studies. Yet, a downside of this model is that basic emotions can be more easily mixed and confused with each other in discrimination tasks (Eerola & Vuoskoski, 2011). This issue might be reduced by using a dimensional approach, in which all affective states are represented as a combination of two (e.g., valence and arousal) or three (valence, arousal, and tension) mutually independent dimensions. However, the disadvantage of the dimensional model is that it has proved to comprise a low degree of resolution and differentiation (Scherer, 2004). An adequate option to avoid this issue could be to combine both models, which was the case in the study by Burger, Saarikallio et al. (2013) where, besides the discrete emotions discussed above, the relationships between kinematic features and levels of valence (unpleasant—pleasant) and arousal (inactive—active) were also regarded. As it seems, active music was characterized by a high amount of movement in general but also by other movement characteristics indicating the activity in the music, such as high acceleration of head, hands, and feet, non-fluent movement, and an upright torso. Participants displayed smoother movements and more body rotation when being exposed to music rated high on valence.

Level of Dance Expertise

It could be debated whether emotion research should focus on professional or recreational dancers. In the past, most studies have employed professional dancers to express emotional content in dance (e.g., Brownlow et al., 1997; Camurri et al., 2003, 2004; Dittrich et al., 1996; Walk & Homan, 1984).

Although observers with dance training have been shown to be better at making fine discriminations among dance movements (Brownlow et al., 1997), similar results with regard to the expression of emotions were found when comparing professional with novice dancers. Therefore, it could be presumed that not much difference between the expressional behavior of experts and non-experts exists. However, the most recent tendency in research has been to focus on the emotion expression of non-professional dancers as opposed to expert dancers (e.g., Burger, Saarikallio et al., 2013; Van Dyck, Maes et al., 2013). It is believed to facilitate more accurate, diverse, and natural expression of emotion, moving away from the prescribed, choreographed “dance routine” of professionals who, due to certain artistic reasons, might have learned to conform their expressions (e.g., to the music and/or to other specific targets), while disregarding their own emotional state. As participants are granted the freedom to move intuitively, arguably, they could feel less inhibited, and therefore, might move in a less restrictive fashion. Thus, this method could prove to be a more ecologically valid approach for studying emotion communication through dance. However, as there is still a lack of research regarding the differentiation in behavioral qualities of participants with different levels of expertise, this matter still remains open for discussion.

Musical Stimuli

The selection of musical stimuli also deserves attention. On the one hand, music used in dance experiments should induce movement, for which a relatively clear and perceivable beat structure is favorable. However, for studying the possible effect emotions could have in relation to dance, the music should be able to express and/or induce emotions clearly and explicitly. Finding emotionally unambiguous and danceable stimuli might be a challenge, in particular for negative and inactive emotions. Burger, Saarikallio et al. (2013) opted for a “danceable” set, while Van Dyck, Maes et al. (2013) chose to present a neutral stimulus, suggesting further experiments to be conducted with stimuli that are purely selected based on their emotional characteristics.

Gender

It could be further questioned whether males express and/or perceive emotions differently than females. Many of the previous research studies did not direct any special attention toward gender differentiation (e.g., Boone & Cunningham, 1998; Burger, Saarikallio et al., 2013, Camurri et al., 2003, 2004) or did not find such effects (e.g., de Meijer, 1989; Dittrich et al., 1996). However, some studies did report gender differences in emotion communication characteristics. The gender of the observer has been shown to affect emotion recognition precision from dance, revealing that female participants are better at recognizing emotional states in comparison with their male counterparts (e.g., Brownlow et al., 1997; Walk & Homan, 1984). Other research also indicated gender differences regarding the performer (e.g., Van Dyck et al., 2014), suggesting that women are more proficient in expressing their personal feelings in a corporeal manner compared to men. This is in accordance with reports demonstrating that women are more emotional, and they experience and express emotions more intensely than men do (Donges, Kersting, & Suslow, 2012; Kring & Gordon, 1998).

Conclusion

There is enough evidence to support that emotions can be communicated through dance. People express emotion (either felt, perceived, portrayed, or a combination of these) in their dance moves, and these emotions can be recognized successfully. However, some constraints do exist. Drawing conclusions regarding the expression and recognition of emotional messages through dance gestures should be carefully examined. It is important to make careful choices about the suitability of the

material, such as the type of expression, the emotion model, the music, or the target group. Of course, it is worth considering other factors that can influence the dance movement, such as the personality and musical preference of the dancers (Luck, Saarikallio, Burger, Thompson, & Toiviainen, 2014); the neurological, muscular, and skeletal qualities of the dancers (Taga, 1995); or the qualities of the music (Burger, Thompson, Luck, Saarikallio, & Toiviainen, 2013a; Van Dyck, Moelants, Demey, Deweppe, Coussement, & Leman, 2013). Do not forget that contextual factors can also affect dance movement, such as the time of day, the environmental qualities, and the social situation. Overall, dance reflects our emotional state more than we might think it does, so check out the moves of your fellow dancers the next time you are on the dance floor—you could learn more from them than you might have guessed.

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