

Differences in Nonverbal Behavioural Patterns after Receiving Positive and after Receiving Negative Feedback

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Abstract

This research focused on nonverbal behavioural patterns after receiving feedback. Twenty female contenders of America's Next Top Model were analyzed directly after receiving positive or negative feedback using the ECSI-scale (Troisi, 1999). A significant effect was found for submission and a trend effect was found for displacement behaviour and relaxation. Also significant results were found in individual behavioural patterns. When receiving negative feedback participants were more submissive, tilted their head more to the side, had a more neutral face, had their mouth corners back more often and smiled and laughed less. The set-up of the show with a jury, cameras and other candidates could have affected the (nonverbal) reaction of the contenders which is an important limitation.

Keywords: Nonverbal behaviour; emotional leakage; receiving feedback; expressions; emotion; positive feedback; negative feedback.

Introduction

Nonverbal behaviour can give us more accurate information about one's emotional state than verbal statements alone. Ekman and Friesen (1969, in: Troisi 2002) introduced the term 'emotional leakage', indicating that nonverbal behaviour reflects one's subjective affective state more accurately than self-reports on emotion which are often subject to either greater conscious deception or unconscious masking. This is one of the reasons why nonverbal behaviour is important in studying human behaviour, and specifically, in the detection of human emotions. Practically, insight in the nonverbal reflection of human emotions can help us to signal, understand and react more accurate to human emotions. More theoretically, this insight can help us in the field of artificial intelligence to build robots that are capable of detecting human emotions by certain patterns of nonverbal behaviour.

Theoretical Framework

1.1 Emotions And Nonverbal Behaviour

Defining the concept of emotion is not easy and scientists do not seem to agree on what emotions precisely are. Despite this, it is agreed that external or mental events play a role in eliciting emotional behaviour (Frijda, 2005; Ekman, Friesen, & Ellsworth, 1972). One thing that is clear about emotions is that they consist of three components. Barbalet (2001) stated that emotion includes "a subjective component of feelings, a physiological component of arousal or bodily sensation, and an impulsive or motor

component of expressive gesture" (p. 84). Thus, emotion is an inner feeling, which also shows in voluntary and involuntary bodily behaviour. Examples of this are, amongst others, an increased heart rate, laughter and crying. Emotion also shows in facial expressions, gestures and other nonverbal behaviour. These expressions are instantaneous, brief, static (facial) configurations which are based on extreme positions of the muscles. Emotion intensity can also be seen in the face, as the muscular tension is positively correlated to intensity (Fernández-Dols, 2013).

1.2 Measuring Nonverbal Behaviour

As Barbalet (2001) stated, emotions are reflected in an impulsive or motor component of expressive gesture. The Ethological Coding System for Interviews (ECSI), an ethogram designed for measuring the nonverbal behaviour during interviews, can be applied to measure nonverbal behaviour in situations where people experience strong emotions like, for example, while receiving feedback. The ECSI includes 37 different behavioural patterns, mostly facial expressions and hand movements. The analysis of nonverbal behaviour can be based on the scores of behavioural categories derived from the combination of eight behavioural patterns (Troisi, 1999).

The behaviour pattern 'Look at' contains the nonverbal behaviour of gazing at another's face, serving to express attention and involvement to monitor the interactant's behaviour and to regulate conversational sequencing. The behavioural patterns grouped in the category 'Affiliation' are displayed in order to express friendliness and consist of facial expressions and head movements which invite social interaction, reflecting a positive attitude. The category 'Gesture' includes hand movements that accompany, illustrate and accentuate the verbal content of utterances. Nonverbal behaviours that serve to cut off the sensory receptors from incoming social stimuli perceived as stressful or aversive can be categorized as 'Flight'. The category 'Displacement behaviour' includes behavioural patterns that consist of movements which are focused on one's own body or which iteratively handle certain objects, which can occur in situations characterized by social tension and motivational conflict. Increased displacement behaviour correlates with a subjective feeling of anxiety and negative affect. Contrary to this behaviour pattern, 'Relaxation' refers, among other behaviours, to a loosening of overall muscle tension, which is indicative of a low level of emotional arousal. Facial expressions and head movements that signal low-levelled aggression and hostility can be referred to as 'Assertion'. Finally, nonverbal gestures

like nodding are categorized in the category 'Submission', which are used to prevent or inhibit hostile responses, and denote a submissive attitude (Troisi, 1999).

1.3 Emotion And Nonverbal Behaviour While Receiving Feedback

The nonverbal representation of emotions is the topic of this study, in particular in a situation where one gets either positive or negative feedback. Most research is done in the field of education, because obtaining feedback is crucial to learning in these situations. Värlander (2008) studied the role of students' emotions in formal feedback situations. She described that confidence, anxiety and fear are important emotions in a feedback setting. When receiving positive feedback, one will feel confident. In contrast, when receiving negative feedback one is more likely to feel anxiety and fear. Sergeant, Mann, Sinclair, Van der Vleuten and Metsemakers (2008) described that receiving negative feedback leads to strong negative emotions, resulting in anger, shame and powerlessness. These two studies show different emotions that can be felt after receiving feedback, and the only aspect on which they all match is the valence of emotion. Weiner (1985) describes that the exact emotions one feels when succeeding or failing are dependent of the attributions that one generates for the success or failure, but that they are based on feeling happy when one is successful and feeling frustrated and sad when one is failing. Receiving positive feedback can elicit surprise when one does not expect good news, or relief when one has made a great effort for success. According to this, it is difficult to hypothesize what exact emotions one will feel after receiving feedback, even though it is clear what the valence of the emotions will be.

1.4 Research Question And Hypotheses

The goal of the current study is to explore the nonverbal behaviour of female participants of the TV-program *America's Next Top Model* after receiving positive and negative feedback from the jury. Our main research question is: *What are the differences in nonverbal behavioural patterns after receiving positive and after receiving negative feedback?* In this specific context, nonverbal behaviour is defined as nonverbal facial expressions and gestures, according to the ECSI-scale.

In preceding studies, although conducted in different contexts, it has been found that receiving positive feedback leads to a feeling of confidence and relief. Therefore, we hypothesize that receiving positive feedback will lead to more nonverbal behavioural patterns in the ECSI-categories of Affiliation and Relaxation than in the other ECSI-categories. Affiliation, as a reaction to positive feedback, will lead to higher levels of friendliness and facial expressions and head movements that invite social interaction, reflecting a positive attitude of the participant towards the person who gives the feedback. Relaxation will

lead to a loosening of overall muscle intention, adjusting movement into a more comfortable position and smiling.

Second, we hypothesize that receiving negative feedback will lead to more nonverbal behavioural patterns in the ECSI-categories of Flight, Displacement, Assertion and Submission than in the other ECSI-categories. Flight, as a reaction to negative feedback, will lead to higher levels of looking away and/or looking down, closing the eyes and a sudden cessation of movement and facial expression. Displacement, which occurs in situations characterized by social tension and conflict, will lead to higher levels of movements which are focused on one's own body like twisting and fiddling finger movements. Assertion, which signals low-levelled aggression and hostility, will lead to headshaking, frowning, shrugging and wrinkling. Submission, which is used to inhibit and prevent hostile responses, will lead to nodding and a submissive attitude towards the person who gives the feedback.

Stimuli Collection

Selection Criteria And Procedure

This study used fragments from the TV-program *America's Next Top Model* to explore which nonverbal behavioural patterns the participants show after receiving positive and negative feedback. First and foremost, the fragments had to include the reaction of a model, after receiving either positive or negative feedback. 20 models were included, based on age, race and gender. The youngest model was 18 years old and the oldest model was 25 years old, with an average of 21 years old. Only white models were included and all the models were female, to avoid the effects of either race or gender on the nonverbal behavioural patterns. For every model both a reaction on positive feedback and negative feedback was chosen, so that personal manners of showing emotions could not effect one of each conditions more or less, since these personal manners of models were included in both conditions. In total 40 fragments were used; 20 reactions on positive feedback and 20 reactions on negative feedback. The fragments were collected from six seasons of *America's Next Top Model* (season one, three, six, seven, eight and nine) available on DVD.

Video Editing

The videos were edited with Windows Live Movie Maker: a movie editor available for computers that run on Windows. Per fragment that had to be made, the relevant episode of the TV-program was opened in Windows Life Movie Maker. After that, the moment of feedback in the TV-program was located, which was most of the time somewhere near the end of the episode. While establishing the moment of feedback, it had to be determined if the fragment was suitable for the research. Namely, the feedback had to be either positive or negative (instead of neutral or a combination of both conditions) and in the reaction the model had to be clearly visible. In addition, per

fragment the first reaction on the feedback was used, so that the reaction of the model was as sincere as possible. When the exact fragment was located, the episode was cut from the exact time the fragment started (for example, 30:30,57) to the exact time the fragment ended (for example, 30:32,11). Then the video was saved to a Windows Media Video file (wmv). Every video was approximately 1 to 3 seconds long; exactly the time the reaction of the model was visible. In Figure 1 two screenshots are presented from two video fragments; the left image is the reaction of a model after negative feedback and the right image is the reaction of the same model after positive feedback.



Figure 1: Screenshots from the Video Fragments in both Conditions

Coding

The video fragments were analysed by using the coding system of the ESCI-scale (Troisi, 1999). The ESCI-scale was used in order to have a clear overview of the models' nonverbal behaviour with regard to their facial movements. Furthermore, utilizing the ESCI-scale also enabled the coders to also analyse the models' behaviour even when they were not frontally facing the camera.

Behavioural category 3 in the ESCI-scale was not included in the results. This category contained 'gestures', but since the models did not speak during the video fragments, the analyses of this category yielded few results. All other categories were included in the results. These categories were: Look at, Affiliation, Flight, Displacement behaviour, Relaxation, Assertion and Submission.

When a certain behavioural expression mentioned by the ESCI-scale was present in the video fragment, the score 1 was assigned to this expression. If a certain behaviour was not present, the score 0 was assigned. Four of the researchers coded the fragments. In order to be more objective and not influence each other's judgment, each researcher analysed the video fragments separately. In addition, every researcher only analysed one condition per model, meaning every researcher analysed a certain model in either the situation with positive feedback or in the situation with negative feedback. Furthermore, the sound of clips was turned off during the analysis and the coders did not know beforehand if the feedback was positive or negative. Each researcher also analysed each video fragment twice in order to collect more detailed information. All different behavioural expressions in all main categories were assigned either a 1 or a 0 and are separately included in the statistical analysis.

Analysis

A dependent t-test was performed with 'Negative feedback' and 'Positive feedback' as conditions, to analyse the data. Firstly, all the individual behavioural expressions mentioned in the ESCI-scale were analysed separately. After that, the sum of the main categories was determined and analysed.

Results

The behaviour of the models in the positive feedback condition was compared to the behaviour of the models in the negative feedback condition by performing a paired samples t-test. Firstly, the sum scores of the main behavioural categories were compared. This analysis showed that there was a significant effect for 'Submission' ($t(19)=2.89$, $p<.01$) and there was a trend effect for 'Displacement behaviour' ($t(19)=1.83$, $p=.08$), for 'Relaxation' ($t(19)=2.04$, $p=.06$). Models who received negative feedback were more submissive and showed slightly more displacement behaviour and were slightly less relaxed than models who received positive feedback. No significant effect was found for the other behavioural categories ('Look at': $t(19)=1.00$, $p=.33$; 'Affiliation': $t(19)=0.00$, $p=1.00$; 'Flight': $t(19)=0.78$, $p=.45$; 'Assertion': $t(19)=0.00$, $p=1.00$). The results are shown in Table 1.

Table 1: Means of the Behavioural Categories in the ESCI-Scale per Condition

Category		Condition	
		Positive N = 20	Negative N = 20
1	Look at	1.00 (0.00)	0.95 (0.22)
2	Affiliation	0.95 (0.69)	0.95 (0.94)
3	Gesture	-	-
4	Flight	0.50 (0.95)	0.70 (0.73)
5	Displacement behaviour	0.05 (0.22)	0.20 (0.41)
6	Relaxation	0.80 (0.41)	0.50 (0.51)
7	Assertion	0.25 (0.55)	0.25 (0.55)
8	Submission	0.70 (0.92) **	1.50 (0.83) **

* $p < .05$, ** $p < .01$, *** $p < .001$.

Secondly, the scores of the individual behavioural patterns were compared by using a paired samples t-test. The analysis showed that there was a significant effect for 'Head to side' ($t(19)=2.35$, $p<.05$), 'Smile' ($t(19)=2.99$, $p<.01$), 'Laugh' ($t(19)=7.56$, $p<.001$), 'Neutral face' ($t(19)=3.94$, $p<.01$) and 'Mouth corners back' ($t(19)=2.93$, $p<.01$). Models in the negative feedback condition tilted their head more to the side, showed more neutral face and had their mouth corners back more often than models in the positive feedback condition. They smiled and laughed less than models in the positive feedback condition. There were no significant effects found for the other behavioural patterns. Table 2 shows the behavioural patterns for which

significant results were found. The results for the other behavioural patterns are listed in Appendix 1.

Table 2: Means of the significantly different behavioural patterns in the ECSI-scale per condition

Category	Behaviour	Condition	
		Positive N=20	Negative N=20
2	Affiliation		
	Head side to Smile	0.10 (0.31)*	0.40 (0.50)*
6	Relaxation		
	Laugh	0.75 (0.44) ***	0.00 (0.00) ***
8	Submission		
	Neutral face	0.05 (0.22) **	0.50 (0.51) **
	Mouth corners back	0.15 (0.37) **	0.60 (0.50) **

* $p < .05$, ** $p < .01$, *** $p < .001$.

Conclusion

The current study explored which nonverbal behavioural patterns are shown by participants of the TV-program *America's Next Top Model* after receiving positive and negative feedback, in order to answer the question whether there are differences in nonverbal behaviour after receiving positive or negative feedback. The first hypothesis predicted that receiving positive feedback would lead to more nonverbal behavioural patterns in the ECSI-categories of Affiliation and Relaxation than in the other ECSI-categories. This hypothesis cannot be confirmed. Nevertheless, there has been found a tendency of more Relaxation-behaviour after receiving positive feedback than negative feedback, which could become significant in a larger sample. The second hypothesis predicted that receiving negative feedback would lead to more nonverbal behavioural patterns in the ECSI-categories of Flight, Displacement, Assertion and Submission than in the other ECSI-categories. This hypothesis can partly be confirmed, with respect to Submission-behaviour, which is shown more after receiving negative than after receiving positive feedback. There has also been found a tendency of more Displacement-behaviour after receiving negative feedback than positive feedback, which could become significant in a larger sample as well.

When looking at differences in nonverbal behaviour on the singular level, as parts of the ECSI-categories, smiling (as part of ECSI-category Affiliation) and laughing (as part of the ECSI-category Relaxation) is logically shown more after receiving positive than after receiving negative feedback. On the other hand, neutral face (as part of ECSI-category Relaxation) and mouth corners back (as part of the ECSI-category Submission) are shown more after receiving negative feedback than after receiving positive feedback. All in all, this study showed that negative feedback, in this case, lead to more submissive nonverbal behaviour than positive feedback did.

Discussion

The current study showed a significant effect of negative feedback on submissive nonverbal behaviour, a tendency of an effect of negative feedback on displacement nonverbal behaviour and a tendency of an effect of positive feedback on relaxation nonverbal behaviour.

Submissive nonverbal behaviour is directed at preventing or inhibiting hostile responses, and denotes a submissive attitude towards the person who gives the feedback. In the context of this study, the TV-program *America's Next Top Model*, this could imply an intention of the contestant to prevent the jury from giving more or stronger negative feedback and an attitude of submission towards the jury. Displacement nonverbal behaviour is characterized by social tension and motivational conflict and correlates with a subjective feeling of anxiety and negative affect. In the context of *America's Next Top Model*, it is possible that displacement-behaviour is directed at hiding anxiety and negative affect from the jury after receiving negative feedback. Relaxation nonverbal behaviour indicates a low level of emotional arousal, either positive or negative. In the context of this study this could imply that contestants show lower levels of positive emotions after receiving positive feedback, than negative emotions after receiving negative feedback. An explanation for this could be the artificial and competitive character of the program, the fact that all cameras are directed at the contestant at the moment she receives feedback and the presence of co-candidates. This could incite the contestant to smoothen or somewhat hide her positive emotions, in order not to lose face or offend the other candidates. Negative emotions on the contrary could be more difficult to control than positive ones, although the risk of face-losing is much higher after receiving negative feedback than after receiving positive feedback. More specific research is needed to confirm or disconfirm these possible explanations.

Nevertheless, this study cannot be generalized without any reserves to a larger population. First, the subjects of this study were young white female American contestants of the TV-program *America's Next Top Model*, in the age of 18 to 25 years old. Because of the somewhat artificial and competitive character of the situation, the subjects might have reacted different after receiving feedback than they would do in everyday life. It is possible that male subjects, older subjects and non-American subjects would react different in this situation, as well as in other situations. All subjects in this study were either professional models or had at least the ambition to become one. In general, models are well capable of controlling their nonverbal behaviour, and especially their facial expressions, which could have influenced the extent to which they showed emotions nonverbally in a natural way.

Second, because the analyzed clips were quite short, with an average duration time of three seconds, we only analyzed primary nonverbal reactions on feedback. It is possible that secondary nonverbal reactions on feedback

would show a broader or a different range of nonverbal behaviour, showing other results.

Third, previous feedback and the phase of the contest the subjects were in may have influenced the way they reacted on the feedback in the clips analyzed. For instance, when a subject previously received a lot of negative feedback, this could intensify the reaction to positive feedback. Contrary, when a subject previously received a lot of positive feedback, this could intensify the reaction to negative feedback.

All this implies that future research could be directed at the analysis of nonverbal reactions on positive and negative feedback in more natural everyday situations, with a bigger and more homogeneous sample of subjects. Moreover, it would be interesting to compare primary nonverbal reactions to feedback with secondary nonverbal reactions to feedback.

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