

“Who is the mole?”

Detecting non-genuine relief on people’s faces

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Abstract

This study examines whether people can distinguish genuine from non-genuine facial expressions and what role expressiveness plays in this. Fragments of the elimination scenes of the Dutch TV-show “Wie is de Mol” (WIDM) were used. In the fragments, candidates of the show found out that they proceeded onto the next episode and showed relief in response. The mole, however, already knew he/she would proceed, so the relief of the mole was non-genuine. The participants in this study ($N = 50$) filled out a questionnaire consisting of 24 clips of elimination scenes and answered questions about the extent to which they thought the relief of the person in the fragment was genuine and how expressive they thought this person was. The results showed that moles (non-genuine) were seen as more sincere in comparison to candidates (genuine), and that expressive persons were judged as more sincere.

Keywords: facial expressions; genuine vs. non-genuine emotion; relief; expressiveness.

Introduction

Humans can have control over their facial expressions. Therefore, they can create a certain expression even though they do not feel the emotion expressed (Ekman, 1993; Hall, Murphy & Schmid Mast, 2007). Despite the fact that everyone can fake an emotion, there are different cues that may reveal that a person is not really feeling the emotion that is shown. Ekman (1993) states that the distinction between genuine and non-genuine expressions can be detected by the absence (or presence) of certain facial muscular actions. However, these muscular actions may be small, or might only have the duration of a couple of milliseconds, which makes it hard to detect them with the bare eye. Burgoon, Blair and Storm (2008) take this a step further and state that “humans are poor detectors of deception” (p. 572).

Talwar and Lee (2002) conducted a study in which they asked participants to watch video-clips in which children were either telling the truth or a lie. Participants were asked to judge whether the child was telling the truth. Results showed that participants could not differentiate liars from non-liars, based on their overall non-verbal behavior. Frank and Ekman (2004) also conducted a study about sincerity. Similar to the results of Talwar and Lee’s (2002) study, their results showed that participants could not identify liars based on facial expressions. They state that other non-facial elements are related to detecting deception.

When examining the emotional expressiveness of a person, the outward display of emotion is investigated, regardless of whether the emotion is either positive or negative, and regardless of the channel of expression (Kring, Smith & Neal, 1994). Facial expressiveness thus refers to the amplitudes of the outward display of emotion by the face. Tkalčič, Odić and Košir (2013) analyzed the expressiveness of participants, and investigated the accuracy of an emotion detection algorithm. They divided expressiveness into three categories: low-, mid-, and highly expressive. The accuracy of detection from low to mid increased, while accuracy dropped going from mid to high. Tkalčič and colleagues (2013) blame this on the fact that high expressiveness is not seen as spontaneous, and thus as non-genuine compared to low and mid expressiveness. Even though the study of Talwar and Lee (2002) discussed before shows similar results in that their participants were unable to distinguish liars from non-liars, their results show that lie-tellers show more facial expressiveness than non-liars.

In the current study, the emotion *relief* will be investigated. Relief is an emotion that is felt at the end of an uncomfortable or unpleasant situation (Valstar, Jian, Mehu, Pantic & Scherer, 2011). Relief is not frequently studied in the context of detecting genuine and non-genuine expressions. Therefore, the interest lies in investigating to what extent people are able to detect the sincerity of this emotion, when looking at facial expressions. The research question is:

To what extent can people distinguish genuine from non-genuine relief based on facial expressions, and does expressiveness play a role in this?

Based on the literature, the following hypotheses are formulated:

- H1: People cannot distinguish genuine from non-genuine relief based on facial expressions.
- H2: People who show high emotional facial expressiveness, are seen as less sincere than people who show low emotional facial expressiveness.

Stimuli Collection

Selection Criteria and Procedure

In order to investigate whether facial expressions reveal if a person shows genuine relief, the Dutch television show “Wie is de Mol?” (WIDM) is used, in which one person has to fake his or her relief, while others show sincere relief. The goal of this show is to find out who of the ten candidates is the mole. In every episode, the candidates try to earn as much money as possible through various games. The mole, however, tries to sabotage the games and to make the group earn as little money as possible. At the end of every episode, the candidates fill out a test about the identity of the mole, and the one that answers most questions incorrectly has to go home. Therefore, the candidates are unsure about whether they will continue to the next round, while the mole can never be eliminated and knows this. At the end of each episode, the candidates find out whether they proceed to the next episode, via a screen that either turns green (proceed) or red (eliminated). When seeing a green screen, a candidate will be relieved, and after a red screen he or she will be disappointed. Therefore, only fragments in which a green screen is shown are used.

In total, 24 fragments were collected from YouTube. Two relief fragments of each of the first twelve seasons of the show were chosen: one fragment of the mole (non-genuine) and one of a candidate (genuine). This means that there were two conditions: genuine relief and non-genuine relief. Each condition consisted of 12 fragments. The participants saw all fragments of both conditions. Mainly headshots were used, because the facial expressions were the main interest. The last two seasons of the show were not included, because the show won a national television award in 2013 and gained a lot of popularity in the Netherlands afterwards. Therefore, the fragments of those seasons are likely to be known by a large number of people, and were only used as practice material for the participants.

Video Editing

For this study, only the moments of the show at which the green screen is shown were useful. For this reason, the videos were edited so that only the useful couple of seconds were shown to the participants of the study. These couple of seconds showed the moment after either a participant or the mole saw the green screen. All fragments started at the same specific moment in all conditions. First, the participants will see a screen turning green, then they will see the reaction of the mole or candidate. The duration of the fragments varied between three and seven seconds. Furthermore, the sound of the fragments was deleted, so the

participants could not be influenced by auditory cues. This manipulation was done in order to be sure that facial expressions were the only cue for the participants to detect relief.

Perception Test

Participants

In total 65 participants took part in this study. Because fifteen participants had either not completed the whole questionnaire or were already familiar with all clips, their answers were eliminated from our data set. The remaining fifty participants consisted of 27 females and 23 males. Their ages ranged from a minimum of 17 to a maximum of 59, with a mean age of 30.98 ($SD = 14.57$).

Materials and Procedure

An online questionnaire was constructed to find the answer to the research question, for which the online program ‘Qualtrics’ was used. The questionnaire was in Dutch and started with a word of welcome and thank you to the participants. It stated that filling out the questionnaire would take about ten minutes and that all results would be treated confidentially, and that the participants were to answer all questions as accurately as possible. After this general introduction, WIDM was introduced, so that participants who did not know the show could better understand what they were about to see and judge. Next, it was explained what the task would consist of. The instruction stated that the participants would first see a fragment that starts with a green screen, followed by the reaction of a person. Afterwards, they would have to judge the sincerity of the response of the person. It was explained that they would first answer some demographic questions about themselves, and then would get a more elaborate explanation about how they had to judge the fragments. The demographic questions were about their gender and age, after which the instruction about the task followed. The participants were told that they would have to answer three questions and one control question about whether they knew the season of the show or not, for each fragment. Lastly, it was stated that two example fragments would follow and that they could only watch every fragment once. One example fragment was of a candidate and one of a mole, but the participants did not know this. The three questions and control question were the same for the two practice fragments as for all 24 fragments that followed in the main part of the study. The first question was “The relief of this person looks sincere to me”, which the participants had to judge on a seven-point Likert scale ranging from one (totally agree) to seven (totally disagree). The second question, “I think

this person is expressive”, was answered in the same manner. The third question was a yes/no statement: “I think this person is the mole”. The control question, “Of this season, do you know which person is the mole?”, was also answered with *yes* or *no*. The control question was included to make sure that the participant had not already seen this season of the show, and therefore knew beforehand whether the person in the fragment was the mole or not (and thus sincere or not). All participants saw the 24 fragments in a different randomized order. At the end of the questionnaire the participants were thanked for their participation again.

Results

Since all participants judged all fragments in both conditions (genuine and non-genuine), the study had a within-subjects design. Therefore, two repeated measures ANOVAs were used to analyze the results. In the first one, the sincerity of the person in the fragment was the within-subjects factor with two levels: mole and candidate. In the second one, the expressiveness of the person was the factor with the same two levels as sincerity. The descriptives of these analyses can be found in Table 1.

Table 1: Mean scores (from a seven point scale) on sincerity and expressiveness of the moles and candidates (standard deviation between brackets)

	Sincerity	Expressiveness
Mole	4.61 (0.92)	3.96 (0.88)
Candidate	4.18 (0.83)	4.05 (0.77)

The results show that people judge moles’ and candidates’ sincerity differently ($F(1, 49) = 15.99, p < .001, \eta^2 = 0.25$). Moles ($M = 4.61, SE = 0.13, 95\% CI [4.35, 4.87]$) are seen as more sincere than candidates ($M = 4.18, SE = 0.12, 95\% CI [3.94, 4.41]$). No significant effect was found for the expressiveness of the moles and candidates ($F(1, 49) = 1.61, p = .21, \eta^2 = 0.03$). Moles ($M = 3.96, SE = 0.12, 95\% CI [3.71, 4.21]$) were not seen as more or less expressive than candidates ($M = 4.05, SE = 0.11, 95\% CI [3.83, 4.27]$).

Furthermore, a follow-up analysis was conducted in which the clips were compared. The scores on sincerity and expressiveness of each clip were averaged to find the most and least sincere and expressive mole and candidate. Table 2 gives the descriptives of these fragments. The best mole/candidate is defined as the one judged as the most sincere one, the worst mole/candidate was seen as the least sincere one.

Table 2: Mean scores (from a seven point scale) on sincerity and expressiveness of the most and least sincere and

expressive mole and candidate (standard deviation between brackets).

	Sincerity	Expressiveness
Best mole	5.90 (1.00)	5.37 (1.04)
Worst mole	3.40 (1.59)	2.47 (1.18)
Best candidate	5.13 (1.44)	4.96 (1.18)
Worst candidate	3.15 (1.51)	1.87 (0.96)

These figures show that the mole and candidate with the highest scores on expressiveness were also rated as the most sincere ones. Also, the mole and candidate that were judged as the least expressive were also seen as the least sincere.

Discussion

The research question that was investigated with this study was: to what extent can people distinguish genuine from non-genuine relief based on facial expressions, and does expressiveness play a role in this? The results confirmed the first hypothesis that people cannot distinguish genuine from non-genuine facial expressions. The participants were not able to distinguish genuine from non-genuine signs of relief. In fact, the opposite was found: moles (non-genuine) were seen as more sincere in comparison to candidates (genuine). This result confirms the earlier studies of Burgoon, Blair and Storm (2008), and Talwar and Lee (2002) that both found that participants could not differentiate lie-tellers from non-liars, based on their non-verbal behavior.

The opposite finding as opposed to the first hypothesis could be related to the expressiveness of the persons in the fragments. However, no significant difference for expressiveness was found between moles and candidates. This is in contradiction to the research of Talwar and Lee (2002), who found that lie-tellers showed more facial expressiveness than non-liars.

Based on the research of Tkalčić, Odić and Košir (2013), who found that highly expressive behavior leads to a feeling of a person not being genuine, the second hypothesis was that people who show high emotional facial expressiveness are not seen as sincere people. Nevertheless, this hypothesis was not confirmed by the results, since these showed that people who were seen as expressive, were rated as being more sincere. This might be the case because people see relief as an emotion that people are unable to hide if it is sincerely felt.

However, a few limitations of the current research need to be taken into account. There could be small differences in the expressions of the candidates at the beginning and the end of the season. Candidates and moles could become better at faking their expressions.

In this study, this has not been taken into account and fragments from various moments in the seasons of the show were used. Furthermore, since famous Dutch people take part in the show, some moles and candidates are actors. In that case, there is a good chance that they are better at faking expressions, than a person that is not an actor. Another remark concerning the famous candidates is that the participants might be judgmental about the candidates shown in the fragments. The participants might know the candidates and moles, and answer the questions based on their prior image of that particular person. This could influence the way participants judge the sincerity of the persons. For example, if a participant is not fond of a famous candidate of the program, he or she might answer that the relief is not genuine, while he or she was genuinely relieved.

Another limitation lies in the control question “I think this person is the mole”. It was included in this study to examine if participants were consequent in their answers. Giving a higher rating on sincerity would be accompanied by a *no* on the question “I think this person is the mole”. However, this has not been analyzed. This consideration has been made due to a lack of time and a preference for the conducted analyses. Future research should take this into account though.

Furthermore, only facial expressions were taken into account in this study. However, it might be the case that the overall body language also reveals information that can help detecting insincerity. Frank and Ekman (2004), for example, concluded from their research that not facial expressions, but other non-facial elements, like body and voice, are related to detecting deception/sincerity. Therefore, it might be interesting for future research to include body language in the study. Additionally, future research could include eye tracking to find out on what aspects the participants are focusing when they are judging the sincerity of someone’s emotions.

Conclusion

The aim of this study was to examine if people could distinguish genuine from non-genuine relief in facial expressions. Furthermore, the role of expressiveness was examined. This was investigated with a perception test in which the participants had to judge fragments of the elimination round of the television show WIDM. The results showed that non-genuine expressions of the moles were seen as more sincere in comparison to the genuine expressions of the candidates. Furthermore, no significant difference in expressiveness was found between moles and candidates. The follow-up analysis showed that expressive people (both moles and candidates) were

judged as more sincere than less expressive people. In future research, a few aspects can be taken into consideration, like the use of non-famous people in the fragments, and a consideration of more non-verbal behavior than facial expressions.

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