



Research Article

Understanding Facial Posture as a Means of Emotional Expression: A Case Study in the Light of Cognitive-Behavioural Therapy Approach

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Abstract

This case study is a partial replication of an original experiment by [Strack et al. \(1988\)](#). It examines the understanding of the facial feedback hypothesis. For this experiment, participants were asked to rate the funniness of a cartoon after completing tasks using only their lips or teeth to hold a pen, thereby facilitating a smile or a frown. In addition to that, there have been discussed cognitive-behavioural therapy elements on the presentation of emotions following physical reactions. It was a between-participants design in which respondents were asked to complete a questionnaire in the lips or teeth condition to generate emotional states of physical reaction required to underline cognitive precipitants. In this study, a within-participants correlational design was also conducted between extraversion and altruism to consider the possibility whether these two variables could relate to funniness or not. To test that, participants were asked to rate the humour of a far side cartoon. The results did not confirm the hypothesis that those in the teeth condition rated the cartoon funnier than those in the lips condition meaning that facial reaction does not necessarily imply respective emotional states due to cognitive elements, such as awareness and attention, which posit reason as a more important factor than emotions. Discussion of the results in line with physiological and cognitive aspects and their implications to future research had also been carried out.

Keywords: funniness; factual realisation; mere awareness; CBT.

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Emotion theory has been widely discussed in psychology, almost since the end of the 19th century. William James (1842-1910) and Carl Lange (1834-1900) were the first to write about emotions, interpreting them as inward representations of feelings against the exterior world. For instance, the *fear* a person experiences due to danger can lead to physical responses of shortness of breath, sweating, trembling, etc. Such physical responses, when examined, do not necessarily refer to fear itself, but to an interior reaction that makes humans demonstrate fear through physiological responses (comp. [Kish-Gephart et al., 2009](#)). For [James](#) (1884) and [Lange](#) (1887), the understanding of the sensory feedback is related to the expression of emotions. On the other hand, scientists such as [Schachter](#) (1964) thought of emotions as perceptions demonstrated not only through physiological responses, but also through cognitive properties. According to [Schachter's](#) interpretation, humans cannot feel or express their emotions, or their emotional states, if those have not been anticipated via physiological and/or perceptive causes. On a third account, emotions are understood as adaptive procedures to an environment for humans to survive (comp. [Al-Shawaf & Lewis, 2017](#)). Evolutionary theories have examined that understanding, not least [Plutchik's](#) structural and evolutionary psychological theory of emotion (1984); [Shaver's](#) prototype theory (1992); and [Frijda's](#) action tendencies (1988). The first examines emotions as a vital expression of the man's need to survive and prosper in life; the second, considers emotions as a behavioural repertory; whilst the third is referring to emotions as dispositions that apply to humans' alertness against the environment.

The facial feedback theory goes back to [Darwin \(1872, cited in Strack et al., 1988\)](#). It refers to an understanding of responses which come through the posture of face, when experiencing feelings such as joy, fear, happiness. For [Darwin \(ibid\)](#), facial feedback represents feelings and responses of a person in regard with further understanding of one's behaviour and reaction



within a given environment. An emotion estimated under intensified factors can be enhanced on the face of a person, whereas an emotion being repressed will be softened.

Laird (1974) suggested that every emotional experience refers to hedonic expressions, which are needed, for the emotions to be experienced and demonstrated. He also thought of the hedonic value of every emotion as something that is advanced through available affective stimuli and material. Finally, he spoke about specific values of hedonic demonstrations that reveal emotions which can be seen on the external characteristics of the body, such as the skin, the temperature, the skin conductive responses and in the blood volume.

Tourangeau and Ellsworth (1979) referred to physiological responses and changes that may be found in a person's organism. The physiological responses may or may not be responsible for the emotions. Tourangeau and Ellsworth considered this understanding by stating that facial activities do not necessarily reflect emotions, for example, a face with make-up or the winking of an eye. They talked about autonomic reactions which produce consequences not always related to an emotional feedback, or a genuine facial response.

Strack et al. (1988) conducted an experiment on facial feedback hypothesis to understand how emotions are experienced and under which circumstances they operate in the sensory status of humans. They conducted such an experiment so to show how through a facial stimulation procedure, emotions are externalised and reveal a person's inner state. Strack et al., (1988) to consider aspects related to the facial feedback hypothesis also examined the cognitive factor. The cognitive factor should be examined as a mediator towards the facial feedback understanding. The cognitive factor is a consideration which refers to motivational influences taking place within the feedback stimulus understanding. The cognitive mediator is closely linked to the facial feedback hypothesis for it affects humans through the physiological reaction of the organism. In that respect, the last part of the experiment was the response to the amusement rating of a cartoon. The last part of the experiment examines emotions or emotional states which can be stimulated by facial expressions (Laird, 1974). Emotional stimuli can be elicited by facial muscular activity. Emotional facial expressions improve the recall of hedonically consistent material (Laird et al., 1982). Facial feedback refers to emotional experience and evaluates emotional stimuli (Kraut, 1982).



Emotions are clearly understood through looking at gestures or postures of the human body. For instance, people can understand repression by observing the softening of feelings of a person (Darwin, 1872: cited in Strack et al., 1988). Emotions are depictions of psychological factors taking place in humans' mind. Emotions refer to genetic or environmental reasons and occur in a person's life by being applied through experiences that can cause them. Today, it is considered that emotions are closely connected with postures and gestures of the human body. In this context, emotions are understood as 'somatosenses' (Buskist et al., 2004), which depict the overall discernment of humans' inner and outer representations in the body. Such representations could be facial postures that provide understandings (cognitive consequences) about how a person's life could be influenced by events or other triggers. There could be for a multitude of reasons why facial occurrences relate to experiences one acquires in life, such as a car crash (trigger) and one holding one's face (behaviour) if a car hoots in an instance that a person is reminded (cognitive consequence) of the trigger once experienced. If one is unable to grasp and explore triggers, it may mean that experiences related to them could appear disconnected and not in line with their meanings when grasped by the human mind.

In terms of cognitive-behavioural therapy (CBT), emotions play an important role in identifying hidden cognitions (Fenn & Byrne, 2013). Cognitions to do that is via facial expressions and/or postures. In CBT terms, negative automated thinking is a kind of vicious circle between faulty appraisals and emotions leading to avoidant behaviours and the consequences of them (Williams & Garland, 2002). Not all incidents and/or events are regarded as triggers in CBT. The way these are understood and/or represented is via negative thoughts -generally, we name them as *cognitive distortions* or *biases* (otherwise called, *maladaptive appraisals*)¹- which introduce the demonstration of negative automated thoughts (Simmons & Griffiths, 2011). This paper, will also discuss the effect of emotional expression to cognition and vice versa. Cognitions can be demonstrated without emotional expressions in some human conditions. And emotive responses can again be indeed expressed without cognitions, in terms, for instance, of explanation or understanding. Though, the initial study by Strack et al. (1988) was about emotional responses expressed via facial postures, in this paper we will also discuss the understanding of the former, according to cognitive antecedents preceding it (Johnson, 2005).

¹ By *cognitive distortions* or *biases*, it is meant catastrophising, all-or-nothing thinking, over-generalisation, mental filter, disqualifying the positive, jumping to conclusions, magnification, or minimisation, etc. (Comp. Scott, 2013).



The rationale of this study is about the understanding of facial expressions in relation to the affective experience they produce. The hypothesis of this study will question whether facial grimaces could represent and measure emotional state in humans. At the same time, a question will be which cognitive factors come to the play between emotions and cognitions. Emotions are regarded in psychology as clear indications that associate cognitive factors to what humans feel as innermost expressions. The latter -the innermost expressions- appear also through physical sensations in the names of *jealousy*, *disgust*, *fear*, *anger*, *surprise*, *happiness* and *sadness*. Such emotions can appear in the physical state of humans via facial expressions, body language and tone of voice as well (comp. [Robinson et al., 2013](#); [Ekman, 2016](#)).

The current study will explore the theoretical rationale outlined above so to examine the understanding of emotions following a partial replication of the [Strack et al.'s \(1988\)](#) experiment. A relevant therefore experiment will be conducted which will attempt to provide support for the theory of *facial feedback hypothesis*. The only difference to the [Strack et al.'s \(1988\)](#) experiment will be that in our study will also be included considerations for discussion of *cognitive factors* associated to *emotional states* resulting from facial postures and expressions. The hypothesis of the facial feedback hypothesis will either be maintained or refuted through a procedure which will tackle the observation mentioned above. What is going to be measured through our study will be how facial expressions/postures can provide feedback by asking participants to rate the funniness of a cartoon. *The present research will be a case study which will therefore explore cognition as an antecedent and emotional response as consequence.*

Method & Procedure

Data were collected from 55 participants, of whom 50 were females and 5 males -invitation and rationale of the study went out via email to 100 participants; however, only just over 50% of them accepted it and took part in the study. It was a convenience sample mainly from personal contacts and colleagues to the experimenter. Diverse experiences of participants referred to different ethnic, demographic, and cultural backgrounds, being also inclusive to the selection criteria of the experimenter's personal contacts and colleagues. The reason for the above was to capture their differing starting points so as to ensure quality data. Age range was between 18 to 49 years old. Mean age of participants was 26.4 and age range 33.5.

A between-participants design was selected which was run under two conditions and not under three as the original experiment by [Strack et al. \(1988\)](#). Independent variable (IV) was the *lips* or *teeth* condition; dependent variable (DV) was the *subjective humour ratings to the cartoon*. Hypothesis was one-tailed predicting that significant difference will be found in one direction. Equipment used was a pen and a questionnaire with four tasks (Appendix A). The questionnaire was designed specifically for this study so to replicate the one employed in the [Strack et al.'s study \(1988\)](#) as well as a *Far Side Cartoon* (Appendix B) that was downloaded from google images. Due to Government's restrictions regarding Covid-19, social distancing was observed meaning that participants took part in this study via zoom conferencing. Finally, UK-GDPR regulation was also adhered to.

Almost half of participants (27) held the pen between their lips whereas the other half (28) between their teeth. They were sitting in front of a table whereupon the questionnaire was too. The independent variable was the *facial posture*, which referred to the way participants were going to hold the pen -either with their *lips* or *teeth*-, so emotions to be elicited and feedback to be understood from the occurrence of facial expression.

The experiment used the two different conditions to facilitate the facial expression of a *frown* or a *smile* -postures that would respond and assimilate the position of the face. Order of the study was as follows:

1. Participants drew a line between two capital letters (A→B).
2. Then, participants circled and underlined responses applying to their understanding of *extraversion* and *altruism* -correlational study was employed and the design was within-participants. Correlational design was chosen to consider whether the level of *extraversion* could affect the level of *altruism* and vice versa; whereas also to consider whether *funniness* as a variable could relate to *extraversion* and therefore communicational understanding as far as *altruism* could be concerned.
3. Finally, participants looked at a cartoon and rated it on a scale of 0-10 as to how *funny* that could had been by facilitating a *frowning* or a *smiling* facial posture. It was stated that participants would use either *lips* or *teeth* to facilitate the conduct of the experiment (Appendix C).

The experiment was conducted under the following process:

1. Participants sat before their computers facing the monitor via zoom conferencing having a table and keeping their backs on an upright position.
2. Participants were explained once more the purpose of the study, such as exploring different methods of writing using different parts of their body (Appendix D).
3. No mention of facial expressions or emotions were made -that was also part of the instruction participants were given.
4. Participants were asked to hold a pen with their *lips* or *teeth*. They were going to fill in the questionnaire which was distributed at the same time to them.
5. Having filled the questionnaire, they were asked to rate their amusement level from 0-10 by looking at a cartoon and thinking whether that looked funny or not (Appendix A, Task 4).

Results

SPSS was the statistical program that analysed the data extracted from this study. Participants answered the questionnaire and results that ensued from *amusement ratings* appeared as follows:

- a. No significant difference was found between the *lip* or *teeth* conditions, when participants rated the amusement/no amusement of the cartoon.
- b. Mean score for the *teeth* condition was 4.8; standard deviation (SD) was 2.2.
Mean score for the *lips* condition was 3.7; standard deviation (SD) was 2.6.
Mean score for both *lips* and *teeth* was 4.2; standard deviation was 2.4.

Table 1.
Descriptive Statistics

	Mean	Std. Deviation	N
Teeth condition	4.8	2.2	27
Lips condition	3.7	2.6	28
Both conditions	4.2	2.4	55

Table 2.
Descriptive Statistics

	Mean	Sample age 18-49	Age range	N
Males	22.8			5
Females	26.7			50
Both genders	24.7	26.4	33.5	

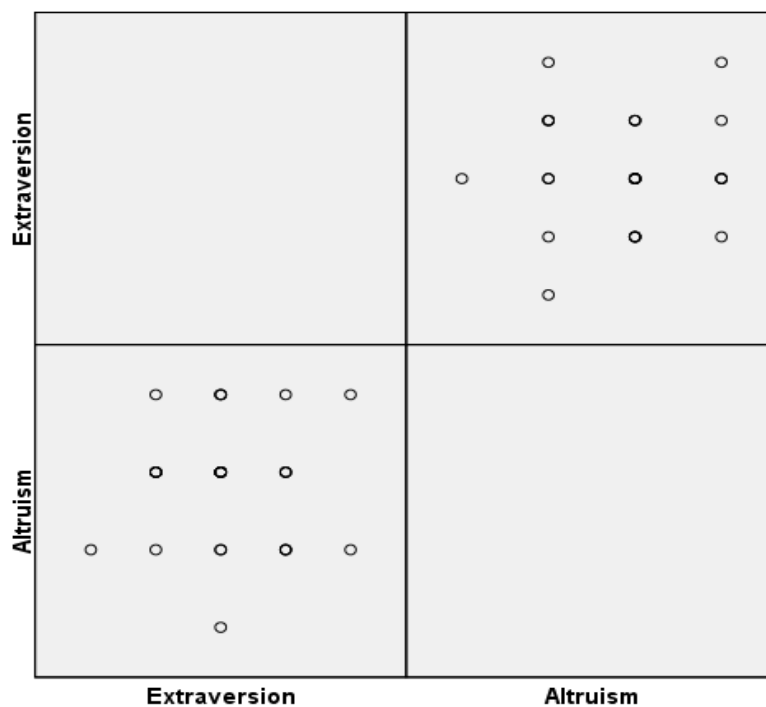


Table 3a.
Inferential Statistics

Extraversion/Altruism	Pearson's <i>r</i>	<i>df</i>	<i>p</i>	<i>N</i>
	.021	53	.458	55

Table 3b.
Inferential Statistics

Lips*Funniness Group	<i>F</i>	<i>df</i>	<i>p</i>	η^2
	1.8	4, 22	>0.1	.243
Teeth*Funniness Group	0.1	4, 23	≤0.1	.143



Digram1. *Correlations*

Discussion

In both conditions, females' means were higher compared to males. That took place because female participants' numbers were disproportionate to males (5 males, 50 females). The mean score therefore for each gender is 22.8 and 26.7 respectively; for both it was 24.7. Though males were misrepresented in numbers, not much difference in the means between them and

the females was detected (3.9). Age range between participants was 18 to 49 meaning there were no big gaps in the overall average of sample age as that was shown by the mean score of 26.4. Age range was 33.5 meaning that participants considered amusement ratings similarly on average. In studies, there has been found that positive attention and memory increase with age, and that due to the fact that a clearer understanding of stimuli needs to be in place for better resolution of adaptive challenges (comp. Carstensen and Lockenhoff, 2003; Oschsner et al., 2004).

In this study, amusement ratings did not confirm the facial feedback hypothesis, that was partially replicated. That is to say that positive understanding to facial posture as a means of emotional expression wasn't supported. An explanation to that could be that cognitive precipitants associated with emotional expression have played an important factor in the generation of relevant emotions. Such cognitive precipitants could be *factual realisation*², *mentalising* (Meltzoff & Decety, 2003; Engelmann & Pogosyan, 2013) or even *boredom*³ -as an order effect (comp. Shaughnessy et al., 2006)- for participants who had to hold a pen either between lips or teeth. That could mean that participants in the current partially replicated study did not experience elicitation of facial feedback resulting from emotional reaction; counter-supporting therefore that emotional gesture following funniness is not an outcome when *reading* a cartoon. Emotional reactions did not occur in terms of differences between *reading* and *watching* a cartoon. *Reading* a cartoon could associate more to the fact that a deeper understanding is needed to elicit *awareness* of the stimulus provided, i.e., the presentation of a funny sketch. *Watching* a cartoon could mean that one's vision is mainly associated to the grimaces of inanimate faces 'playing' in that cartoon. As it seems, grimaces were not the case for participants that is why funniness wasn't elicited. On the contrary, what seemed to have been observed in participants' understanding was that even a *mere awareness* of the word-content of the cartoon was more than enough to reduce the possibility of 'seeing' funniness in it. In saying that, it could mean that *mere awareness* could suffice for emotions not to be elicited if one's experience decides that there is nothing in need of an emotion to be invoked, proving

² In the understanding of *felt reality* approached through the senses. In this study, *reality* elicited through the task was *virtual* meaning that *factual realisation* was low and therefore reducible as far as *perceptible effort* was concerned, for it was *inanimate* and not *animate*. What the latter explanation about *perceptible effort* against *animate* and *inanimate* objects outlines is that *representation* and *representational context* is minimised within its *causal framework* in terms of *content naturalisation*, i.e. *felt reality been lacking when factual realisation is absent* (comp. Dilworth, 2010).

³ "...boredom is consistently related to negative affect, task-unrelated thought, over-estimation of elapsed time, reduced agency, as well as to over- and under-stimulation" (Raffaelli et al., 2017, p. 1).



thereby the cognitive-behavioural therapeutic hallmark that *cognitions indeed generate emotional reactions and not the other way around* (comp. Beck et al., 1979)⁴. A possible consideration could be that gender participation did not advocate to the emotional understanding between different sexes. In other words, results could be more accurate if there were to be an average gender score closer to the age range of the respondents that have taken place in the study, i.e., instead of 18-49 to have been 18-25 or 30-40 or similarly else. Age of participants could seem more likely to support better mean scores taken from amusement ratings so to better support the facial feedback hypothesis. In addition, the cognitive understanding in relation to emotions could be regarded an equally important factor in such kind of research so that facial posture and physiological responses of the body to be examined under mental processing concomitants (Zuckerman et al. 1981).

A question that is also raised is whether emotions are influenced by facial expressions alone. That is to say, how important would be to consider the facial feedback hypothesis in relation not only to human emotions but to cognitions as well? Or, how accurate would be an understanding about emotions and cognitions resulting from such an experiment? This has been an enquiry under test by many scientists (Buskist et al. 2004). The latter means, there cannot be a facial feedback without a facial posture; whilst the former, there could exist and/or emerge emotions, feelings (physical sensations) and cognitions as a consequence of manipulated experimental conditions, questioning whether such studies are able to provide us with important findings. Procedures as the one we have followed in the present study offer a general representation of facial reactions in association to emotional and cognitive prerequisites, however minimal as to findings incorporating cognitive processes. Manipulated experimental conditions refer to independent variables that may vary in tracking down emotional and cognitive understandings to the facial feedback hypothesis and/or constructing a theory that could support the initial idea of the facial posture assumption.

The question about the hypothesis that was tested related also to the appearance of muscular reaction. In other words, the understanding of the facial feedback theory was regarded in association to facial muscles activation so to comprehend the posture of the face and the emotions and cognitions expressing it. The more the muscular activation, the more the affective and cognitive state on the face of an individual enabling hypotheses, as in the current study, to

⁴ "When cognition or behavior is modulated, success is often evaluated in terms of the positive impact on emotions" (Keegan & Holas, 2010, p. 613).



associate with the rationale of the initial observation made by [Strack et al. \(1988\)](#). The initial question argued that the facial feedback hypothesis may support the theory of the facial posture via emotional expression. Emotional expression seems to be bound with cognitive agents that enable facial postures of *emotional interpretation* or *manipulation* through the mind; however, in the paper by [Strack et al. \(1988\)](#), the latter is not discussed clearly so to understand what is the *emotional interpretation* or *manipulation* that involves cognitive agents, and which are these, or which parts of cognition of the human mind could be included. Perhaps, an explanation to that could be that *manipulation* referred to was only experimental and not a cognitive one, meaning that relevant cognitive states, such as *perception*, *attention*, *decision-making* or *intentionality* resulting to emotional expression, weren't tested in comparison to the amusement task. To the same extent, the understanding of *emotional interpretation* wasn't clear as well: it hasn't been discussed in view to cognitive parameters, such as a *holistic style approach where tasks are regarded according to a broader perspective rather than the one, they are presented by*, that may be associated to them⁵.

On the other hand, *extraversion* and *altruism* have exhibited similar graphs in the results. There weren't big changes as far as the direction of association between the two would be concerned. The fact that this correlation is positive, regardless of the point showing it as weak (.021), it may mean that extroverts could somehow be altruists and/or vice versa (comp. [Glomb et al., 2011](#); [Furnham et al., 2014](#)). The relationship between *extraversion* and *altruism* is positive but weak, meaning also that even *weak rise of extraversion may present a weak rise in altruism*. The same applies to the probability value of .458 which is closer to less than .005. The reason for that weakness could lie to the fact that questionnaires for both *extraversion* and *altruism* consisted of statements of *reduced extraversion* (items 1st, 3rd, and 4th) and *reduced altruism* (items 3rd, 4th, and 5th) in which participants have scored 'agree'. That could mean that the idea of *funniness* could be of a reduced sense too in terms of people who keep themselves to themselves (*with reduced or no extraversion*) or do not exercise *openness to new experiences* or *communicative interaction* with others getting to know them better in view to problems others

⁵ An example of that in the paper is when the authors outline that: "...it is possible that subjects may have used cognitive strategies to support the required facial expressions. For example, they may have directed their attention away from the emotional stimulus in an effort to suppress their expression of the emotion elicited by it. Correspondingly, they may have intentionally increased the emotional intensity of their thoughts about the stimulus in order to generate the appropriate emotional expression. Such cognitive mechanisms may have contributed to observed emotional responses" (pp. 769-770). In the abstract of their study (p. 768), the authors are making a bold statement that "...findings... also showed that facial feedback operates on the affective but not on the cognitive component of the humour response", which somehow supports the findings of our study that cognitive factors are important variants for the facial feedback hypothesis to be further developed.



might be experiencing (*with reduced or no altruism*). *Extraversion* and *altruism* seem to be positively associated to each other, even in a minimal correlation in this experiment, something that the literature is commenting on as well (Oda et al., 2014), outlining that the more someone is extrovert the less or reduced exhibition of altruistic manners to others could be demonstrated (Ben-Ner & Kramer, 2011).

As now for the easy/extremely difficult task in rating the *funniness* of the cartoon participants were shown for both the *lips* and *teeth* conditions, variation of the scores accounted for *funniness* was 24.3% on *lips* and 14.3% on *teeth* following the one-way independent Anova design. That meant that participants either on the *lips* or *teeth* conditions did not find the cartoon funny when they were presented with it -*percentage on funniness*, in other words, *had been low*. There was little difference between the *lips* and *teeth* conditions and *funniness*: in the *lips* condition, *funniness* was regarded *statistically insignificant* [$p > 0.1$ (1.8)]; in the *teeth* condition, *funniness* was regarded *statistically significant* [$p \leq 0.1$ (0.1)]. In both *lips* and *teeth* conditions and *funniness*, facial expression did not yield amusement to the cartoon. That could assume either that cartoons may not look so funny because they have to do with inanimate depictions of amusement or because they are not presented with a clear point or reference, such as a moral that could derive from it. In line to the latter, cartoons that may have a point of importance, i.e., a didactic perspective, could mean more to the recipient than a simple joke. To such an extent, and if we were to regard the *funniness of a cartoon* in terms of meaning and context, we could assume that funniness as a response to an external trigger could indicate *extraversion* also to those who associate it with *externalisation* of an emotion the foundation of which may derive from cognitive artifacts, such as the ones we discussed above (*perception, attention, decision-making* or *intentionality*) as far as the current understanding of reality is concerned. In a continuum with that, *altruism* may be regarded as an *act of positive response to extraversion* that encapsulates the importance of accepting others in view to their problems and/or what they have to offer. In other words, *funniness* or *no funniness* in the above context may indicate degrees of *extraversion (moving towards)* and *altruism (recognition)* by the recipient to the creator of the cartoon who spend some good time to prepare it, draw it and present it to the public. *Moving towards* and *recognition* could therefore be or could become factors within which *extraversion* and *altruism* appear as *behavioural activation orientations* unto meeting with others and interacting with them.

In such a study, or in a similar one, cognitive intercessions are certainly involved without which no emotional expression can take place. It is also relevant that a cognitive understanding to such participation to an experiment would incur other factors, like the performance of respondents to refer to the guidelines presented to them before taking part in this study. The latter means that the factor of 'pleasing the experimenter' could also be feasible engaging participants with cognitions such as *compliance -adhering to a thought process that is relevant to requests and/or directions 'asked' by someone else*: the so-called principle of *ingratiation* towards the experimenter (Smith et al., 1982). It is perhaps true that cognitive coefficients, such as *self-efficacy judgment* and *performance-related criticism*, will be concurrent factors and states of cognitive intercessions to studies like the present one (comp. Fakehy, 2013). Psychologists are on the course of testing the above considerations, for as far as the cognitive procurance is concerned, the facial feedback hypothesis seems to be influenced by cognitive factors as the above, as well as the postures and muscular activations being dependent upon (Izard, 1993; Kaiser & Davey, 2017).

Potential applicability of findings

The findings show that facial postures, expressions, or grimaces, outline emotional reactions following cues from the environment that derive from events or situations. At the same time, emotional expression to be observed, there needs to be related with cognitive precipitants, such as *mere awareness*, as in the present study, which in cognitive-behavioural therapy terms explained the fact why the direction of this correlational analysis's results hasn't been much inviting as to the task with the cartoon.

Though, correlational analysis hasn't demonstrated a strong association to the comparability between the variables of this study, it nevertheless appears that the findings of it do exhibit a potential applicability for present-day research. That means that facial postures, following relevant environmental cues, to be able to be expressed, there is a need for other factors to come to the fore, such as *emotive reactions based on social influence behaviours*, like the ones addressed through the trends of *extraversion* and *altruism*. In such respect, it could be assumed that one to develop a specific facial grimace is not necessarily important to adhere to environmental cues but to social constructs associated with such cues, as are *altruism* and *extraversion*, through the mere awareness of which, events and/or situations could be better



cognitively explained as well as emotively observed. In cognitive-behavioural therapy terms, that could also be of importance in view to incorporating the application of psychoeducation in the understanding of emotive reactions associated with social influence behaviours.

Practical implications and suggestions for further research

In line with the above, potential practical benefits of furthering this type of research could be including other variables as well, such as *introversion* and *neuroticism* to investigate the importance of them in the presentation of altruism as well as what emotive reactions could these bring. A research question in respect with that could be: What altruism could look like if it was to be observed in people who express neuroticism and/or introversion, instead of extraversion?

The next consideration to the latter would be to think whether the results of this study could also be affected by the introduction of *introversion* and *neuroticism*. In other words, could that affect the finding of *mere awareness* and to what extent? Or could a correlational analysis have a negative association and in what respect? If questions like these could be answered, it could demonstrate that potential practical benefits of such a research could further the understanding of cognitive precipitants in emotional reaction with regards to *self-efficacy in human interrelationships*, *self-consciousness in terms of psychosocial development*, or *temporal and spatial presence at the time an event or situation is taking place*. i.e., an extension of the *mere awareness* finding of the present study. In cognitive-behavioural therapy terms what could as well be important to be discussed would be how the traits of introversion and neuroticism as cognitive appraisals might possibly affect the presentation of reality in one's mind in relevance to events and/or situations.

Strengths of the present research

1. Facial and emotional expressions can support the facial feedback hypothesis when explored in terms of cognitive precipitants.
2. Decisions and activities people are involved to are not considered aloof of cognitive antecedents.
3. CBT (cognitive-behavioural therapy) offers us the tools for a better consideration and understanding of the cognitive properties of human mind.
4. Facial muscular reaction is regarded as a behaviour resulting from cognitive imperatives.
5. Cognitive reactions based on emotions are subject to cognitions governing emotions.

Shortcomings of the present research

1. A pilot study for both questionnaires of extraversion and altruism could have been conducted prior to the main study to consider which items to keep and which to discard.
2. Extraversion and altruism questionnaires could be extended to include all Big 5 personality traits, such as neuroticism, conscientiousness, agreeableness, and openness - the fifth one is extraversion (comp. [Costa & McCrae, 1992](#)).
3. Using a larger number of participants could probably provide a better dispersion of results as to the cognitive precedence of emotional expressions.
4. Q-methodology could also be used as both a quantitative -numbers- and qualitative -statements/narratives- inquiry in this study to encapsulate the philosophy, ontology, and epistemology behind facial feedback hypothesis, in terms of implicit sequential learning (the repetition of letters/works/images and participants' emotional reactions following them), manipulation of emotions (the nature of felt emotions in representing pleasure and pain) and action coding systems (taxonomy of facial movements by their appearance on the face) (comp. [Bermeitinger et al., 2013](#); [Ekman et al., 2002](#); [Hjortsjö, 1969](#)).
5. MANOVA design could also be applied into considering cognitive factors able to affect extraversion and altruism. Extraversion and altruism could be employed as DVs so by running post-hoc analyses to see whether cognitive factors as IVs affect them or not.

Conclusion

The facial feedback hypothesis refers to the understanding of emotions through postures of the face. Nowadays, it is suggested that facial manipulation can produce emotional outcomes that may refer to happiness or sadness (comp. [Knutson, 1996](#); [Magerkurth, 2005](#)). What is currently however questioned is whether face manipulation could elicit emotions and cognitions as complete as the above hypothesis seeks to confirm (comp. [Isen, 2001](#)). To support the latter, psychologists examine how cognitive coefficient factors could be related to emotions produced. Cognitive factors towards a deeper understanding of the facial feedback hypothesis seem to direct such an enterprise (comp. [Oatley & Johnson-Laird, 2014](#)).

Facial feedback hypothesis has not clearly included cognitive properties in the understanding of emotional expression and behaviour. When people are subjected to tasks showing facial muscular reaction, the question that is posited is whether emotional artifacts derive from

cognitions or physical sensations. In this study, we have suggested that emotional artifacts aren't produced on their own or aren't the outcome of physical sensations or that cannot be self-explanatory if cognitive precursors aren't taken into consideration. It is hoped that future research is going to further explore the cognitive mediation of emotional expression when muscular activity takes place, so the association between cognitions and emotions to be further explored in the facial feedback hypothesis.

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Appendices

Appendix A (4 Tasks)

Task 1

Male/female.....

Age.....

You may have seen pictures of people with physical impairments using their mouth to write or use the telephone. For them, the quality of their future life is greatly dependent on whether they can continue to exercise control over their environment by being able to perform basic tasks by themselves.

For social science and other researchers there are additional concerns: respondents who cannot complete rating scales with their hands because they have a physical impairment, are usually excluded from studies -this may, of course, bias the findings. This study will investigate which response scales are most suited to people with physical impairments. The tasks that you will perform in this study are a sample of a much larger range of tasks and they will use alternative ways of filling out responses to different aspects of psychological functioning.

For each of the tasks, please keep the pen/pencil in the instructed position until you have completed the task

First complete the practice task

Draw a line between points A and B while holding the pen/pencil in the instructed manner.

A

B

Task 2 (Extraversion questionnaire)

Please, answer the following questions by circling 'agree', 'disagree' or 'not sure'



- | | | | |
|---|-------|----------|-------------------|
| - I am inclined to be slow and deliberate in my actions | Agree | Disagree | Not sure |
| - I am generally very enthusiastic about starting a new project | Agree | Disagree | Not sure |
| - Generally, I prefer reading to meeting people | Agree | Disagree | Not sure |
| - I seldom stop to analyse my thoughts | | Agree | Disagree Not sure |
| - I am inclined to be over-conscientious | Agree | Disagree | Not sure |

Please, cross through the rating score number that indicates the level of difficulty experienced in completing this extraversion questionnaire.

0 1 2 3 4 5 6 7 8 9 10

Easy Extremely difficult

Task 3 (Altruism questionnaire)

Please, answer the following questions by circling 'agree', 'disagree' or 'not sure'

- | | | | |
|--|-------|----------|----------|
| - I give generously to charitable appeals | Agree | Disagree | Not sure |
| - I usually stand back and let others go first onto a bus, train, or plane | Agree | Disagree | Not sure |
| - I find choosing gifts difficult and tedious | Agree | Disagree | Not sure |
| - I believe it is generally a mistake to lend money to friends | Agree | Disagree | Not sure |
| - I would be reluctant to invite a boring, but lonely person to a meal | Agree | Disagree | Not sure |

Please, cross through the rating score number that indicates the level of difficulty experienced in completing this altruism questionnaire.

0 1 2 3 4 5 6 7 8 9 10

Easy Extremely difficult

Task 4 (Stimuli rating task)

A picture will be shown on the monitor. Please, indicate your response by ticking the rating score.

Question 1

How funny do you think the cartoon is if you apply an 'objective standard'?

0 1 2 3 4 5 6 7 8 9 10

Not funny Extremely funny

Question 2

How did you feel when you looked at the cartoon?

0 1 2 3 4 5 6 7 8 9 10

Not amused

Very amused

Question 3

Please cross through the rating score a number that indicates the level of difficulty experienced in completing this rating task.

0 1 2 3 4 5 6 7 8 9 10
 Easy Extremely difficult

Appendix B



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Appendix C

Instructions:

1. For each of the tasks please keep the pen/pencil in the instructed position until you have completed the task.
2. Draw a line between points A and B, while holding the pen/pencil in the instructed manner.
3. Please, answer the following questions by **circling** 'agree', 'disagree' or 'not sure'.
4. Please, cross through the rating score number that indicates the level of difficulty experienced in completing this questionnaire.
5. Please, answer the following questions by **underlining** 'agree', 'disagree' or 'not sure'.
6. Please, cross through the rating score number that indicates the level of difficulty experienced in completing this questionnaire.

7. A picture will be shown on the monitor of your screen. Please, indicate your response by **ticking** the rating score.
8. Question 1:
How funny do you think the cartoon is if you apply an 'objective' standard?
9. Question 2:
How did you feel when you looked at the cartoon?
10. Please, cross through the rating score number that indicates the level of difficulty experienced in completing this rating task

Appendix D

Lips Data		Age		Teeth Data		Age	
Lips	4	39	Female	Teeth	2	45	Female
Lips	3	21	Male	Teeth	6	38	Female
Lips	10	26	Male	Teeth	6	29	Female
Lips	3	29	Female	Teeth	3	29	Female
Lips	8	22	Female	Teeth	7	35	Female
Lips	3	38	Female	Teeth	6	18	Female
Lips	1	23	Female	Teeth	4	19	Female
Lips	3	20	Female	Teeth	3	21	Female
Lips	5	18	Female	Teeth	9	19	Female
Lips	1	20	Female	Teeth	5	26	Female
Lips	4	18	Female	Teeth	3	20	Female
Lips	4	18	Female	Teeth	6	22	Female
Lips	3	18	Female	Teeth	5	19	Female
Lips	5	19	Female	Teeth	3	49	Female
Lips	9	22	Male	Teeth	6	27	Female
Lips	2	26	Female	Teeth	7	19	Female
Lips	6	21	Male	Teeth	7	19	Female
Lips	0	31	Female	Teeth	9	19	Female
Lips	2	35	Female	Teeth	2	20	Female
Lips	1	44	Female	Teeth	1	20	Female
Lips	1	37	Female	Teeth	6	24	Male
Lips	4	22	Female	Teeth	2	19	Female
Lips	0	41	Female	Teeth	8	18	Female
Lips	1	42	Female	Teeth	6	20	Female
Lips	6	49	Female	Teeth	4	21	Female
Lips	7	27	Female	Teeth	4	36	Female
Lips	6	40	Female	Teeth	4	20	Female
				Teeth	1	35	Female

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Dr. George Varvatsoulis is a chartered psychologist working as a CBT (cognitive-behavioural therapy) practitioner and supervisor. He is also an EMDR (eye-movement desensitisation & reprocessing) practitioner and an applied psychology and IAPT (improving access to psychological therapies) supervisor. He has published 70 papers in peer-reviewed journals and 4 books. His research interests are: pastoral & practical theology, psychology of religion, evolutionary psychology, and CBT.

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