Research Seminar in Social Neuroscience

Research Proposal Motivation

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Do Unconscious Approachable Stimuli Facilitate Effort Compared To Unconscious Avoidant Stimuli?

Introduction

In this report, the difference between unconscious approachable and unconscious avoidant stimuli and their application in a button-pressing task will be discussed. The goal of this button-pressing task is to find out whether the stimuli that are presented to the participants will have a positive or a negative effect on their performance. First, the literature that supports this study will be discussed. Then the details of the study itself and the predicted outcomes will be explained.

Introduction to the field and research question

A difference between unconscious and conscious stimuli needs to be made. A study performed by Pessiglione et al., (2007) suggests that even when reward cues are perceived subliminal (unconscious), humans can still put in effort as a response to these signalling reward cues. Even though both conscious and unconscious reward cues increase effort to work on a task, Bijleveld, Custers, & Aarts (2010) found that for unconscious rewards the speed at which a task was performed increased when a reward was higher however accuracy for the task remained the same. In contrast to when conscious reward cues are higher, participants were more accurate but also slower.

Moreover, a distinction between approachable and avoidant stimuli is necessary. According to Carver and Harmon-Jones (2009), the appetitive and aversive motivational systems represent core elements in the organization of behavior. The appetitive system organizes behavior involved in approaching desired stimuli (rewards, goals). The aversive system organizes behavior involved in avoiding punishments. A study by Adams and Kleck (2005) shows that joyous faces stimulate the appetitive system and sad faces stimulate the aversive system.

Just like how the computer plays an important part in our daily lives, emoticons and smileys play an important part in communication (Lohmann et al., 2017). For this reason, smileys might be used to encode approachable and avoidant feedback. Smileys can be as effective as human faces in bringing over the same emotion, in the sense of 'emotional contagion' as is also found in a study by Walther and D'Addario (2001). Therefore, these

smileys will elicit approach-avoidance behavior in the same way that human faces do. A study by Lohmann, Pyka and Zanger (2017) examined the effect of 'happy' and 'sad' smileys on the emotions of participants. They found that the smileys used affect the emotional state of the participant. However, they also found that for the 'happy' smileys there was not an increase in feeling 'joy' as was expected. This might be due to the fact that they used a social comparison to induce emotional contagion, in general people do not become happier by watching someone else being happy.

For this proposal, we wanted to combine these findings into one study. We wanted to find out how unconscious and conscious stimuli affect motivation. Previous research shows that happy 'approachable' emoticons affect motivation differently than sad 'avoidant' emoticons do. These findings led to the research question for this proposal: Do unconscious approachable stimuli facilitate effort compared to unconscious avoidant stimuli?

Study design and methodology

In this study, 90 participants will take part divided over 3 conditions. 50 repetitions per condition in a between-subjects design. Each participant will only do one condition.

The participants will be working in individual sessions on a computer and perform a button-pressing task. The participants will learn that they have to press either the left or the right button.

The task consists of a screen that shows an even or odd number. If an odd number is shown the participants have to press the left button. When an even number is on the screen the right button has to be pressed. After the participants have pressed the button a premask for the smiley appears for 400 ms. Then a happy or sad smiley face appears for 24 ms (Dehaene et al., 1998). After that, a postmask comes on the screen for 400 ms. The smiley will appear as a reaction to pressing the button. The happy smiley is only presented in the approachable condition and the sad smiley is only presented in the avoidant condition. For the control condition, no unconscious stimuli are presented during the task. After the smiley has appeared the screen will turn black for 1000 ms.
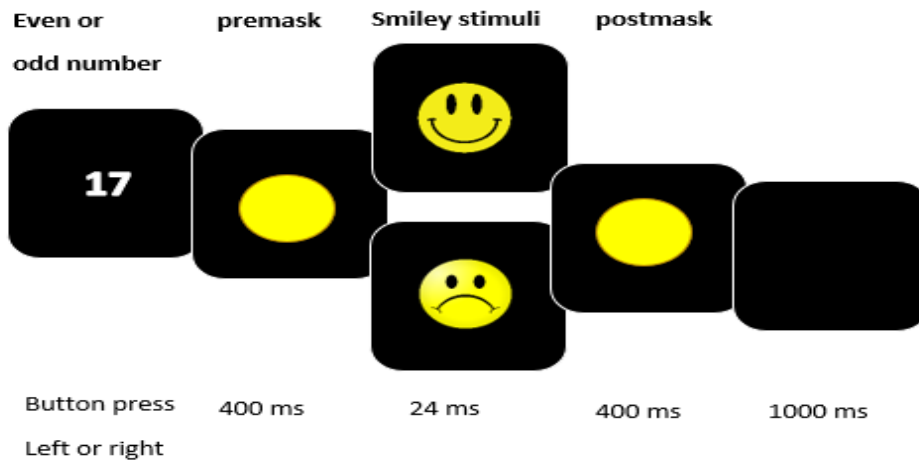
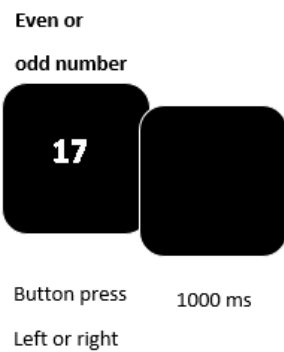Figure.1. The course of a trial for the approach and avoidant conditions.

Figure.2. The course of a trial for the control condition.

Conclusion

Based on the research of Bijleveld, Custers and Aarts (2010) we would predict that the group with unconscious approachable feedback will be faster in pressing the correct button. We believe we might even be able to say that it increases accurateness since the manipulation is different in our proposal. It might be interesting to see whether unconscious approachable feedback has the same influence as an unconscious high reward.

We believe our manipulation of approachable and avoidant feedback, by using 'happy' and 'sad' smileys respectively, will be effective based on research by Lohmann, Pyka and

Zanger (2017) and Adams and Kleck (2005). Since we do not use social comparison to induce the emotional contagion of the smileys, we believe that the approachable feedback will have a positive influence on the participant.

We would as well expect a feedback negativity response for the group in which the avoidant sad smileys are shown. When this group performs the task right and expects to give the correct answers and then perceive a sad face, this feedback is incongruent with their response. This incongruent feedback thus leads to a smaller feedback negativity, thus a smaller negative-going ERP, than can be seen in the group in which the approachable happy smileys are shown (Yeung, Holroyd, & Cohen, 2004, p. 539).

The consequences of this outcome would be that by using unconscious approachable feedback, the performance of participants will be faster if not more accurate than in the other conditions. Since we do not use a reward per se, for example, the participant needs to answer 3/4th of the task correctly, we only use the approachable feedback as manipulation. In this way we are able to say that by using unconscious approachable feedback as its only manipulation, the participant is influenced only by this feedback and thus performs differently than without this feedback.

References

Adams, R. B., Ambady, N., Macrae, C. N., & Kleck, R. E. (2006). Emotional expressions
      forecast approach-avoidance behavior. Motivation and emotion, 30(2), 177-186.

Bijleveld, E., Custers, R., & Aarts, H. (2010). Unconscious reward cues increase invested
      effort, but do not change speed–accuracy tradeoffs. Cognition, 115(2), 330–335.
      https://doi.org/10.1016/j.cognition.2009.12.012

Carver, C. S., & Harmon-Jones, E. (2009). Anger is an approach-related affect: evidence and
      implications. Psychological bulletin, 135(2), 183.

Dehaene, S., Naccache, L., Le Clec'H, G., Koechlin, E., Mueller, M., Dehaene-Lambertz, G.,
      … Le Bihan, D. (1998). Imaging unconscious semantic priming. Nature, 395(6702),
      597–600. https://doi.org/10.1038/26967

Lohmann, K., Pyka, S.S., Zanger, C. (2017). The effects of smileys on receivers' emotions.
      Journal of Consumer Marketing, 34(6), 489-495.
      https://doi.org/10.1108/JCM-02-2017-2120.

Pessiglione, M., Schmidt, L., Draganski, B., Kalisch, R., Lau, H., Dolan, R. J., & Frith, C. D.
      (2007). How the Brain Translates Money into Force: A Neuroimaging Study of
      Subliminal Motivation. Science, 316(5826), 904–906.
      https://doi.org/10.1126/science.1140459

Walther, J.B. and D'Addario, K.P. (2001). The impacts of emoticons on
      message interpretation in computer-mediated communication. Social Science
      Computer Review, 19(3), 324-347.
      https://doi-org.proxy.library.uu.nl/10.1177/089443930101900307

Yeung, N., Holroyd, C. B., & Cohen, J. D. (2004). ERP Correlates of Feedback and Reward
      Processing in the Presence and Absence of Response Choice. Cerebral Cortex, 15(5),