

# [The relationship between extroversion and physiological measures psychology essay...](https://assignbuster.com/the-relationship-between-extroversion-and-physiological-measures-psychology-essay/)

There has been a substantial research into the relationship between how extroverted an individual is and their physiological measures (Eysenck, 1967, cited in Martin, Carlson, & Buskist, 2007). Many studies have been carried out across the world to investigate this relationship and how environment and genetics can contribute to extroversion within individuals. The present study looked at the relationship between extraversion and physiological measures in Psychology undergraduate students in the UK. No significant correlation was found between extroversion and heart rate or extroversion and galvanic skin response.

The relationship between extroversion and physiological measures in university students

There has been much research into the relationship between arousal in response to a number of different tasks in both introverts and extroverts. Eysenck (1967) (cited in Martin, Carlson, & Buskist, 2007) suggested extroversion is a reflection of the state we do not show within our central nervous system (CNS). He stated that happiness and sociability were two of the main traits associated with extroversion. In a study investigating happiness and extroversion in undergraduate students, it was found that the two were significantly correlated. These differences support the idea that introverts are different to extroverts in that extroverts seek out more stimulating environments. The present study set out to investigate further into this idea by looking at the relationship between extroversion and physiological measures in Psychology students at a university in the UK.

Studies into the origins of extroversion within an individual have been widely conducted to understand why a person may be so extroverted or introverted; heritability seems to play a large contributing factor. In a study comparing monozygotic twins and dizygotic twins, monozygotic twins were shown to give the most alike results with 70% of the twins tested, being similarly extrovert (Zuckerman, 1991, cited in Martin, Carlson, & Buskist, 2007). This study does not support the idea that extroverts are affected by their environment unlike most research into extroversion, it simply states that genetics are the cause.

Similar studies to this report have supported previous research like into whether biological factors differ within introverts and extroverts. A study into physiological measures and extroversion was carried out in Singapore where the results showed lower extroversion scores were correlated with heightened cardiovascular reactivity while higher extroversion scores were correlated with lower cardiovascular reactivity. The study also found that higher extroversion was linked to lower cardiovascular reactivity during stress tasks and seemed to affect how individuals express and cope with anger (Jonassaint et al., 2009). This study helps to support the notion that Eysenck proposed which says that introverts are more likely to feel uncomfortable in a stimulating situation, in this case cardiovascular activity, whereas extroverts are more likely to enjoy and seek out such environments. Heart rate and skin responses have also been significantly associated with male students performing a visual vigilance task who were measured on the Eysenck personality inventory as introverts (Gange, Geen, & Harkins, 1979).

Research has also found differences in the brain between extroverts and introverts. In a study looking into whether there is a correlation between extroversion and blood flow when smelling unpleasant and pleasant odours, the part of the brain known as the amygdala in the temporal lobe, was strongly correlated with cerebral blood flow and higher extroversion scores when exposed to the pleasant odour (Vaidya et al., 2007). This piece of research supports the idea that extroverts are genetically different to introverts as they enjoyed the experience of the pleasant odour more than introverts did and their brain activation within the temporal lobe further supported this idea.

Other studies have further supported how the environment, not genetics, may affect both introverts and extroverts and how they react differently. In a study investigating the effect of background music and noise on completing tasks in introverts and extroverts, it was found that introverts performed better overall on each task except one, and introverts appeared to be more affected by the presence of everyday music and noise than extroverts. (Cassidy & MacDonald, 2007). Introverts are also more likely to respond more quickly to louder noise bursts than extroverts who tend to respond equally rapidly to varying noise intensities (Britt & Blumenthal, 1991). These studies supports Eysenck′s theory, which says that people whose brains are over-aroused, will find stimulating situations uncomfortable, and they will seek out quieter environments.

Although this idea seems to be strongly supported, a study which researched Eysenck’s (1953) hypothesis of a relationship between extraversion and sympathetic nervous system activity used 42 undergraduate students and the outcome was not quite the same. These students were exposed to fear arousing conditions and their heart rate and galvanic skin response (GVR) were measured during this time (Small, 1976). Although you would expect a relationship, no significant correlation was found. This piece of research disconfirms Eysenck′s hypothesis and this may be due to individual differences. In other words, maybe some extroverts are not under aroused and are actually over aroused, or maybe Eysenck′s personality questionnaire is not as accurate in its outcomes as we may think when measuring personality.

Although studies have been conducted in this area of research, the piece of research in this report was carried out to further provide support for this area of study. The relationship between extraversion and physiological measures was tested on Psychology undergraduate students at a university in the UK. It used a questionnaire designed to measure extroversion within an individual and a short maths test which was provided to cause the participants CNS to go into a state of high arousal. Based on previous findings, the hypotheses were that there would be a strong negative correlation between extroversion and heart rate and a strong negative correlation between extroversion and galvanic skin response.

Method

Participants

Participants were 167 psychology students aged 18-65 studying at the University of Chester in Cheshire. The measures were taken from the sex ratio 1: 4 males: females and the study used a stratified sampling method. Participants were treated in accordance with BPS guidelines and informed consent was obtained from each participant before taking part.

Materials and apparatus

The materials used included record sheets to write down the results for each participant, the maths task comprising of ten questions, rising in difficulty, using +,-, x and / operators, the Biopac (Biopac MP30 unit) with elecrodes (SS2L and SS3L leads to measure heart rate and GSR), the EPQ consisting of 23 questions which was filled out before the physiological measures were measured and a stopwatch to time each participant for 3 minutes completing the maths task.

Procedure

After initially consenting to take part in the research, students were given a 23 item questionnaire to complete, designed to measure how extroverted they are as people. Once completed, students were attached to BIOPAC consisting of electrodes being attached to the wrist, fingers and ankles which measured galvanic skin response and heart rate and given a maths task to complete, designed to get harder as you progressed in a small laboratory room for three minutes. They were timed using a stopwatch by another participant who had already taken part outside of the laboratory room. Once timed, results were taken from a ninety second interval of the three minutes and the mean was calculated using the BIOPAC software. The means were written down, both for heart rate and GSR.

Design and analysis

This was a repeated measures study. Participants took part in both the easy and difficult task. Heart rate and galvanic skin response were measured whilst the difficult task was being completed.

Results

Average heart rate scores from 137 participants were correlated with their EPQ scores using a Pearson correlation. This was conducted using SPSS v. 20. The scatterplot is shown in Figure 1 below:

The Pearson test showed no correlation between average heart rate scores and EPQ scores and the result was found to not be statistically significant. (r(137)=-0. 049, p= 0. 567).

Total EPQ scores from the 137 participants were also correlated with average GSR scores using a Pearson correlation. The scatterplot is shown in Figure 2 below:

The Pearson test showed no correlation between average GSR scores and EPQ scores and the result was found to not be statistically significant. (r(137)= 0. 020, p= 0. 820).

Discussion

The results showed no significant correlation between extroversion and heart rate and so the null hypothesis could not be rejected. The correlation between extroversion and galvanic skin response was also not significantly correlated and so the null hypothesis was accepted.

This study does not lend support to the findings of previous studies in this area of research into extroversion and physiological measures. A study Singapore mentioned in the introduction of this report found that extroverts were linked to lower cardiovascular reactivity during stress tasks and this seemed to affect how these particular individuals expressed and coped with anger (Jonassaint et al., 2009). Contrasting even further with the findings of this study, heart rate and skin responses have also been strongly correlated with students performing a visual endurance task who were scored on the EPI as introverts (Gange, Geen, & Harkins, 1979).

However some studies have also provided no support for the hypothesis of physiological measures being linked to extroversion. Small (1976), studied students exposed to fear arousing conditions whilst their heart rate and GVR was measured. He found no significant correlation, supporting the notion that extroversion does not correlate with physiological measures within different individuals. In addition to biological factors not always differing between introverts and extroverts, the environment playing an important role has also been criticised. In a study investigating the effect of familiar everyday or verbal noises on the cognitive performance of introverts and extraverts, no significant correlation was found (Avila, Furnham, & McClelland, 2012). This piece of research provides evidence of there being no clear correlation between extroverts and introverts differing physiologically.

Although the results did not provide significant hypotheses to support the notion that extroversion and physiological measures correlate, care must be taken with research that does support this idea. The direction of causality may be difficult to establish within this area of research. Physiological measures may not be caused by extroversion but other underlying factors. In a study by Cassidy & MacDonald, 2007, introverts appeared to be more affected by the presence of everyday music and noise when completing written tasks than extroverts. However studies similar to this trigger issues as the outcome of results may not have been due to extroversion, but other personality traits of the participants. For example it may simply be that an individual may struggle to complete tasks or write when there is noise or music in the background. In this study extroversion was measured beforehand but there is a possibility that the results they obtained may have been due to demand characteristics whereby a participant may have wanted to look more sociable than they actually are. This would make them score highly on an extroversion scale but in reality they are much quieter and so should have been scored as an introvert. This would cause the piece of research to lack validity. In order to make this study more reliable, another study contained different participants should be carried out to ensure that similar results are obtained.

Although the present study in this report contained a good sample size and had individuals from different age groups as its participants, it did not provide enough evidence to support the theory that extroversion causes an individual to enjoy stimulating environments, which in this case was the maths test. However, the findings in this report do lend support to the idea that extroversion and physiological measures are not strongly linked to one another (e. g. by Small, 1976). Overall, findings in this area of research lend support to the notion of encouraging children to become confident from a young age. For example, the more extroverted a person is, the more likely they are to be sociable and talk to others before a job interview and the more desirable they seem to be during such an interview (Caldwell & Burger, 1998).

In conclusion the present study found no significant correlation between extroversion and physiological measures in university students aged 18-65 in the UK and so cannot support Eysencks theory of extroversion. Future research into physiological measures and personality traits could be carried out to help support Eysencks theory; research into personality types as well as extroversion and individual traits could help to see which personality types cause certain physiological measures as well as particular traits more specifically. This could enable us to understand what truly causes a person to be an extrovert or an introvert, whether the answer lie in heritability and genetics, or the environment itself.