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How the Chameleon Effect Impacts Introverts and Extroverts in Social and Academic Settings

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The rationale for doing this study derived from my belief that it is important for college students to know which type of personality they possess and the ways that personality type might be impacted by the chameleon effect: the unconscious copying of mannerisms, postures, and facial expressions that changes one's self to match other people around them in social settings. (Lakin et al., 2003) This awareness will allow students to become more aware of the phenomenon's effect since, at times, the mind naturally adapts to situations that are problematic if they are not overcome. Additionally, the chameleon effect may impact each type of personality differently, and this knowledge can help college students perform better in academic settings as well as be safer in social settings as they will know how their personality is affected in these situations. It is important for students to know and understand these effects so they can navigate instances in which this phenomenon takes place. An example of this would be if a student begins to struggle in school, they would be able to better analyze whether it is due to the curriculum and teaching, or whether it is due to environmental factors, such as the people that they are around, such as those they are working with for a group assignment.

To date, research has only examined different aspects of the chameleon effect and introversion/extroversion separately. This study aims to investigate the ways the chameleon effect may impact introverts and extroverts differently in social and academic settings, with the intention of discovering who might be more impacted by the chameleon effect in these settings so parents will have the information and knowledge to help their child. The research question for the study was: does the chameleon effect impact introverts and extroverts differently when considering social or academic settings? I hypothesized that in social settings, extroverts would be more impacted by the chameleon effect than introverts; in academic settings, introverts would be more impacted by the chameleon effect than extroverts.

Literature Review

The Chameleon Effect

Humans are highly social creatures and as a result, do not like to be alone or feel as though they are not included in interactions with peers. Because of this, we have evolved to find ways to make sure we are a part of social groups and have relationships. (Lakinet et al., 2003) One method we employ is called the chameleon effect. The chameleon effect is the unconscious copying of mannerisms, postures, and facial expressions that changes one's self to match those of other people in social settings (Lakin et al., 2003), for example, verbal expressions or arm crossing (Chartrand & Bargh, 1999). This behavior also played a role in evolution, as it helped our ancestors survive, since large groups had a better chance of survival than individuals who were alone. (Buss & Kenrick, 1998; Johanson & Edgar, 1996)

It has been found that, through the perception-behavior link, when people observe someone else's behavior, the likelihood of mimicking that behavior increases. (Chartrand & Bargh, 1999) In connection to learning, the chameleon effect varies in its presence and intensity in academic settings pursuant to certain modalities, for example, the mimicking of the grammatical structure of their partners in group projects. (Schneider, 2014) In addition, people who are communicators can be observed automatically picking up the behaviors of those with whom they are interacting. (Beatty, 2009) As described, the chameleon effect is present in many aspects of life, however, the chameleon effect can impact people differently, as everyone has a different type of personality. (Nuwer, 2016)

Introversion and Extroversion

This study focuses on the personality types of introverts and extroverts. Introverts are people who like to spend more time thinking about things in their internal world, which includes reflections and ideas, as well as expending more energy when interacting with others. By contrast, extroverts are people who like to spend more time in their external world, which includes being active and interacting with people, as well as gaining energy from these interactions with other people. (Jung, 1971) On a scale system, people can either be more or less of the two as well as fall in between them. Many different questionnaires have measured where people fall on this scale, including the Colgate Personal Inventory and Freyd's measurement scale. (Whitman, 1929; Heidberder, 1926) These consist mostly of 50 to 70 questions as they were measuring other personality traits as well. The scales are very old but have been continuously used as they have been proven to measure personality traits well, with newer generations making variations that fit what they are studying. (Heidberder, 1926; Whitman, 1929) Because of the variety of possibilities as to where someone can fall on the scale, the chameleon effect will most likely impact individuals on the spectrum differently.

Thus far, there has not been a study that looked at the ways introvert and extrovert personalities are impacted by the chameleon effect, specifically in social and academic settings. Separately, studies have looked at ways introverts and extroverts engage in conversations, including Thorne, (1987), which found that when more extroverted people engaged in conversation together, there is a higher chance that the dialog is upbeat and diverse. By contrast, when more introverted people engage in conversation together, there is a higher chance that the dialog will be serious and focused. This illustrates the different ways conversations can happen

with people of these personality types in a social setting. Another study by Beatty, (2009), looked at the ways nonverbal communication is affected by mimicry, specifically focusing on cognitive resources. It found that there is a direct link between mimicry behavior and the complexity of the task that uses cognitive resources, with higher instances of mimicking behaviors during simple tasks and fewer instances of mimicking behaviors during more complex tasks. However, they do not account for the chameleon effect. Studies such as Schneider (2014) have also examined the ways the chameleon effect occurs in academic settings, focusing on visual and verbal coordination and how they benefit group activities for students.

After reviewing these previous studies, I found that there has not been an investigation on whether or not the personalities of the participants had an impact as well. Studies have examined how introversion and extroversion play a part in the way people speak up in group work, with a focus on how cultural beliefs tie into this research. (Hutchinson, 1997) This research found that extroverted people who have collective cultural beliefs, which emphasize the goals and needs of a community as a whole, prefer group work more than individuals who have an individualistic cultural belief, which focuses on the goals and needs of an individual rather than a community. While these studies are indicative of personality differences between introverts and extroverts, research on the relationship between personality types and the chameleon effect is still needed.

As shown from the literature review, researchers have explored at these components separately, and a few begin to combine them. However, it also demonstrates a paucity of sources in this area of research is, which is why a very select number of previous studies are referenced. My research aims to create a bridge between these factors producing a better understanding of how the chameleon effect and the personality types of introversion and extroversion interact so

that college students can use this information to better help themselves perform well in their higher academic journey.

Method

Design

In order to address my research question and hypothesis, I conducted a quantitative survey. My independent variable was introversion/extroversion and my dependent variable was the impact of the chameleon effect. This topic has been an area of study I have been interested in since learning about it in my psychology classes, and I wanted to explore it using these variables. I do not identify specifically with either personality type, therefore, going into this study, I had no particular bias or lens to influence the data collection. As it was an online survey, I did not see who completed it, which meant I had no control over who did or did not participate in the study.

Participants

My sample source was college students in introductory and human growth and development psychology classes. I recruited 88 participants, 65 females and 23 males, by contacting professors and asking them to send a link to my survey to their students as an extra credit opportunity. My participant pool was between the ages of 18-55 with a mean age of 21.36 (*SD*=6.11), and there was a mix of all class levels as well as first-generation, non-traditional, and transfer student populations. Exclusion criteria were participants under the age of 18.

Materials

Chameleon effect. I created the survey and it was influenced by different scenarios that are more likely to simulate the impact of the chameleon effect in specific settings. The survey was used instead of actually creating live in-person scenarios. The survey included four stories (involving two social and two academic settings) with one question each. (Figure 1) The questions for the stories section of the survey were dichotomous (yes/no) questions. The stories were reviewed by an expert in the field who did not know the subject of the research to see if they tested the desired variable: the chameleon effect. Both parties individually said that they believed the stories did work for their intended proposes. In total there were 4 questions with a score range 0-2 for the social settings and 0-2 for the academic settings. The 0 equals the answer no and 1 equals the answer yes, if the participant answered no to both, they would have a score of 0, but if they answered yes to both, they would have a score of 2. The lower a participant scored on the stories, the less impacted they were by the chameleon effect; the higher their score on the stories, the more impacted they were by the chameleon effect.

Survey Stories

Social vignettes 1 and 2

1s) Hunter and Jo are at a party and Jo leaves Hunter to go talk to other people. Hunter sees a group of people a little ways away laughing and have fun; he decides to walk closer and see what the others are doing. After a while of talking and laughing, people around him start to drink and suggest playing truth or dare. Hunter agrees with it even though he doesn't really want to drink or would play truth or dare because he likes the group.

2s) On a different day, Jo is hanging out with friends at one of their houses. After a while, some of the friends get bored and decide to look through storage for a game or something fun to do. One person finds an Ouija board and suggests that everyone play. Although he normally wouldn't play, Jo agrees with everyone else to play because he is with his close friends.

Academic vignettes 1 and 2

1a) Sally is taking a psychology class and her professor assigns a group project. The group meets after class and starts to brainstorm ideas for the project. Sally suggests a good idea, but no one really listens. After a couple more ideas are given, the others agree on one. Even after listening to everyone else explain their reasoning, Sally still thinks that her idea was better for the project, but agrees without going back to her idea so the group can move forward.

2a) Karren is having a discussion with one of her professors about her project. They have been having meetings for a while and her professor is starting to lean in a different direction for her project. After talking about things for an extended period of time, Karren finds that she is not as interested in this new direction but agrees with her professor so her project will not be delayed.

Figure 1: This shows the vignettes that participants were given in the Qualtrics survey.

Introversion/extroversion. I used a 10-question introversion/extraversion scale that I compiled by pulling questions from the International Personality Item Pool (2019), which originally included 50 questions. The tool was selected because it has been significantly referenced and used, meaning that the validity and accuracy of the measurements have been vetted. The introversion/extroversion scale responses were scored on a 5-point Likert-type scale, with sample responses including *completely describes me*, *somewhat describes me*, *neither describes me nor doesn't describe me*, *somewhat doesn't describe me*, *completely doesn't describe me*. The introversion/extroversion scale has a score range of 10 – 50, with lower

numbers representing extroversion and high numbers representing introversion. The scale questions came from a pre-existing and accepted scale, which suggested acceptable reliability through the nationally accepted psychological assessment measures for many different combinations of questions depending on the traits being measured. (International Personality Item Pool, 2019) The Alpha coefficient for the original introversion and extroversion scale is .87.

Procedure

The data collection was conducted online through Qualtrics. At the beginning of the semester, the professors from the previously stated psychology classes distributed the link to the survey, which I had given them before the beginning of classes. This communication included a brief introduction providing a very basic context of the study. Then the participants were then able to take the survey. At the beginning of the survey, participants received a consent form and following completion of the survey, they were given a debriefing statement. The survey took approximately ten minutes to complete.

Data Analysis

When entering the data, I used the number of the participant's survey (1^{st}, 2^{nd}, 3^{rd}, etc.) as an identifier for each participant's responses. I provided the answer to the research question (whether or not there is a correlation between introverts/extroverts and whom the chameleon effect impacts more in social and academic settings) by conducting descriptive statistics and correlational analyses. I used four of these analyses: two correlation analyses were conducted to identify a possible relationship between intro/extroversion and the chameleon effect in the

academic settings, and two to identify a possible relationship between intro/extroversion and the chameleon effect in the social settings, where analyses were conducted at the $\alpha = .05$ level.

Results

The study hypothesized that in social settings, extroverts would be more impacted by the chameleon effect than introverts, and in academic settings, introverts would be more impacted by the chameleon effect than extroverts. In order to assess this, multiple analyses were done in SPSS. The introversion and extroversion scale had a large frequency (the number of times a certain score came up) range with a minimum score of 13 and a maximum score of 46 with a mean of 30.89 (*SD*=7.97), as seen in Figure 2. The distribution of personality scores had a greater variance in females, with a mean of 29.82 (*SD*=8.27), than males, with a mean of 33.32 (SD=6.78). The results of the relationship between the scenarios and the personality score are shown in Figure 2 below.

Scenario	Setting Type	Yes Replies	No Replies	α	P-Value
1	Social	36	54	0.04	-0.185
2	Social	36	54	0.40	0.027
3	Academic	60	29	0.04	0.186
4	Academic	53	35	0.12	-0.123

This shows the results yielded from the correlational analyses of the survey.

Figure 2: The correlational results between the chameleon effect and the personality scores

Scenarios one and three showed significant values and scenarios two and four showed nonsignificant values under the standard .05 alpha level. This means that in scenario one extroverts showed more chameleon effect behavior and in scenario three introverts showed more chameleon effect behavior. Scenarios two and four showed that both introverts and extroverts had similar chameleon effect behavior. However, since there were four individual stories, the alpha level was changed, by the Bonferroni adjustment, to .013 making all the correlations nonsignificant.

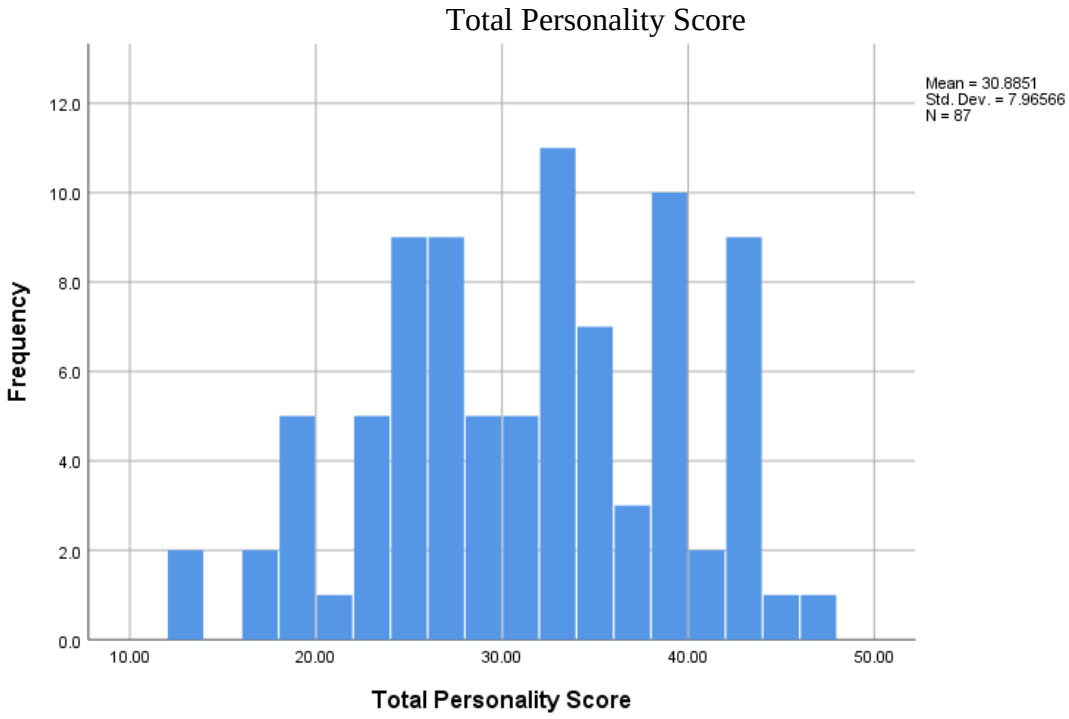

Figure 3: Lower scores represent more extroversion, higher scores represent more introversion.

Discussion

Scenario one, the first social setting, and scenario three, the first academic setting (Figure 1) both yielded the same results. In the first scenario, the more extroverted participants answered yes to the story and the more introverted participants answered no. This shows that in this type of

social setting extroverts were more affected by the chameleon effect than introverts, those who are more extroverted were more likely to unconsciously do the behavior of the chameleon effect, as they tried to mirror the actions of people around them in social settings. This, in turn, makes the people around them naturally want that person around since they are seeing that person engaging in the same behavior. In contrast, the third scenario participants who were more introverted answered yes, and more extroverted participants answered no. This shows that in this type of academic setting introverts are more impacted by the chameleon effect than extroverts. Those who are more introverted were more likely to unconsciously engage in the behavior of the chameleon effect, as stated above, in academic settings. This is because they want to be sure their group work will stay on track, and because they feel more comfortable in their internal world of learning.

Scenario two, the second social setting, and scenario four, the second academic setting (Figure 1) both yielded similar results. In both of these scenarios, there was no one group (more introverted or more extroverted) that answered yes or no more as compared to the other. I believe that this was because these two stories introduced two things that the other stories did not have. The second story introduced the familiarity of interacting with close friends, which makes both groups of people more comfortable. This possibly shows that when one is comfortable with those around them, it is less likely that they will revert to mirroring others since they have already been accepted and no longer fear that others will leave. The fourth story introduced authority by including interaction with a professor. No matter the group they fall into, students appear to want to follow the advice of their professor both because the professors are knowledgeable and because they have been taught to follow what their elders say.

After analysis of the introversion/extroversion scale (Figure 2), it was found that females showed a wider range on the scale than males did as described in the results above, with a 3.50 difference between the means and a 1.50 difference between the standard deviations. This could be because there was a significantly higher number of female participants than male participants. Most of the participants stayed around the middle of the scoring range, illustrating that people's personalities tend to lie on a spectrum with a mix of both introversion and extroversion. One explanation of this outcome could have been that participants wanted to avoid the highest and lowest ends of response choices when answering so as to remain more neutral for fear of judgment.

Overall the results of this study showed patterns that concurred with the original hypothesis. Extroverts were more impacted by the chameleon effect, demonstrating the behavior that falls in line with the phenomenon, in social settings with those they do not know, and introverts were more impacted by the chameleon effect in academic settings. However, these differences were not statistically significant. One of the limitations of this study was that it was only given to a convenient sample of college students in a select few introductory psychology classes. This is a very limiting factor as other major fields of study might have more males, which could have corrected the large gap between the male and female populations in this study. Another limiting factor was the fact that personalities of psychology majors may differ from those of other major fields of study. In addition, students in the psychology major would have a higher chance of being exposed to the chameleon effect in their classwork than students in non-psychology majors, which could have influenced their responses. The sample size was also limited as there were not enough participants to establish statistically significant results. That said, the present study did show that there is potential for a relationship between the variables

above, and thereby adds to the literature, suggesting that further studies should be done to learn more about the chameleon effect and its impact on different personality types.

Conclusion

I believe that future replication of the present study, with a larger population size and across a wider range of participants, can lead to more significant results and thus expand the literature around this area of study. It could also lead to an expansion of this research to younger individuals, including children and adolescents. Observing this phenomenon earlier in life could potentially lead to research on the affects on children and their interactions with their peers and other people.

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