

A Quantitative Study on Statistical Associations between Extroversion-Introversion Personality Traits and Anxiety in Different Stages of Lockdown during the Covid-19 Pandemic



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ABSTRACT: The Covid-19 pandemic has caused several changes in the human state of mind, in particular adapting to the culture of the new normal while lockdown measures are implemented. This study explored the effect of the lockdown measure on the level of anxiety of high school students, comparing those identified as introverts and extroverts. Participants (N = 103) filled out the given survey, which determined that they were both introverts or extroverts and the level of anxiety that they had before, during, and after the lockdown caused by the pandemic. According to statistical analysis, the result showed that the level of anxiety perceived by those feeling the sense of extroversion was statistically higher than those with introversion, at the significance level of 95%. In addition, the analysis revealed that there was no correlation between extroverts and anxiety before, during, and after the lockdown measures. On the other hand, there were statistical correlations between the level of introversion and the level of anxiety in every stage of lockdown: before, during and after, indicating that the lockdowns due to the global pandemic did not affect extroverted people anxiety as much as it affected introverts. Moreover, it also showed that the level of anxiety of the introverts has become even more intensified even after the lockdown.

KEYWORDS: Anxiety; Introversion; Extroversion; Covid-19; lockdown measure

I. INTRODUCTION

Covid-19 pandemic

Coronavirus disease (COVID-19) was a new coronavirus but later on renamed it to Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) (Hasöksüz, Kiliç, & Saraç, 2020). On the 1st December 2019, the first case of SARS-CoV-2 was reported. SARS-CoV-2 may have originated from the virus in animals that mutated so they can affect humans and cause illness. In the past, there were some disease outbreaks that originated from animals such as birds, pigs, and bats that mutated and infected humans (Johns Hopkins Medicine, n.d.). Over the course of 2 years from early 2020 to 2021, new variants of the virus have been reported such as Alpha, Beta, Gamma, Delta, Omicron (Roy, Dhillon, Habib, & Pugazhandhi, 2021) SARS-CoV-2 is a lot more infectious than other coronaviruses family like SARS or MERS-CoV since the Case Fatality Rate (CFR), or risk of dying, from the new coronaviruses is about 4.4%, so it is less deadly than SARS and MERS-CoV with 10% CFR and 34% CFR respectively. SARS-CoV-2 is less fatal than the previous coronavirus threat, that is why it spread so fast throughout the world. This is due to the fact that SARS-CoV-2 is less lethal, so people with either mild symptoms or no symptoms at all have been spreading the virus without awareness that they are already infected. Before the world health experts knew about this issue, the virus had already spread too many countries (Johns Hopkins Medicine, n.d.). In the situation with no vaccine or treatment for SARS-CoV-2 the only way to reduce the case is to reduce human contact. The less contact from each person, the less the virus spreads (Prather, Wang, & Schooley, 2020). From the situation where the virus rapidly spreads, many countries have decided to order a total lockdown, that only allows people to leave their place to get food or medical assistance, to minimize the contact between each person. Especially, to reduce the patients that will overwhelm the health systems (Gavi, the Vaccine Alliance, 2020).

Effect of lockdown on well being

According to Cambridge dictionary, lockdown is an emergency situation in which people are restricted to freely move around in and areas or places. The effects from lockdown are detrimental to mental health and wellbeing. Mental health associated

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with lockdown are anxiety and stress, both of the said mental conditions got severely worse due to the lockdown during the Covid-19 pandemic. Future policies should take the apparent associations between capabilities and current mental health and social support levels directly into consideration to reduce the negative long-term issues related to future public health emergencies (Simon, Helter, White, et al., 2021).

Personalities

There are two basic personalities according to Carl Jung, a Swiss psychiatrist, that propose this theory in the 20th-century (Jung, 2016). According to these theories, an extrovert is a kind of person whose interest is directly outward from himself to other people. On the other hand, an introvert is a kind of person whose interest is directly inward toward his own feelings (Britannica, T. Editors of Encyclopaedia, 2019). The typical extrovert enjoys doing group work, loves to meet others, avoids spending time alone, and easily makes new friends. The introvert personality is opposite to extrovert, the typical introvert avoids meeting with a large group of people or people they don't know well, loves staying with themselves, is very shy, and doesn't like talking to people much (Raypole, 2019). Most of the time extroverts are described as the life of the party, they love outgoing with other people but instead hate being alone. According to Carl Jung, he stated that extroverts are energized by interacting and crowds with others. They love to be the center of attention and aren't afraid to introduce themselves to new people when they meet. They love being in large groups and often make new friends. They often are the head of social events such as after-work cocktail parties and weekend activities. They are more likely to discuss their problems with others openly and make clear about their preferences, sometimes they also guide others (Holland, 2018).

Most of the time introverts are described as thoughtful and reserved, they avoid social engagement and special attention. However, being introverted isn't a measurable personality trait. They often refer to a low level of extroversion. Extroversion is one of the Big Five personality traits so introverts have opposite characteristics to extroversion such as love spending time alone and doing better in a quiet environment. They love being alone in their house, enjoying their quiet hobby or simply resting. They don't like going to big parties or social events, but sometimes they hang out with a smaller group of friends privately. They have greater sensitivity to negative situations since they have a hard time sharing their thoughts and feelings when they believe that others will disapprove or disagree with them, as a result they avoid conflict with others. They avoid group projects and prefer to work on their own and always choose to work behind the scenes. They have a small group of friends since they prefer few close friends (Holland, 2021). Ambivert is the personality trait between extrovert and introvert, they can flip into either extroversion or introversion depending on the situation, mood, goals or context. They have also been called social introverts, outgoing introverts, and antisocial extroverts. Ambiverts are flexible, in the right mood and around the right people they can be extroverts but when around toxic people or cranky and tired they can flip to introvert. They enjoy others but sometimes need time alone (Tanner et al., 2021). They can be on group projects after working independently. They can process internally and out loud. They are comfortable when working behind the scenes but won't mind going out on the stage but for a short time. They love being in the party and hanging out with others but stick to deadlines with a time limit. They are still quiet but feel best when given the opportunity to be involved in the conversation (Dr. Jasmine Shaikh, 2021).

Anxiety

Anxiety is a feeling of uneasiness or fear that might cause you to tense, sweat, or even rapid heart rate. It is a normal reaction when you feel stress or worry. Anxiety can happen when you face an uncomfortable situation such as before taking a test, face a difficult problem, or making an important decision. It can help you to cope better or boost energy. However, for some people that have anxiety disorders the feeling is not temporary and they can get overwhelming from it. Anxiety disorders are the condition when anxiety doesn't go away and make the condition worse when the time passes by. The symptoms can interfere with daily activity for example relationships, job, and schoolwork (U.S. National Library of Medicine, 2021). According to Suppawattaya et. al. (2020), it showed that social distancing, self-quarantine, and self-isolation have created difficulties for people such as psychological challenges, social problems, medical challenges and many more. In other words, anxiety can be caused by one of these forms of lockdown measure. Social distancing has the least effect among three types, people who are undergoing social distancing will face psychological challenges. In addition, people with self-quarantine also face psychological challenges with social problems due to lack of face-to-face connections and social interventions. But for some people they also faced medical and professional problems since their profession can't be done via online such as taxi driver, waiter/waitress, people in entertainment business, and many more. Lastly people with self-isolation, they faced with all challenges that mention earlier and some of them are worse like psychological problems that patients complain of having insomnia, depression or even suicidal.

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II. METHODOLOGY

The aim of this research study is twofold. First, we aim to explore statistical associations between personality and anxiety in different stages of lockdown during the global pandemic among high school students. Second, we aim to compare the difference in the level of anxiety between before, during, and after the lockdown. The participants in the study consist of high school students aged 14-19 in Bangkok. We gathered 103 responses in total; 43.3% which were male, 49% which were female, and 7.7% preferred not to state their gender. A three-part questionnaire consisting of 21 questions was developed and verified by four experts with an Item-Objective Congruence (IOC) Index rating more than 0.5 (Jusoh, Zubairi, & Badrasawi, 2018) for each question prior to the dispersion as an online form through various social media. The questionnaire was voluntary and anonymous, the participants had the right to withdraw the questionnaire at any time. All data was kept confidential and only used for the purpose of data analysis. Section 1 is composed of 3 demographic questions including the participants' gender, age, and grade level. Section 2 considers the participants' personality as shown in table 1, and consists of 6 items. To indicate each participant's personality, the Big Five Inventory (BFI) scale was used; it was developed by John, Donahue, and Kentle in 1991. BFI measured the level of introversion and extroversion of the participants. Participants rate each BFI item on a 5-point Likert scale ranging from 1 to 5; scale scores are computed as the participant's mean item response.

Table 1: Personality and anxiety questionnaire item

Personality statement	Category Identified
I love going out with a large group of friends	Extrovert
I prefer solving personal problems on my own	Introvert
I become energetic when sharing my thoughts and feelings with other people	Extrovert
I become exhausted when meeting with unfamiliar people	Introvert
I am keen on meeting new people	Extrovert
I tend to be reserved when dealing with people I don't know well	Introvert

Section 3 is a retrospective section which examines the level of anxiety during 3 stages of lockdown based on the respondents' past experiences, and consists of 12 items. The Revised Child Anxiety and Depression Scale (RCADS) items which determine the level of anxiety in each respondent (de Ross, Gullone, & Chorpita 2002) were used and arranged using the five-point Likert scale (ranging from 1 (strongly disagree) to 5 (strongly agree)). The analysis on the questionnaire reliability was carried out using Cronbach Alpha from 30 respondents. They were chosen to complete the questionnaire as a representative group. Cronbach value was calculated using Statistical Product and Service Solution (SPSS) version 28, and the value acquired was 0.897, which is appropriate for practical use (Tavako, & Dennick, 2011). Pearson's correlation coefficient, and t-test were used for analyzing the data.

III. RESULTS

Table 2 represents the mean and standard deviation of the 5 variables. The introvert variable's mean was 3.81 while the extrovert's mean was 3.31, indicating that this group of respondents were neither completely extrovert nor introvert in general. The mean anxiety levels before, during, and after are 2.99, 3.47, and 3.52 respectively. It is evident that there is a statistical significant difference between the level of anxiety after, during and before the lockdown ($p = 0.00$) while the anxiety level during and after lockdown showed no significance ($p = 0.40$) as shown in table 3.

Table 3 shows correlation coefficients, $r = 0.43$, $r = 0.36$, and $r = 0.47$, which reveals that there is a correlation between introverts and level of anxiety before and after the lockdown, and no correlation between introverts and level of anxiety during the lockdown. Extroverts on the other hand do not show a correlation with the level of anxiety before, during, and after the lockdown.

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Table 4 shows correlation coefficients, $r = 0.43$, $r = 0.36$, and $r = 0.47$, which reveals that there is a correlation between introverts and level of anxiety before and after the lockdown, and no correlation between introverts and level of anxiety during the lockdown. Extroverts on the other hand do not show a correlation with the level of anxiety before, during, and after the lockdown.

Table 2: Descriptive statistics results based on the personality and anxiety questionnaire (N = 103)

	Mean	Std. Deviation	N
Introvert	3.81	0.67	103
Extrovert	3.31	0.76	103
Anxiety before lockdown	2.99	0.99	103
Anxiety during lockdown	3.47	0.90	103
Anxiety after lockdown	3.52	0.90	103

Table 3: The p-values as a result from the T-test analysis

	During	After
Before	0.00	0.00
During	-	0.4

Table 4: Correlation coefficients based on the personality and anxiety questionnaire (N=103)

Category	Before the lockdown	During the lockdown	After the lockdown
Introvert	0.43	0.36	0.47
Extrovert	-0.05	0.00	-0.07

IV. DISCUSSIONS

Our results indicated that the level of anxiety after and during lockdown were apparently higher than prior to the lockdown. One finding found that demographic characteristics and experiences (feelings and behaviors) during COVID-19 pandemic lockdown period were associated with anxiety after lockdown when children and adolescents went back to school. Suicidal ideation, quarreling with parents, insomnia, inattention during online learning, anxious and depressed mood were positively associated with anxiety (Liu, Yue, Hu, Zhu, Wu, Wang, & Wu, 2021). In other words, the negative effects that had been accumulating during lockdown have lasted even after the lockdown ended.

The finding of this study offers an alternative explanation to previous research in which introverts are reported to be less likely to be affected by COVID-19 (Gruda, & Ojo, 2021). A contrast is shown in this study that the opposite is true. According to "The power of introverts" by Susan Cain (2012), introverts can get used to being around others if they interact with other people regularly, so when the lockdown decreases interactions between other people it might make introverts more anxious about being around people. This might be the reason why those with introversion tend to be more anxious compared to those with extroversion when the lockdown is lifted or it might be because of a new variant of the virus such as Omicron (Tanne, 2021). Again, a stark contrast is shown among the results with extroverts. The previous study suggests that they would be more likely to worry about not being as socially active as they were before restrictions (Gruda, & Ojo, 2021) but based on our results in this study, there is no correlation between anxiety and extroversion. This might be possible that they might be able to find different ways to get around this. Suggested by this study, physical isolation might not make extrovert people more anxious.

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V. LIMITATIONS AND FUTURE RESEARCH

Our study is not without limitation. Firstly, the most important limitation is the retrospective questionnaire section that regards the respondents' anxiety level; our data would have been more precise if the questionnaire was prospective instead. Secondly, our results and interpretations are found to oppose recent studies and perhaps to the intuitive assumption of many, especially in the respect of a lack of association between extroversion and anxiety. Thus, more studies should be further conducted to validate our present findings. In addition, we recommend the implementation of future research on this topic to compare the differences between extreme introverts and extreme extroverts to provide clearer results and also consider other factors into the data analysis, such as age, gender and factors that might affect the level of anxiety of extroverts and introverts.

VI. CONCLUSION

This research aims to explore statistical associations between personality and anxiety in different stages of lockdown during the COVID-19 pandemic among high school students as well as comparing the difference in the level of anxiety between before, during, and after the lockdown. According to the results, there were statistical associations between introverts and the level of anxiety. Introverts tend to have more anxiety coming out of lockdown than before lockdown. On the other hand, extroverts showed no correlation in any of the stages. In conclusion, our study points out that people remain anxious even after the lockdown. The level of anxiety did not go as low as it was before the lockdown early in 2020. This might be due to the fact that the virus is still around us and people may be afraid of the new variants of the virus. That's why they are still anxious.

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