Student POV[1]: The Relationship Dynamic of Factors and Adherence to COVID-19 Preventative Measures

Universiteit Utrecht

"This thesis has been written as a study assignment under the supervision of a Utrecht University teacher. Ethical permission has been granted for this thesis project by the ethics board of the Faculty of Social and Behavioural Sciences, Utrecht University, and the thesis has been assessed by two university teachers. However, the thesis has not undergone a thorough peer-review process so conclusions and findings should be read as such."

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[1] POV: Acronym of Point of View

Abstract

This study investigates to what extent risk perception and governmental trust correlate with students' compliance with COVID-19 masking and testing behaviour over time. A multi-regression data analysis was conducted using an existing longitudinal quantitative set that researched 100 freshman psychology students at Konstanz University in Germany. Findings indicated that high-risk perception was prevalent when the reported death cases were high and there was high trust in the government present among the students but no correlation with the stringency of measures. Furthermore, the results also note that adherence to masking and testing decreased as the reported death cases decreased and the stringency of measures decreased. This can indicate that students adhere more to preventative measures when the situation is serious (leading to death) and the government puts more stringency of measures in place. However, this study found no significant relationship between risk perception, governmental trust, and student adherence to COVID-19 preventative measures.

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Introduction

Problem Statement

      COVID-19 has been the talk of the town for almost three years. As of mid-2022, the virus had infected more than 500 million people worldwide (United Nations Statistics Division, 2022). It continues to pose challenges to the health and well-being of individuals globally (UNSD, 2022; World Health Organization, 2022). While attention has been given to the global health effects of covid, this research seeks to put specific attention to student adherence to COVID-19 preventative measures.

      It is important to investigate student adherence because research has reported that the spread of covid is prominent among students, especially if there is no adherence to preventative measures (Ningsih, Eka & Danal, 2021; WHO, 2022; McCarthy, 2020). Although young adults experience fewer complications from the disease, they may represent a risk by acting as carriers of the virus (Yang et al., 2020). Recent estimates suggest that the probability to be asymptomatic carriers, from whom viral transmission is possible, is 14.3% among young adults (Yang et al., 2020; Fan, Li, Li, Zhu and Fu, 2021). Conducting research with students as the target group offers a unique insight into understanding their behaviour and essentially aids with information for the development of policy or interventions for this target group. Furthermore, essential to limiting the spread of COVID-19 and future pandemics is compliance with preventative measures (Joslyn et al., 2021). This research chose masking and testing as preventative measures because they were one of the common mandatory measures to battle the spreading of the virus. Nevertheless, the question now is what factors influence students to adhere to mask-wearing and testing behaviour.

      According to recent research among university students, risk perception can be a prominent factor contributing to student adherence (Giese, Gamp, Stok, Gaissmaier, Schupp & Renner, 2021). Furthermore, since the adherence measures to minimize COVID-19 spread

were mostly administered by the government in collaboration with medical/health professionals, do students adhere to what the government implements based on their trust level? It is also relevant to look at contextual factors such as epidemiological situations and measure stringency because risk perception and trust in government are also likely to change with context (H Yue, H, Lau, Chan & Ng, 2022; Pak, McBryde & Adegboye, 2021; Shabu, M-Amin, Mahmood & Shabila, 2021; Bargain & Aminjonov, 2020). Particularly epidemiological situations for risk perception and measure stringency for governmental trust (H Yue et al., 2022; Pak et al., 2021; Shabu et al., 2021; Bargain et al., 2020). Thus, due to these reasons, the researcher was curious to investigate if risk perception and governmental trust act as determining factors for students when it came to COVID-19 adherence measures. It is important to start investigating factors that can be significant to provide in-depth insight into the relationship dynamics because as education resumes, it is essential to have a baseline for monitoring trends in COVID-19 infections to establish improvement measures that prevent the virus spread. The research is also relevant from a scientific perspective because it aims to provide a systematic quantitative picture of the dynamic between factors such as risk perception and governmental trust and adherence to health behaviour (testing and mask) among university students.

Theoretical Framework

This research used the Health Belief Model as the theoretical framework. The 'Health Belief Model' (HBM) is a theoretical model that can be used to guide disease prevention programs as well as health promotion (Goren, Vashdi & Beeri, 2022; Sihotang et al., 2023). It is used to explain and predict individual changes in health behaviour (Goren et al., 2022; Sihotang et al., 2023). Correlating it with risk perception, the two constructs in the HBM that researchers most frequently use to determine an individual's perceptions of disease are perceived susceptibility (PSU) and perceived severity (PSV) (Sihotang et al., 2023; Hong,

Choi, Choi & Joung, 2021). PSV is a person's perception of how serious the Covid-19 problem is and PSU is a person's perception of the risk of being caught by a disease (Sihotang et al., 2023; Hong et al., 2021). Furthermore, researchers proposed to use the HBM perceptive and trust in government to moderate the role of trust in adopting government services during COVID-19 with HBM perspectives (Sihotang et al., 2023). This is because trust in government is considered a prominent factor in enhancing public compliance with policies and services (Goren et al., 2022; Sihotang et al., 2023). The results from that study found that the HBM factors (perceived susceptibility, perceived benefit, and perceived barriers, moderated by trust in government, significantly affect the intention to adopt government e-services during COVID-19 (Sihotang et al., 2023). This indicates that the trust variable can have a significant effect on the HBM perception variables. Thus, the two main parts of the model are (1) risk perception (consisting of perceived susceptibility and perceived severity); and, (2) efficacy perceptions (consisting of perceived benefits and perceived barriers).

Empirical Research

In this research, the variable risk perception is used as an operationalization for (1), and the variable trust in government as an operationalization for (2). Furthermore, there are different covid safety adherence behaviour that can be studied but for this research, the variables that were operationalized were masking behaviour and testing behaviour.

Risk Perception – COVID-19

Risk perception is explained as a subjective assessment of the actual or potential threat something has in the life of an individual (Lohiniva et al., 2022). It is typically a mixture of 'how severe is the threat' and 'how likely will I be impacted by the threat' (Lohiniva et al., 2022). Thus, this indicates that the individual usually assesses a situation based on the severity of the existing threat and the chances they have of being impacted by

the presented threat. Furthermore, when assessing adherence of an individual, risk perception often predicts the willingness of the person to adhere to public health measures and accept public health messages (Lohiniva et al., 2022). Thus, indicating that the higher the risk perception, the more adherence of the individual to public health measures and messages.

Recent studies have shown that the risk perceptions towards COVID-19 of an individual significantly impact whether or not they are protecting themselves and practicing compliance with preventive health behaviours (Cipolletta et al., 2022; Ahuja et al., 2021). According to research done in China, risk perception may influence the preventative behaviour of college students during an epidemic (Ren et al., 2022). The research indicated that how a student perceives the risk of getting infected may influence their adherence to preventative measures (Ren et al., 2022). Another study also indicated that they found a moderate correlation between risk perception and preventive behaviours among students (Batra, Urankar, Batra, Gomes, S & Kaurani, 2021). Moreover, research suggests that adherence to preventive measures is influenced by a high-risk perception of COVID-19, whereby a lower perceived risk leads to lower adherence (Cipolletta et al., 2022). Another research investigated the risk perceptions and behavioural responses of university students and academics toward the COVID-19 pandemic (Shabu et al., 2021). Most of the respondents were students and the study noted that there was a weak positive correlation between risk perception and protective behaviours (Shabu et al., 2021). The participants adhered to preventative measures reasonably, but the frequency of adherence to some preventative measures was relatively low (Shabu et al., 2021). These findings suggest that students are more likely to adhere to covid safety measures if their risk perception of the infectious disease is high.

Trust in government represents the certainty or satisfaction of citizens with the perceived credibility of the government and performance (Han et al., 2021; Uslaner, 2018; Zmerli & Van der Meer, 2017). Previous studies revealed that a higher level of trust in the government was correlated with a greater willingness to follow a range of government suggestions such as adopting preventive health behaviours (Han et al., 2021). Moreover, political affiliation can also influence governmental trust because which political party the individual identifies with can determine whether or not they listen or adhere to government proposals (Keele, 2007). This indicates that if the individual belongs to or endorses the current political party, they are more likely to trust the decisions of the current government in contrast to someone that does not. Community members mentioned that aspects that contribute to high governmental trust concerning covid are when a government is perceived as well-organized, publishes clear messages and knowledge on COVID-19, and perceives fairness (Han et al., 2021). Previous studies has also indicated that higher trust in the government regarding COVID-19 control was correlated with higher adoption of preventative behaviours (wearing masks, more testing, handwashing, and self-quarantine) (Han et al., 2021).

Moreover, there has been preliminary evidence connecting public trust to adherence with government guidelines at the beginning stage of the COVID-19 pandemic (Bargain, 2020; Devine, Gaskell, Jennings, & Stoker, 2020; Freeman et al., 2020; Goldstein & Wiedemann, 2020; Olsen & Hjorth, 2020; Schmelz, 2021). However, these studies were generally limited by a small sample size, restricted to the early stage of the pandemic, and the cross-sectional design (Han et al., 2021). Furthermore, a longitudinal study in Singapore from January – April 2020, indicated that trust in government communication was positively associated with the likelihood of adhering to preventative measures (Han et al., 2021; Lim et

al., 2021). This indicates that when people have a higher trust in their government, they are more likely to adhere to introduced preventative measures.

To conclude, despite the fact there has been a lot of progress in research on topics related to COVID-19, it is important to mention that it is still an ongoing infectious disease. Thus, it is important to continue research to decrease the existing knowledge gaps and this research can be used to provide information on the examined topics and target group.

Research Questions and Hypotheses

The main research question in this paper is "To what extent do risk perception and governmental trust correlate with students' compliance in conjunction with COVID-19 masking and testing behaviour over time?". To be able to answer the main research question, the following sub-questions have been developed:

- How do risk perception and trust in government among students evolve and how does that correlate with the COVID-19 epidemiological situation and stringency of measures in the country?

- How do masking and testing behaviour among students evolve and how does that correlate with the COVID-19 epidemiological situation and stringency of measures in the country?

- Do risk perception and governmental trust predict masking and testing behaviour over time among students?

Based on existing research and the theoretical framework, the following hypotheses are formulated:

- H1: It is expected that trust in government to be negatively related to the stringency of measures and risk perception to be positively related to the number of covid-related deaths.

- H2: It is expected that both masking and testing are positively related to the stringency of measures and the number of covid-related deaths.

- H3: Risk perception and governmental trust positively influence masking and testing behaviour. (i.e. more trust, more masking and testing. Higher risk perception, more masking and testing).

Research Methods

Study Design

This research used quantitative secondary data from the *SozNet 2021* study of the Department of Psychology at Konstanz University in Germany. The SozNet 2021 study investigated the development of social networks among first-year psychology students as well as tracking (changes in) various health behaviours, covid behaviours' and health outcomes over time. However, this current study used a subset of the dataset, focusing only on covid-related items. The research design was a longitudinal prospective cohort study administered through monthly online surveys. A longitudinal study is a research design that involves a repetitive examination of the same variables over a long or short period (Thomas, 2022). Three different surveys were administered to the participants which included a baseline survey (November 2021), identical monthly surveys (December 2021 – March 2022 and May 2022), and a final survey (November 2022).

Study Sample, Recruitment, and Procedure

The participants for this research were freshman students in the psychology department at the university. The total sample size was 100 participants (N=85). The average age of the respondents was 21 (*M*= 20.57, *SD*= 3.46) and ranged from 18 years to 38 years. Of the 100 respondents, 86% were female. Furthermore, the majority of the participants had a more left-winged political affiliation (73%). All psychology freshmen were invited to participate in the study during their first and second semester during one of their first lectures.

Information about the study was provided and students were able to ask additional questions. Students that agreed to take part in the study received the questionnaires via their student e-mail. The baseline questionnaire was distributed in semester one (November 2021; T0). Further, five (bi-) monthly questionnaires tracked the development of the social network and health behaviours through the months of December 2021 to March 2022 and May 2022 (T1-T5). Moreover, the final questionnaire was distributed in the month of November 2022 (T6), which concluded the questionnaire administration. At the beginning of the questionnaires there was a consent description written which indicated that if the student took part in the questionnaire, they are giving their consent to use the collected data in anonymized form for analysis and publication in scientific manuscripts. The students who did not want to participate or decided to stop participating during the study did not incur any negative consequences from their decision. Students who completed the survey were compensated with 10 euros per hour or course credit for the same hours. Completion of the baseline (T0), May (T5), and final (T6) survey were compensated with one hour equivalent and all other time-points were 0.5-hour equivalent.

Study Variables and Operationalization

For this study, the variables of interest were risk perception, governmental trust, self-reported masking, and testing behaviour.

For self-reported masking and testing behaviour, the students were asked how often they would wear a mask in an enclosed public space and would do a corona test. They had choices between never, once a month, more times in a month, more times in a week, and always (5-point Likert scale). The answers were then computed to an average of never, once per month to multiple times per month, and multiple times per week to daily. For governmental trust, the participants were asked in what way they trust the government in Germany tries to keep covid under control. The answering options were 5- point Likert scales

between not true at all to completely true. The answers were then recoded into low trust (consisting of scores 1= not true at all and 2= not true), neutral (score 3), and high trust (scores 4= true and 5= completely true).

Moreover, risk perception was assessed with two items. The participants were asked firstly how they would rate the severity of covid infection and secondly the likelihood of contracting covid in the next month. The answering options were 5- point Likert scale points between very unlikely to very likely. For the severity of covid infection, the answers were recoded into low severity (consisting of scores 1= very unlikely and 2= unlikely), neutral (3), and high severity (scores 4= likely and 5= very likely).

Lastly, demographic questions were also part of the surveys. For this study, age, gender and political affiliation (all assessed at T0) were the demographic questions of interest. For political affiliation, the participants were asked 'People use the terms left and right to denote political views, when you think about your own political views, where would you place them on a scale'. Their answering option was a 10-point scale between left and right.

Data Analysis

The analysis of the data was twofold. Firstly, descriptive analyses were conducted to plot the development of risk perception, trust in government, masking behaviour, and testing behaviour across all time points (T0 through T6). This was done to provide descriptive and longitudinal outcomes. These were then compared to the evolvement of stringency of measures as well as the number of covid-related deaths in Germany. The 'Oxford Coronavirus Government Response Tracker (OxCGRT)' project calculated a stringency index (Hale et al., 2021; Mathieu et al., 2020). The index records the strictness of government policies that primarily restrict people's behaviour. It is determined using all ordinal containment and closure policy indicators, and an indicator recording public information

campaigns (Hale et al., 2021; Mathieu et al., 2020). The index consists of nine metrics but for this research, the metrics index chosen were school closures, closures of public transport, face covering, and testing policies.

Lastly, a multiple regression analysis was conducted to determine the influence of risk perception and governmental trust (Independent variables) on masking and testing (Dependent variables), controlling for socio-demographic variables. For this analysis, two sets of time points were selected: the influence of independent variables at T0 on dependent variables on T1, as well as independent variables at T5 on dependent variables at T6. The choice to investigate time points T0 on T1 and T5 on T6 was based on using the most distant time points available in the data to test the stability of the results. Multiple regression allows the determination of the relative contribution of each of the predictors to the variance explained and with the longitudinal data, an explanation can be given on outcome for a particular person using data from the baseline and later (Moulton, O'Neill, Park & Ploubidis, 2020).

The hypotheses and data-analysis were pre-registered on AsPredicted[2] with code-number #128942. Preregistration refers to the specification of a study's hypotheses, methodology and statistical analysis before inspecting the research data (Mertens and Krypotos, 2019). It typically takes the form of a document that is made publicly available on a timestamped repository or website and since the hypotheses, methods and statistical plan is known before the beginning of the study, the chances of presenting post-hoc hypothesizing and analysis as a priori decisions are reduced (Mertens et al., 2019). While this study makes use of existing data, preregistration is valid because the authors conducting these analyses were not involved in the data collection and have not had access to the data before data

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[2] AsPredicted preregistration link: https://aspredicted.org/L9P_VS5

collection was completed. No analysis has been conducted yet on these data by the executing researchers. This is in line with the guidelines set forth by Mertens and Krypotos, 2019, and prevents post-hoc decisions about the selection of time points for our multiple regression analysis.

Ethical Aspects

The research project in which these data were collected received ethical approval from Konstanz University in 2021. Furthermore, the secondary data analyses in this master's thesis also received ethical approval from the ethical committee of the Faculty of Social and Behavioural Sciences of Utrecht University (see appendix 1).

Results

Descriptive and Over-time Changes

Risk Perception

      Firstly, for risk perception, the researcher looked at the severity of covid infection throughout the time-points as well as likelihood of contracting covid. For severity, it can be seen that in the beginning of the study, the majority of the participant would indicate covid infection as something with high severity and this decreases over time (Figure 4). Furthermore, for the likelihood of contracting covid, it is seen that at the beginning of the study, the majority of the participants indicated that they were very unlikely to contract covid in the next month (Figure 5). This however changes over time for which we can see a decrease then a beginning increase then a decrease again.
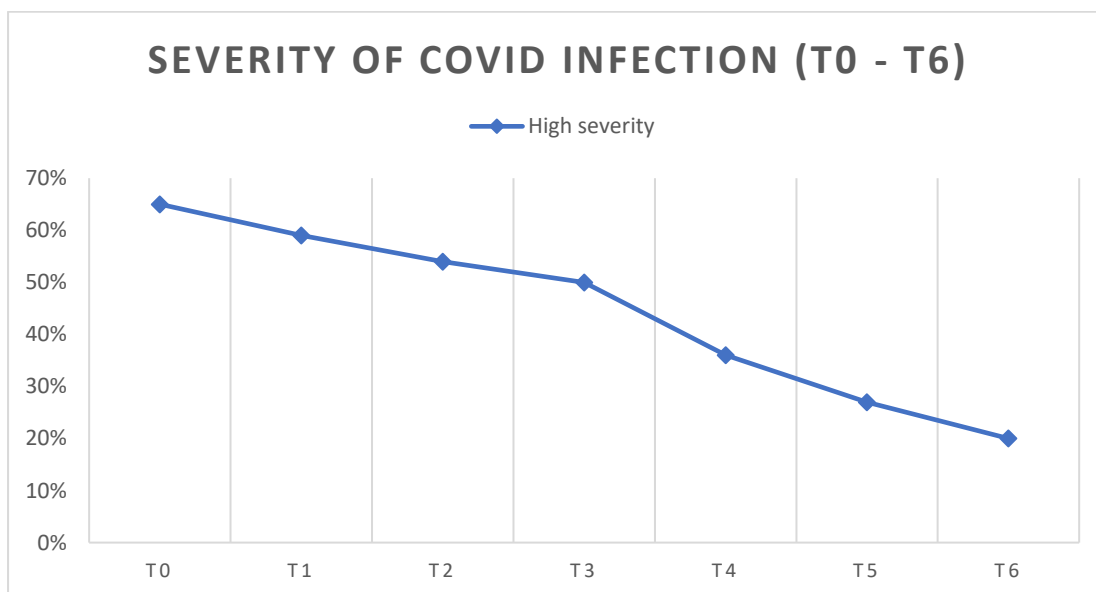

Figure 4: High perception of the severity of covid infection reported by the student participants throughout the study.
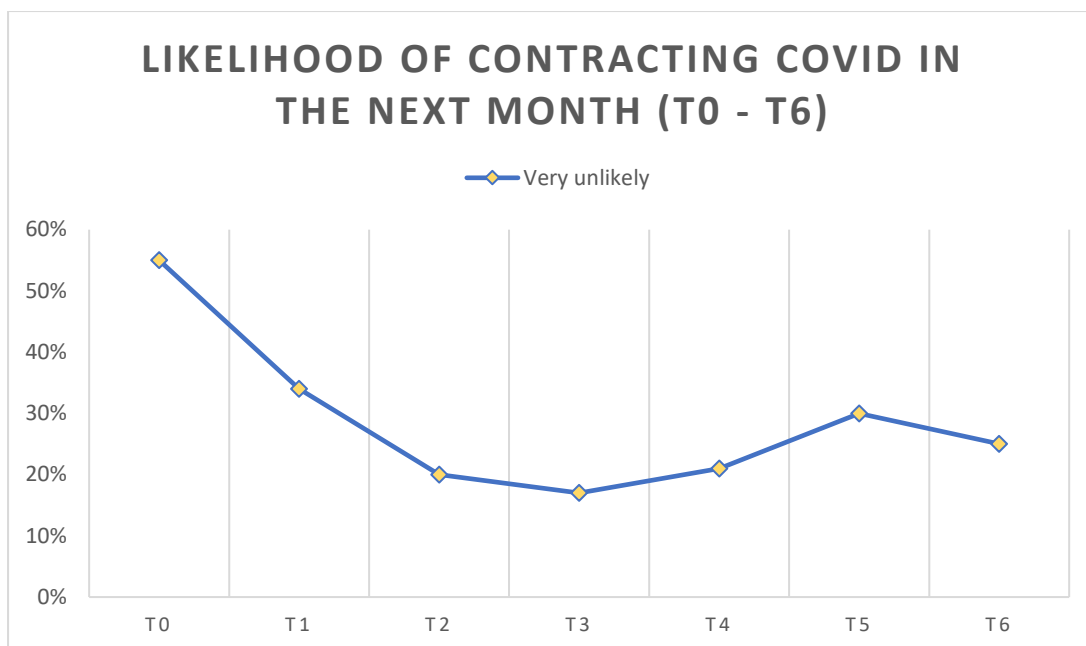
Figure 5: Likelihood of contracting covid in the next month reported by the student participant throughout the study.

In Germany, from 3 January 2020 to 31 May 2023, there have been 174,247 confirmed deaths cases of COVID-19, reported to WHO (World Health Organization, 2023). In table 1 is an overview of the number of covid-related deaths between November 2021 till November 2022 (the time period for which the study has been conducted).

Dates	Number of covid-related deaths[3]	Time points (of the study)
November 1 – 29, 2021	1,652 – 2,847	T0
December 6 – 27, 2021	2,582 – 1,047	T1
January 3 – 31, 2022	887 – 1,479	T2
February 7 – 28, 2022	1,694 – 1,573	T3
March 7 – 28, 2022	1,798 – 1,596	T4
May 2 – 30, 2022	535 – 271	T5
November 7 – 28, 2022	639 – 784	T6

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[3] World Health Organization (COVID-19, Deaths), 2023: WHO Coronavirus (COVID-19) Dashboard | WHO Coronavirus (COVID-19) Dashboard With Vaccination Data

Comparing the risk perception reported by the students in the study with the death cases in Germany it can be noted that when the number of covid-related deaths where high, the high severity of covid infection was also high. However, it can be noted that the likelihood of contracting covid fluctuates. Thus these results accept that risk perception is positively related to the number of covid-related deaths.

Governmental Trust

Secondly, for governmental trust, in figure 6 we can see the changes among the participants. It is noted that in the beginning of the study, high trust in government is more prevalent among the participant than low trust. This changes throughout the study in which the trust in the government fluctuates but ultimately at the end it is seen to be the same as the beginning.
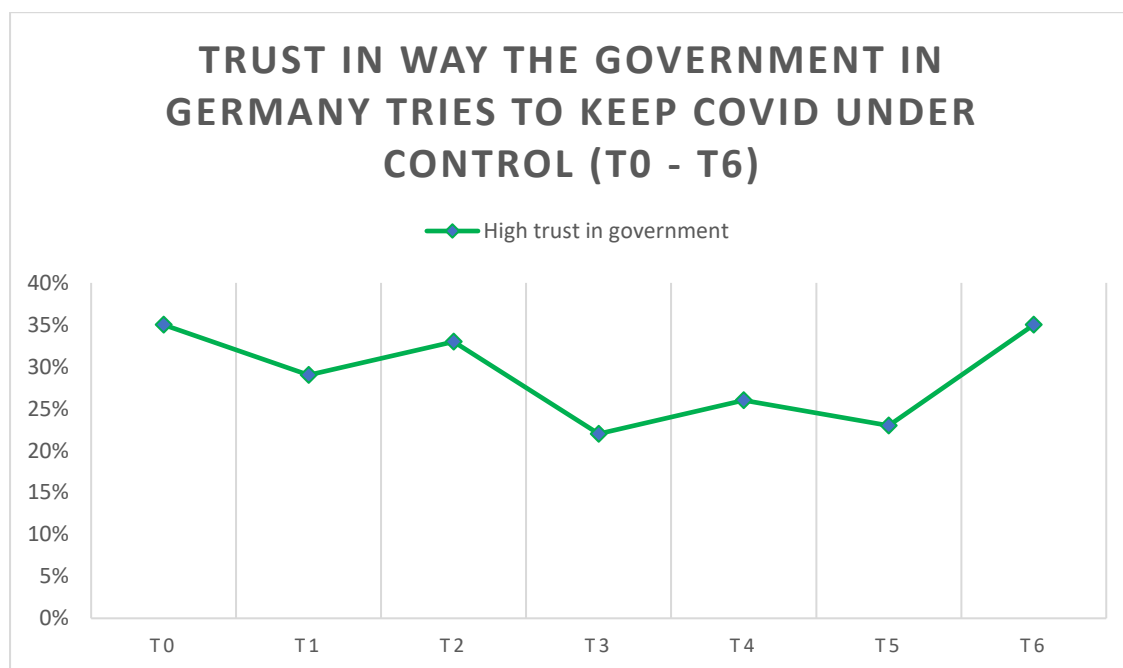

Figure 6: Changes in trust in the way the government in German is keeping covid under control reported by the student participant throughout the study.

These are the information that have been reported from November 2021 till November 2022 for the stringency of measures (school closures, public transportation, face covering and testing policy) in Germany (Hale et al., 2021; Mathieu et al., 2020).

Stringency of measures index	Government Policies issued
School closures	In November 2021 (required only at some level) then from December 2021 no measures.
Public transportation	No measures.
Face covering	Required in some specified shared/public spaces outside the home with other people present, or some situations when social distancing is not possible.
Testing policy [4]	Open public testing (e.g. "drive-through' testing available to asymptomatic people).

Comparing the governmental trust reported by the students in the study with the stringency of measures in Germany it can be noted that most of the stringency of measures have been smoothed for which it does not provide an adequate representation to relate to the trust that has been reported. Thus these results reject that trust in government negatively relates to the stringency of measures.

Self-reported Testing and Masking Frequency

Lastly, for self-reported testing frequency, the majority of the participants started with testing once per month to multiple times per month and the minority of students test frequently or never (Figure 7). This changes throughout the data collection for which we see a decrease in the testing once per month to multiple times per month as well as an decrease in testing frequently. On the other hand we see an increase in never testing for covid. Moreover, for self-reported masking frequency, the majority of the participants reported at the beginning of the study to the frequent use of masks (Figure 8). Never and vaguely were the minority options. This changes throughout the data collection for which we see a decrease of frequent

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[4] Note that this relates to PCR testing for the virus only; it does not include non-PCR, antibody testing.

mask usage and an increase of vaguely using it more than never. This indicates that the

participant would still use the mask but the frequency has decreased.
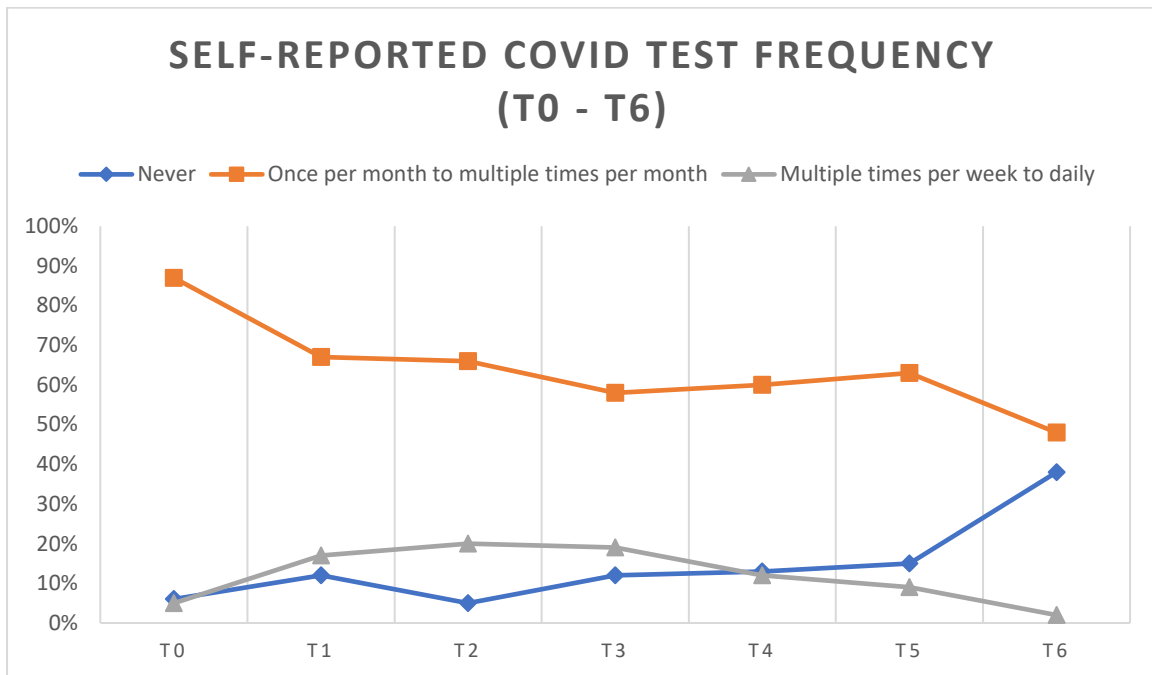

Figure 7: Changes of the self-reported covid test frequency reported by the student participants throughout the study.
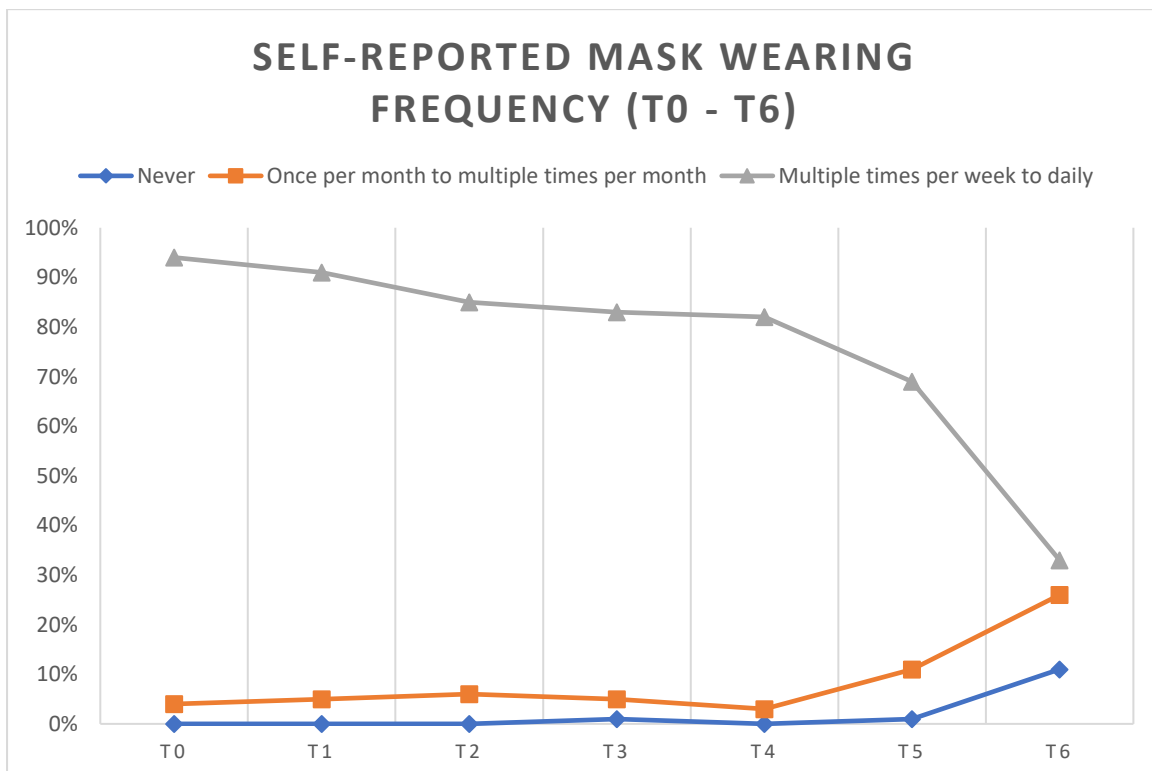

Figure 8: Changes of the self-reported mask wearing frequency reported by the student participants throughout the study.

Comparing the changes of self-reported testing with the changes of number of death in and stringency of measures in Germany it can be noted that as the death cases go down and the measures are smoother, the reported cases of testing also goes down. Moreover for mask wearing it can be noted that as the death cases go down and the measures are smoother, the reported cases of mask wearing also goes down. Thus, these results accept the hypothesis H2 (It is expected that both masking and testing to be positively related to the stringency of measures and to the number of covid-related deaths).

Multiple Regression Analysis

A multiple regression was calculated to predict T1 self-reported covid testing frequency from T0 severity of covid infection, T0 likelihood of contracting covid in the next month, T0 trust in the way the government in Germany tries to keep covid under control and using age, gender and political affiliation as control variables. The overall results showed an insignificant regression equation $F(6, 89) = 1.181, p > 0.05,$ with an R^2 of .074. The individual analysis showed that T0 severity of covid infection (*Beta* = -0.039, $t(95) = -0.363,$ *ns*) and T0 trust in the way the government in Germany tries to keep covid under control (*Beta* = 0.036, $t(95) = 0.733,$ *ns*) had no significant prediction as well as no significant individual prediction from the control variables. However, T0 likelihood of contracting covid in the next month (*Beta* = 0.257, $t(95) = 2.465, p < 0.05$) did significantly predict the dependent variable.

Moreover, a multiple regression was calculated to predict T1 self-reported mask-wearing frequency from T0 severity of covid infection, T0 likelihood of contracting covid in the next month, T0 trust in the way the government in Germany tries to keep covid under control and using age, gender and political affiliation as control variables. The overall results showed an insignificant regression equation $F(6, 89) = 0.776, p > 0.05,$ with an R^2 of .050. The individual analysis showed that all three independent variables had no significant

prediction ($p > 0.05$) as well as no significant individual prediction from the control variables.

Furthermore, a multiple regression was calculated to predict T6 self-reported covid testing frequency from T5 severity of covid infection, T5 likelihood of contracting covid in the next month, T5 trust in the way the government in Germany tries to keep covid under control and using age, gender and political affiliation as control variables. The overall results showed an insignificant regression equation $F(6, 77) = 0.723, p > 0.05,$ with an R^2 of .052. The individual analysis showed that all three independent variables had no significant prediction ($p > 0.05$) as well as no significant individual prediction from the control variables.

Lastly, a multiple regression was calculated to predict T6 self-reported mask-wearing frequency from T5 severity of covid infection, T5 likelihood of contracting covid in the next month, T5 trust in the way the government in Germany tries to keep covid under control and using age, gender and political affiliation as control variables. The overall results showed an insignificant regression equation $F(6, 77) = 1.065, p > 0.05,$ with an R^2 of .077. The individual analysis showed that all three independent variables had no significant prediction ($p > 0.05$) as well as no significant individual prediction from the control variables.

These results indicate that there is no significant correlation between the dependent variables (mask-wearing and testing) and the independent variables (risk perception and governmental trust). These results also indicate that socio-demographic control variables did not predict significant correlation. Thus, hypothesis H3 (risk reception and governmental trust positively influence masking and testing behaviour) is rejected.

Discussion

This research studied to what extent risk perception and governmental trust correlated with students' compliance in conjunction with COVID-19 testing and masking behaviour over time. To be able to answer this main research question, three sub-questions were developed.

The first sub-question was how do risk perception and governmental trust among students evolve and how does that correlate with the COVID-19 epidemiological situation and measures in the country. For risk perception, at the start of the study, the majority of the students indicated high severity of covid infection. This decreased over time and correlated with the death cases in Germany, there was a positive relationship between severity and death cases. This means that when high death COVID-19 cases were reported, high severity of covid infection was reported. Thus indicating that students correlate high severity of covid when there are high reports of deaths. This is in accordance with results from other research which illustrates when there is a high prevalence of death in a virus/illness, there is a higher presence of severity of risk perception (Lohiniva et al., 2022; Shabu et al., 2021). This is also presented in the HBM theoretical framework because researchers frequently use perceived severity to determine individuals' perceptions of a disease to explain or predict changes in health behaviour (Sihotang et al., 2023; Hong et al., 2021). Furthermore, the likelihood of contracting covid fluctuates over time and does not give a clear correlation with the death cases in Germany. This can be because the students might take the necessary precaution to not get infected or do not mind getting infected. After all, they are not the vulnerable group (Yang et al., 2020).

Moreover, the governmental trust reported by the students fluctuates over time but it is mostly seen to be relatively high among the students. However, correlating these results with the stringency of measures is difficult because most of the measures have been smoothed for which an adequate representation of adherence is not significant. A recent study has indicated

that high governmental trust in relation to COVID-19 is linked to a government that provides clear knowledge and messages about the situation, is well-organized, and is perceived as fair (Han et al., 2021). This means that even though correlating governmental trust and the stringency of measures among the students has not be significant, the factors mentioned in recent studies might contribute as an explanation as to why the students had high governmental trust throughout the study.

The second sub-question was how do masking and testing behaviour among students evolve over time and how does that correlate with the COVID-19 epidemiological situation and measure in the country. Taking a look at the presented results, masking and testing behaviour among students decrease over time. Correlating these behaviours with the death cases in Germany and stringency of measures, both masking and testing among student decrease as death cases become less and stringency measures become smoother. This indicates that there is a correlation between masking and testing behaviour and COVID-19 epidemiological situation and measure in the country. This is in accordance with the extended parallel process model which explains that emotional reactions (fear of a health threat) determines behavioural decisions (Domosławska-Żylińska, Krysińska-Pisarek, Czabanowska & Sesa, 2022; Birhanu et al., 2021). The model further explains that a health risk (COVID-19 in this case) can lead to either maladaptive/self-defeating or adaptive/self-proactive behaviours based on efficacy and threat levels (Domosławska-Żylińska et al., 2022; Birhanu et al., 2021). Explaining that those belonging to the responsive group choose the adoption of COVID-19 guidelines with an extreme motivation and those in the proactive category practice minimal self-protective responses (Domosławska-Żylińska et al., 2022; Lorettu et al., 2021). Contrastingly, the avoidant group presents defence mechanisms such as denial to COVID-19 guidelines and the indifferent group does not consider the issue of COVID-19 as relevant (Domosławska-Żylińska et al., 2022; Lorettu et al., 2021).

The third sub-question was do risk perception and governmental trust predict masking and testing behaviour over time among students. Looking at the presented results, the multiple regression analysis have no significant predictions. This indicates that risk perception and governmental trust do not predict masking and testing behaviour over time among students. This is different in comparison to results from other research. Recent studies have indicated a significant correlation between risk perception and adherence to preventative measures, specifically high-risk perception of COVID-19 (Cipolletta et al., 2022; Ren et al., 2022; Batra et al., 2021) and high level of governmental trust was correlated with willingness to adhere to governmental preventative health behaviours (Han et al., 2021).

Strengths and Limitations

This study used existing data of 100 psychology freshman students which is a specific target group. This limits the potential of generalization of the results thus indicating that future studies may analyse if the found patterns apply to a broader population. However, this study can be seen as the baseline for further research among students and it is important to note that the different ages and sex from the sample provided a broader representation of the targeted population. Thinking about the reliability of this research, the same questions were asked in the surveys to the students over time in the study. The participants would provide different answers to the questions due to self-reported answers and contextual situations. This research can be replicable; however, the sample can supply different results. Lastly, Reflecting on the validity of this research, the design, data, and tools were appropriate for the research. To be able to answer the main research question and sub-questions, the longitudinal data set was a good data tool because this study aimed to present to what extent factors correlate with adherence to preventative measures among students over time.

Conclusion

In conclusion, this study can serve as a baseline to explore factors related to adherence to COVID-19 preventive measures among university students. The study findings indicated that high-risk perception was prevalent when the reported death cases were high, there was no correlation between the likelihood of contracting covid with reported death cases and there was high trust in the government present among the students but no correlation with the stringency of measures. Furthermore, adherence to masking and testing decreased as the reported death cases decreased and the stringency measures got smoother. However, to answer the main research question, there was no significant relationship between risk perception, governmental trust, and student adherence to COVID-19 preventative measures. Future research is needed to investigate whether the results might differ with a larger sample size or with other factors or preventive measures. This is of relevance to health professionals and educators for future pandemic management or health-related threats in education.

References

Ahuja, M., Mamudu, H.M., Weierbach, F.M., Dowling-McClay, K., Stewart, D.W., Awasthi, M., & Paul, T.K. (2021). Perceptions of risk for COVID-19 among individuals with chronic diseases and stakeholders in Central Appalachia. *Humanities & Social Sciences Communications,* 8, 225. DOI: https://doi org.proxy.library.uu.nl/10.1057/s41599-021-00906-7

Bargain, O., & Aminjonov, U. (2020). Trust and compliance to public health policies in times of COVID-19. *Journal of Public Economics*, 192, 104316. DOI: https://doi.org/10.1016/j.jpubeco.2020.104316

Batra, K., Urankar, Y., Batra, R., Gomes, A. F., S, M., & Kaurani, P. (2021). Knowledge, Protective Behaviors and Risk Perception of COVID-19 among Dental Students in India: A Cross-Sectional Analysis. *Healthcare (Basel, Switzerland)*, *9*(5), 574. DOI: https://doi.org/10.3390/healthcare9050574

Birhanu, Z., Ambelu, A., Fufa, D., Mecha, M., Zeynudin, A., Abafita, J., Belay, A., Doyore, F., Oljira, L., Bacha, E., Feyisa, J., Hadis, Z., Ayele, K., Addisu, Y., Gutu, B., Tesfaye, D., Tilahun, T., Imana, G., Tolosa, T., Mekonen, S., Yitayih, Y., Jibat, N., Moges, M., Adamu, A., Teym, A., Kenea, A., Addis, T., Mengesha, A., & Kebede, Y. (2021). Risk perceptions and attitudinal responses to COVID-19 pandemic: an online survey in Ethiopia. *BMC public health*, 21(1), 981. DOI: https://doi.org/10.1186/s12889-021 10939-x

Cipolletta S., Andreghetti G.R., & Mioni G. (2022). Risk Perception towards COVID-19: A Systematic Review and Qualitative Synthesis. *International Journal of Environmental Research and Public Health*, 19(8):4649. DOI: https://doi.org/10.3390/ijerph19084649

Devine, D., Gaskell, J., Jennings, W., & Stoker, G. (2020). Trust and the coronavirus pandemic: What are the consequences of and for trust? An early review of the literature. *Political Studies Review*, 1–12. DOI: https://doi.org/10.1177/1478929920948684

Domosławska-Żylińska, K., Krysińska-Pisarek, M., Czabanowska, K., & Sesa, G. (2022). Vaccinated and Unvaccinated Risk Perceptions and Motivations for COVID-19 Preventive Measures Based on EPPM-A Polish Qualitative Pilot Study. *International journal of environmental research and public health*, 19(20), 13473. DOI: https://doi.org/10.3390/ijerph192013473

Fan, C., Li, M., Li, X., Zhu, M., & Fu, P. (2021). Who Got Infected with COVID-19? A Study of College Students in Wuhan (China). *International Journal of Environmental Research and Public Health*, 18(5), 2420. DOI: https://doi.org/10.3390/ijerph18052420

Freeman, D., Waite, F., Rosebrock, L., Petit, A., Causier, C., East, A., Jenner, L., Teale, AL., Carr, L., Mulhall, S., Bold, E., & Lambe, S. (2020). Coronavirus conspiracy beliefs, mistrust, and compliance with government guidelines in England. *Psychological Medicine*, 1–13. DOI: https://doi.org/10.1017/S0033291720001890.

Giese, H., Gamp, M., Stok, F.M., Gaissmaier, W., Schupp, H.T., & Renner, B. (2021). Contagious health risk and precautionary social distancing. *Frontiers in Psychology*, vol. 12. DOI: https://doi.org/10.3389/fpsyg.2021.685134

Goldstein, D. A. N., & Wiedemann, J. (2020). Who do you trust? The consequences of political and social trust for public responsiveness to COVID-19 orders. *SSRN Electronic Journal*, 1–69. DOI: http://dx.doi.org/10.2139/ssrn.3580547.

Goren, T., Vashdi, D., & Beeri, I. (2022). Count on trust: the indirect effect of trust in government on policy compliance with health behaviour instructions. *Policy Sciences*, 55, 1-38. DOI: 10.1007/s11077-022-09481-3.

Hale, T., Angrist, N., Goldszmidt, R., Kira, B., Petherick, A., Phillips, T., Webster, S., Cameron-Blake, E., Hallas, L., Majumdar, S., & Tatlow, H. (2021). "A global panel database of pandemic policies (Oxford COVID-19 Government Response Tracker)." Nature Human Behaviour. DOI: https://doi.org/10.1038/s41562-021-01079-8.

Han, Q., Zheng, B., Cristea, M., Agostini, M., Bélanger, J., Gützkow, B., Kreienkamp, J., & Leander, N. (2021). Trust in government regarding COVID-19 and its associations with preventive health behaviour and prosocial behaviour during the pandemic: A cross-sectional and longitudinal study. *Psychological Medicine,* 1-11. DOI: doi:10.1017/S0033291721001306.

Hong, C., Choi, H., Choi, E.K., & Joung, H.W. (2021). Factors affecting customer intention to use online food delivery services before and during the COVID-19 pandemic. *Journal of Hospitality and Tourism Management,* 48, 509–518. DOI: https://doi.org/10.1016/j.jhtm.2021.08.012.

H Yue, R.P., H, B., Lau, P., Chan, C.L.W., & Ng, S.M. (2022). Risk perception as a double edged sword in policy compliance in COVID-19 pandemic? A two-phase evaluation from Hong Kong. *Journal of Risk Research,* 25:9, 1131-1145. DOI: 10.1080/13669877.2021.1936612.

Joslyn, S., Savelli, S., Duarte, H. A., Burgeno, J., Qin, C., Han, J. H., & Gulacsik, G. (2021). COVID-19: Risk perception, risk communication, and behavioral intentions. *Journal of experimental psychology. Applied*, 27(4), 599–620. DOI: https://doi.org/10.1037/xap0000398

Keele, L. (2007). Social Capital and the Dynamics of Trust in Government. *American Journal of Political Science*, *51*(2), 241–254. DOI: http://www.jstor.org/stable/4620063

Lim, V. W., Lim, R. L., Tan, Y. R., Soh, A. S., Tan, M. X., Othman, N. B., Dickens, S. B., Thein, TL., Lwin, M. O., Ong, R. TH., Leo, YS., Lee, V. J., & Chen, M. I. (2021). Government trust, perceptions of COVID-19 and behaviour change: Cohort surveys, Singapore. *Bulletin of the World Health Organization,* 99(2), 92101. DOI: https://doi.org/10.2471/BLT.20.269142.

Lohiniva, A. L., Pensola, A., Hyökki, S., Sivela, J., & Tammi, T. (2022). COVID-19 risk perception framework of the public: an infodemic tool for future pandemics and epidemics. *BMC Public Health*, 22, 2124. DOI: https://doi.org/10.1186/s12889-022 14563-1

Lorettu, L., Mastrangelo, G., Stepien, J., Grabowski, J., Meloni, R., Piu, D., Michalski, T., Waszak, P. M., Bellizzi, S., & Cegolon, L. (2021). Attitudes and Perceptions of Health Protection Measures Against the Spread of COVID-19 in Italy and Poland. *Frontiers in psychology*, 12, 805790. DOI: https://doi.org/10.3389/fpsyg.2021.805790

Mathieu, E., Ritchie, H., Rodes-Guirao, L., Appel, C., Giattino, C., Hasell, J., Macdonald, B., Dattani, S., Beltekian, D., Ortiz-Ospina, E., & Roser, M. (2020). "Coronavirus Pandemic (COVID-19)". Published online at OurWorldInData.org. Retrieved from: https://ourworldindata.org/coronavirus [Online Resource]

McCarthy, N. (2020). COVID-19's staggering impact on global education. Retrieved from: https://www.weforum.org/agenda/2020/03/infographic-covid19-coronavirus-impact global-education-health-schools/

Mertens, G., & Krypotos, A. M. (2019). Preregistration of Analyses of Preexisting Data. *Psychologica Belgica*, *59*(1), 338–352. DOI: https://doi.org/10.5334/pb.493

Moulton, V., O'Neill, D., Park, A. & Ploubidis, G.B. (2020). *Analysing longitudinal data*.
CLOSER Learning Hub, London, UK: CLOSER. Retrieved from:
https://learning.closer.ac.uk/regression-analysis-longitudinal-data/

Ningsih, O. S., Eka, A. R., & Danal, P. H. (2021). Factors predicting adolescents'
compliance on Covid-19 prevention protocols. *Indonesian Nursing Journal of
Education and Clinic,* 6(1), 55-63. DOI: 10.24990/injecv6i1.365injec.aipni
ainec.org/index.php/INJEC/index

Olsen, A. L., & Hjorth, F. (2020). Willingness to Distance in the COVID-19. Retrieved
from: https://osf.io/xpwg2/.

Pak, A., McBryde, E., & Adegboye, O.A. (2021). Does High Public Trust Amplify
Compliance with Stringent COVID-19 Government Health Guidelines? A Multi
country analysis using data from 102,627 individuals. *The Journal of Risk
Management and Healthcare Policy*, 14:, 293-302. DOI: 10.2147/RMHP.S278774.

Ren, J., Zhang, Z., Mei, Y., Wang, W., Sun, Q., Wang, M., & Hui, Z. (2022). Risk perception
of COVID-19 among college students in China: Latent profile analysis. *Frontiers in
public health*, *10*, 1041580. DOI: https://doi.org/10.3389/fpubh.2022.1041580

Schmelz, K. (2021). Enforcement may crowd out voluntary support for COVID-19 policies,
especially where trust in government is weak and in a liberal society. *Proceedings of
the National Academy of Sciences of the United States of
America*, 118(1), e2016385118. DOI: https://doi.org/10.1073/pnas.2016385118.

Shabu, S.A., M-Amin, K., Mahmood, K.I., & Shabila, N.P. (2021). Risk Perception and
Behavioral Response to COVID-19: A Survey of University Students and Staff in the
Iraqi Kurdistan Region. *The Journal of Health and Social Care: Social Work in Public
Health*, 36:4, 474-485. DOI: 10.1080/19371918.2021.1915909.

Sihotang, D.M., Andriqa, M.R., Alfahmi, F.N., Wahyudi, A.S., Besila, M.A.H., Yulianang, M.A., Diana, E., & Hidayanto, A.N. (2023). The moderating role of trust in government adoption e-service during Covid-19 pandemic: health belief model perspective. *International Journal of Information Technology*, 15, 1545–1553. DOI: https://doi.org/10.1007/s41870-023-01203-z.

Thomas, L. (2020). Longitudinal study: Definition, approaches and examples. Retrieved from: https://www.scribbr.com/methodology/longitudinal-study/

United Nations Statistics Division (UNSD). (2022). *Ensure healthy lives and promote wellbeing for all at all ages.* Retrieved from: https://unstats.un.org/sdgs/report/2022/Goal-03/

Uslaner, E. M. (2018). The Oxford Handbook of social and political trust. Oxford: Oxford University Press.

World Health Organization (WHO). (2022). *The first international conference on health promotion.* Retrieved from: https://www.who.int/teams/health-promotion/enhanced wellbeing/first-global-conference

World Health Organization (WHO). (2022). *WHO coronavirus (COVID-19) dashboard.* Retrieved from: https://covid19.who.int/measures

Yang, X.Y., Gong, R.N., Sassine, S., Morsa, M., Tchogna, A.S., Drouin, O., Chadi, N., & Jantchou, P. (2020). Risk Perception of COVID-19 Infection and Adherence to Preventive Measures among Adolescents and Young Adults. *Children*, 7(12): 311. DOI: https://doi.org/10.3390/children7120311

Zmerli, S., & Van der Meer, T. W. (2017). Handbook on political trust. Cheltenham, UK: Edward Elgar Publishing.

Appendices

Appendix 1: Interdisciplinarity

This study aimed to describe the relationship between risk perception, governmental trust, and adherence to COVID-19 preventative measures among students. Existing research has presented through different disciplines such as psychological, sociological, and behavioral how the studied factors influence adherence to the preventative measures. Moreover, this research also incorporates the health belief model (HBM) as the theoretical framework. The theoretical framework combines research in different disciplines such as medical, psychological, sociological, and communication to explain how the studied factors influence adherence to preventative measures for COVID-19 (Goren et al., 2022). Thus, this study emphasizes that to provide answers for a complex social issue influences and research from different disciplines are incorporated and needed.

Appendix 2: Ethical Approval FERB

	Faculty of Social and Behavioural Sciences
P.O. Box 80140, 3508 TC Utrecht The Board of the Faculty of Social and Behavioural Sciences Utrecht University P.O. Box 80.140 3508 TC Utrecht	Faculty Support Office Ethics Committee **Visiting Address** Padualaan 14 3584 CH Utrecht

Our Description	23-0191	
Telephone	030 253 46 33	
E-mail	FETC-fsw@uu.nl	
Date	27 January 2023	
Subject	Ethical approval	

ETHICAL APPROVAL

Study: Student POV: The relationship dynamic of factors and COVID-19 adherence to health behavior

Principal investigator: M.V. Da Silva De Sousa

Supervisor: Marijn Stok

The study is approved by the Ethical Review Board of the Faculty of Social and Behavioural Sciences of Utrecht University. The approval is based on the documents sent by the researchers as requested in the form of the Ethics committee and filed under number 23-0191. The approval is valid through 30 June 2023. The approval of the Ethical Review Board concerns ethical aspects, as well as data management and privacy issues (including the GDPR). It should be noticed that any changes in the research design oblige a renewed review by the Ethical Review Board.

Yours sincerely,

Peter van der Heijden, Ph.D.
Chair
This is an automatically generated document, therefore it is not signed

Appendix 3: Data Analysis Syntax

Demographic Analysis

DATASET ACTIVATE DataSet1.

FREQUENCIES VARIABLES=age

 /STATISTICS=STDDEV MEAN MEDIAN

 /BARCHART PERCENT

 /ORDER=ANALYSIS.

FREQUENCIES VARIABLES=gender

 /STATISTICS=STDDEV MEAN MEDIAN

 /BARCHART PERCENT

 /ORDER=ANALYSIS.

FREQUENCIES VARIABLES=t0_politicalpref

 /STATISTICS=STDDEV MEAN

 /BARCHART PERCENT

 /ORDER=ANALYSIS.

Descriptive and Over-Time Changes

DATASET ACTIVATE DataSet1.

FREQUENCIES VARIABLES=t0_SR_test_freq t1_SR_test_freq t2_SR_test_freq T3_SR_test_freq

  T4_SR_test_freq T5_SR_test_freq T6_SR_test_freq

 /STATISTICS=STDDEV MEAN

 /ORDER=ANALYSIS.

FREQUENCIES VARIABLES=t0_SR_mask_freq t1_SR_mask_freq t2_SR_mask_freq T3_SR_mask_freq

  T4_SR_mask_freq T5_SR_mask_freq T6_SR_mask_freq

 /STATISTICS=STDDEV MEAN

 /ORDER=ANALYSIS.

FREQUENCIES VARIABLES=t0_trustgov t1_trustgov t2_trustgov t3_trustgov t4_trustgov t5_trustgov

  T6_trustgov

 /STATISTICS=STDDEV MEAN

 /ORDER=ANALYSIS.

FREQUENCIES VARIABLES=t0_SR_severitycorona t1_SR_severitycorona t2_SR_severitycorona

  T3_SR_severitycorona T4_SR_severitycorona T5_SR_severitycorona T6_SR_severitycorona

 /STATISTICS=STDDEV MEAN

```
/ORDER=ANALYSIS.
```

FREQUENCIES VARIABLES=t0_SR_riskcorona t1_SR_riskcorona t2_SR_riskcorona T3_SR_riskcorona

  T4_SR_riskcorona T5_SR_riskcorona T6_SR_riskcorona

 /STATISTICS=STDDEV MEAN

 /ORDER=ANALYSIS.

Multiple Regressions

DATASET ACTIVATE DataSet1.

REGRESSION

 /MISSING LISTWISE

 /STATISTICS COEFF OUTS R ANOVA CHANGE

 /CRITERIA=PIN(.05) POUT(.10)

 /NOORIGIN

 /DEPENDENT t1_SR_test_freq

 /METHOD=ENTER age gender t0_politicalpref

 /METHOD=ENTER t0_SR_severitycorona t0_SR_riskcorona t0_trustgov.

REGRESSION

 /MISSING LISTWISE

 /STATISTICS COEFF OUTS R ANOVA CHANGE

 /CRITERIA=PIN(.05) POUT(.10)

 /NOORIGIN

 /DEPENDENT t1_SR_mask_freq

 /METHOD=ENTER age gender t0_politicalpref

 /METHOD=ENTER t0_SR_severitycorona t0_SR_riskcorona t0_trustgov.

REGRESSION

 /MISSING LISTWISE

 /STATISTICS COEFF OUTS R ANOVA CHANGE

 /CRITERIA=PIN(.05) POUT(.10)

 /NOORIGIN

 /DEPENDENT T6_SR_test_freq

 /METHOD=ENTER age gender t0_politicalpref

```
 /METHOD=ENTER T5_SR_severitycorona T5_SR_riskcorona t5_trustgov.
```
REGRESSION
```
 /MISSING LISTWISE

 /STATISTICS COEFF OUTS R ANOVA CHANGE

 /CRITERIA=PIN(.05) POUT(.10)

 /NOORIGIN

 /DEPENDENT T6_SR_mask_freq

 /METHOD=ENTER age gender t0_politicalpref

 /METHOD=ENTER T5_SR_severitycorona T5_SR_riskcorona t5_trustgov.
```