Compliance with behavioural guidelines in Sweden during the Covid-19 pandemic:

The role of personality traits and perceptions of the situation

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The Covid-19 pandemic caused countries across the world to implement a wide range of restrictions and recommendations to control the spread of the virus. The current study aimed to investigate how differences in personality traits and differences in how an individual perceives the situation of Covid-19 among Swedish university students affect the overall compliance with guidelines applied by their government. A total of 106 university students completed a questionnaire measuring personality traits (Big Five) and perceptions of the situation (Situational Eight DIAMONDS) in relation to their self-estimated compliance. The data analysis showed that the students complied with the guidelines with a mean of 77%. Individuals who were less agreeable and perceived less adversity in the Covid-19 situation complied more. All predictor variables could account for approximately 28% of the explained variance in compliance. These results are of importance in a preparatory purpose for governments to efficiently cope with future threats.

Keywords: Covid-19, compliance, big five personality traits, perception, situational eight diamonds

Introduction

During the year of 2020, the world faced challenges and tragedies due to the Covid-19 pandemic. Countries implemented a wide range of governmental restrictions and recommendations with varying outcomes because of the populations' response and compliance with those policies. A country that stood out regarding governmental restrictions was Sweden, which gained worldwide attention due to their choice of implementing behavioural guidelines rather than restrictions. The guidelines consisted of social distancing, washing hands frequently, staying home if you are ill and keeping gatherings of people to a minimum (Folkhälsomyndigheten, 2020). For the most part schools and kindergartens remained open except for some higher secondary schools and universities where distance education was implemented. This contrasts with the obligatory restrictions introduced globally where people were placed in lockdown and forced to wear masks outdoors. A comparative survey constructed to investigate attitudes, opinions and fears among Norwegian and Swedish citizens toward the implemented measures, suggested that even though the two countries differ in their handling of the pandemic (Norway implemented much harsher restrictions), the majority of the people in both nations supported and complied with the preventive measures introduced by the authorities (Helsingen et al., 2020). Overall, the health care systems and authorities were perceived as reliable by the people of Norway and Sweden. This finding can also be validated by other studies that were conducted during an Ebola outbreak (Bavel et al., 2020), which demonstrated that trust in governments

and institutions has led to greater compliance with the transmission mitigation measures established. Since guidelines have been implemented worldwide as an endeavour to prevent the virus from spreading, there is an immense interest in studying the degree to which the citizens within a country have complied with the policies. Crises such as a pandemic will most certainly reoccur in the future, therefore it is of the utmost importance that countries are well-prepared for the possible threats.

   Alongside the pharmaceutical research of finding possible solutions in battling Covid-19, social and behavioural sciences can contribute to a greater knowledge of how to deal with the crisis and its implications. One aspect that must be considered when trying to understand why some people comply with the restrictions and some people do not, even though lives may depend on it, is the psychological phenomena of perception. As a pandemic can threaten an individual's psychological, emotional and physical well-being, the current situation may elicit emotions of fear. According to Witte and Allen (2000), what causes a behavioural change depends on how individuals perceive their efficacy despite emotions of fear. People who experience feelings of helplessness and do not feel like they can cope with the threat, turn to defensive reactions such as avoidance, reactance and denial. In contrast, people who do feel like they can deal with the situation despite experiencing fear, generate the greatest behavioural change. This can be manifested through a coping style characterised by a solution-oriented attitude and a willingness to adopt measures in order to control the threat. Taking that into account, peoples' perception of an ongoing pandemic may be an important variable when predicting the outcomes of guidelines implemented by the authorities within a country to mitigate the spread. If the threat is being perceived as controllable, people may be willing to change their behaviour in accordance with recommendations and restrictions. This falls in line with research conducted on perceptions of situations which argues that it stems from an individual's subjective interpretation and the objective characteristics of a situation (Serfass & Sherman, 2013; Sherman et al., 2013). Edwards and Templeton (2005) emphasised the necessity of measuring human characteristics, as well as the situation, in order to predict behaviour, as the expression of human attributes and personality traits are partially dependent on the situation. Furthermore, they stated that just as people have personality traits and attributes, similarly, situations can be viewed to have qualities or characteristics. With a lack of research in the field, it was not long ago that the first steps were taken towards a consensus of how to study psychological situations and a taxonomy was created: The Situational Eight DIAMONDS (Duty, Intellect, Adversity, Mating, pOsitivity, Negativity, Deception and Sociality) by Rauthmann et al. in 2014. While the lack of research in the sphere of situations (and perceptions of them) has been pointed out many times (Endler & Magnusson, 1976; Edwards & Templeton, 2005; Rauthmann, 2012; Rauthmann et al., 2014; Rauthmann et al., 2015; Sherman et al., 2013 and Sherman et al., 2015), the focus has been on the personality aspects of predicting behaviour. There have been various attempts in capturing the essence of a personality and its characteristics, and great interest has been shown in the field of personality psychology to examine how personality traits might influence human perception. One model that has achieved international validation suggests that personality consists of five basic traits: extraversion, agreeableness, openness to experience, conscientiousness and neuroticism. This assumption is what constitutes the main core of the Five-Factor Model (McCrae & Costa, 1999), also known as The Big Five. The authors of the current study acknowledge the significance of both predictor variables (perceptions of situations and personality traits) when examining their contribution to explaining the variance in individual differences in compliance.

The Situational Eight DIAMONDS → Compliance

Most psychological theories incorporate situational influences and a necessity for further investigation of dynamic person-situation transactions in the same experimental design to assess how different levels of situations and personality traits respectively affect and predict human behaviour, was identified a long time ago (Endler & Magnusson, 1976). In pursuit of moving the field forward, psychologists have conducted research to formulate core principles of what constitutes a situation, in order to describe, explain and predict person-situation transactions. That is, how people "construe, maintain, select, evoke, change and create situations in their daily lives" (Rauthmann et al., 2015). The taxonomy of the Situational Eight DIAMONDS enables the possibility to assess perceptions of particular situations, such as the Covid-19 pandemic, independently of personality traits by presenting dimensions on which psychological situations are evaluated and described (Rauthmann et al., 2014). There were no standardised and validated psychometric tools or taxonomies of major dimensions of situation characteristics until the development of the Situational Eight DIAMONDS, tailored by Rauthmann and colleagues from the Riverside Situational Q-Sort (RSQ), and a scale consisting of 32 items called the RSQ-8 to capture them. Descriptions of the Situational Eight DIAMONDS dimensions according to Rauthmann et al. (2014) are as follows:

Duty: The dimension of Duty strives to describe if and to what degree a situation is perceived to contain tasks to be done, work, meaningful duties, helping other people and solving problems. According to Rauthmann et al. (2014), dutiful situations were interpreted as task-oriented and limiting in positive socialisation, albeit common.

Intellect: Intellect depicts the extent to which people perceive a situation to hold the opportunity to demonstrate intellectual capacity, engage in daydreaming and deep reflection as well as cognitive demands.

Adversity: Adversity describes the amount of criticism, problems, threats and blaming a person perceives in a situation.

Mating: Mating describes to what extent a person perceives a situation to contain love, sex and romance. This includes maintaining mates as well as making a good impression and being accepted by potential new ones.

pOsitivity: pOsitivity captures the positive affective evaluations of a situation such as the amount of fun, pleasure, playfulness, simplicity it contains and how easy-to-navigate it is.

Negativity: Negativity, similar to the structure of positivity, describes the affective evaluations of negativity in a situation, rather than unhappiness as a whole. This alludes to feelings of anxiety, tension, guilt, frustration and anger to name a few.

Deception: Deception captures how people perceive a situation to contain hostility, deception, betrayal, lying and mistrust.

Sociality: Sociality describes the perceived amount of opportunity to socialise, engage in pleasant communication and relationships, as well as levels of reassurance and relational warmth.

With this framework, there is now the possibility to investigate individual differences in perceptions of situations in a systemic way, similar to how we analyse personality traits. Previous findings (Zajenkowski et al., 2020) have indicated that perceptions of the situation predict human behaviour more than personality traits. With this study there is an intention to investigate how the perception of the Covid-19 pandemic situation relates to the level of compliance people perceived themselves to have. A sense of duty may cause people to spring into action to do what is important and helpful to other people and the country as a whole by following guidelines to control the spread of Covid-19. Similarly, perceived negativity may urge people to be careful and therefore comply in order to feel safe from the virus. On the other hand, low perceptions of positivity, mating and sociality may lead people to comply less due to not wanting to distance themselves from other people.

Five-Factor Model → Compliance

In the search for a theory which could provide more answers to why individuals differ regarding their emotional, motivational, attitudinal, interpersonal and experimental way of being, factor analysts developed a taxonomy of personality scales consisting of five basic factors (McCrae & John, 1992). The distinction between what McCrae and Costa (1999) describe as basic tendencies and characteristic adaptations is what constitutes the focal point of the FFM. Basic tendencies can be defined as a category which includes the five dimensions of personality consisting of neuroticism, extraversion, openness to experience, agreeableness and conscientiousness. These factors in short can be described as abstract psychological potentials. In a further portrayal, the traits of the FFM should be viewed as deeper psychological entities that can only be deduced from human behaviour and experience. Characteristic adaptations can according to McCrae and Costa be portrayed as a reflection of an individual's abiding psychological core which helps the individual's adjustment to the dynamic social environment. These adaptations are influenced by external factors and by basic tendencies, which can be observed through attitudes, skills, roles, habits and relationships. The five dimensions of personality included in the FFM will be described in the following section according to McCrae and Costa (1999):

Neuroticism: Individuals who score high on this dimension tend to experience feelings such as guilt, sadness and hopelessness. Their characteristic adaptations tend to have a rather negative inclination, such as having low self-esteem, adopting a pessimistic point of view and have unreasonable perfectionistic beliefs. Overall, the basic tendency can be defined as depression, meaning that there is a propensity to experience dysphoria.

Extraversion: Another term describing this basic tendency is gregariousness which means that the individual feels the need for social stimulation and companionship. Individuals who score high on the scale of extraversion tend to develop numerous friendships with others and engage in practices such as vocational interests, sports and clubs.

Openness to Experience: The need for change, variety and novelty is what constitutes this dimension. The characteristic adaptations of individuals who score high on openness manifest themselves in interests such as hobbies, careers and curiosity to experience the world and attain knowledge of various cultures.

Agreeableness: Individuals who score high on agreeableness tend to adopt an optimistic approach to teamwork, have a forgiving demeanour and express themselves in an inoffensive language. They have a preference to comply and defer to others in the course of an interpersonal conflict, and other individuals might perceive them as pushovers.

Conscientiousness: This basic tendency consists of a strong sense of purpose and an achievement-oriented attitude. Individuals with high scores on this dimension might have great leadership skills, have their future planned ahead, possess technical expertise and are surrounded by an organised support network.

Additionally, researchers Nofal et al. (2020) argue that different personality traits must be considered when assessing the already implemented restrictions due to Covid-19 and for the ones that might be carried out in the future. Their results demonstrated that individuals with high scores on the conscientiousness dimension tended to comply with the set transmission mitigation behavioural guidelines to a higher extent. This can be helpful for the authorities since they can adapt their communication to the public in a way that triggers the desired personality trait by enhancing peoples' sense of belonging and commitment to their communities. Their study also suggests that agreeableness may be a predictor for a higher degree of compliance among women, while openness to experience positively influences compliance among

men (Nofal et al., 2020). Sheltering-in-place has been positively correlated with policy stringency for all of the five dimensions of personality, with the exception of extraversion which was negatively associated with staying indoors. However, neuroticism and openness to experience could predict less obedience to the sheltering-in-place as the restrictions became harsher, which further demonstrates the importance of personality in compliance when authorities introduced strict policies against undesirable behaviours (Götz et al., 2020).

Another study examined how personality traits had an impact on individuals' stress and coping reaction when they followed up on those present at a shooting emergency alarm (which turned out to be false) at a Swiss university (Hengartner et al., 2017). What they found was that high scores on the dimension of both agreeableness and conscientiousness were positively correlated to social activity after the emergency. Agreeableness was simultaneously shown to be negatively related to the use of medication. Individuals who scored high on neuroticism had a significantly higher experience of acute fear and traumatic distress along with a maladaptive coping strategy, a finding that goes hand in hand with the research of Witte and Allen (2000), and their postulation that defensive responses are due to experienced feelings of helplessness and a perception of an uncontrollable situation they cannot cope with. These results are important as they demonstrate how personality traits may influence how one perceives a situation, which in turn can affect how an individual copes with a threat - one alternative being to heed and comply with public health measures. Hence why further research is of significance as it can help governments develop effective measures in an endeavour to cope with various crises.

The relation between personality traits and perceptions of situations

Both personality traits and characteristics of a situation play a role in predicting human behaviour, and they do so independently as well as in relation to each other (Sherman et al., 2013; Sherman et al., 2015). Personality could influence the variability in how a situation is perceived, which has been supported by Serfass and Sherman (2013), who found that both objective properties of a situation and the individual's personality influenced how a situation was perceived. According to Jonason and Sherman (2020), perceptions, motivations and emotions are part of an internal system which makes up the personality. Further findings by Sherman et al. (2015) suggest that the situations people reported that they encountered were consistent with the differences in personality traits. People who feel happy tend to report situations characterised by high scores on the positivity dimension to a greater extent. The five dimensions of personality are related in systemic ways in how individuals perceive their surroundings. Findings indicate that high scores on the dimensions of agreeableness and extraversion tend to elicit a perception of a situation that is characterised by opportunities to socially interact with other people (Jonason & Sherman, 2020). Neuroticism predicts a higher perceived risk for conflict and exploitation in situations where dangers are not obviously present. On the contrary, high scores on the personality dimensions of openness and conscientiousness forecast a perception of the world as being safe. According to findings made by De Coninck et al. (2020) in Belgium, perceived vulnerability to Covid-19 is associated with a greater belief that the restrictions set by the authorities were made to keep the population safe. This was found mainly amongst people with high germ aversion. In conjunction with this discovery, they found that high agreeableness and low neuroticism could predict a more positive approach to the implemented restrictions. However, a perceived vulnerability was also related to a more critical stance towards the government's way of coping with the virus. Those who had a high perceived infectability did not find the measures sufficient and therefore supported policy stringency. According to Bavel et al. (2020), people who manifest an optimism bias (the belief that negative events are

less likely to occur to oneself) might underrate their susceptibility to diseases and therefore not pay much attention to public health warnings.

These findings demonstrate how perceptions of a situation and personality traits can affect and predict human behaviour independently as well as depict their potential correlation with each other. The authors of the current study acknowledge the importance of these variables in the attempt to achieve a greater knowledge of why some people comply with the implemented restrictions due to Covid-19, and some do not.

The current study

In Poland, Zajenkowski et al. (2020) studied how individuals' compliance with the Covid-19 restrictions implemented by their government could relate to personality traits and perceptions of the situation, respectively. To collect data of personality traits, the researchers used a scale measuring the traits included in the Five-Factor Model as well as the so-called Dark Triad traits (machiavellianism, narcissism and psychopathy). To measure individuals' perceptions of the situation, they used a scale based on the Situational Eight DIAMONDS. The predominant variable explaining the variance in compliance was perceptions of the situation. If the situation was viewed as negative and/or dutiful there was a greater tendency to comply with the restrictions, whereas a perceived situation characterised by romance, love and sex was associated with a lower degree of compliance. Their study also demonstrated an association between the five dimensions of personality and how an individual perceived the situation of Covid-19. Neuroticism was correlated to a negative view of the situation, whereas agreeableness and extraversion correlated to an experienced opportunity to socially interact with others. Conscientiousness was primarily associated with duty whereas openness was primarily associated with intellect. Their findings also suggested that people high on the scale of agreeableness tended to show greater compliance.

The authors of the current study have the ambition to replicate the research made by Zajenkowski et al. (with the exception of not including the Dark Triad traits as a predictor variable) for a sample from the Swedish population. Since the precautionary measures introduced by the governments of Poland and Sweden differ, there is a significant interest in examining the degree of compliance among Swedish citizens to observe if there is a noticeable discrepancy. The main aim of the current study is, therefore, to investigate how differences in personality traits and differences in how an individual perceives the current situation of Covid-19 among Swedish university students affect the overall compliance with the restrictions and recommendations applied by their government. Alongside the main aim of this study, an examination of potential correlations between dimensions of personality traits and perceptions of the situation will be conducted as it may illustrate patterns between characteristics of personality and how individuals perceive a situation, which may support previous research and potentially contribute with scientific knowledge to move the field forward.

The following questions and hypotheses were examined:
1. To what degree do the Swedish citizens comply with the restrictions and recommendations?
2. Perceptions of the situation explain more variance in compliance than personality traits.
3. Agreeableness is positively associated with compliance.
4. Duty is positively associated with compliance.
5. The association between dimensions of personality traits and perceptions of the situation can be hypothesised as follows;
   5a: Extraversion is positively associated with Sociality.
   5b: Neuroticism is positively associated with Negativity.

5c: Neuroticism is positively associated with Adversity.
5d: Openness to experience is positively associated with Intellect.
5e: Conscientiousness is positively associated with Duty.
6. How much of the variance in compliance can be explained by all predictor variables (sex, age, personality traits and perceptions of the situation)?

Method

Participants

The authors recruited participants by marketing the questionnaire of the study through four online communities on Facebook. Three of them were created specifically for students in higher education and consisted of up to 100 members, respectively. The fourth Facebook group was at the time of collecting the data estimated to have 155 000 members and a purpose of functioning as a community where women can seek support and encouragement from each other. The members of the communities described above were predominantly women. The only prerequisite demographic variable of the sampling was that the participants were currently enrolled in tertiary education in Sweden. This was mainly due to university students and related online forums being more accessible during the Covid-19 pandemic when the study was conducted. In the process of recruiting, a snowball sampling was conducted which yielded 106 fully completed answer sheets. The sample consisted of 78 women (73.6%) and 28 men (26.4%) with an age range of 17 to 48 years ($M = 25.30$, $SD = 5.64$). Since all questions were made compulsory in order to participate, none of the questionnaires were excluded due to partial dropout. The questionnaire contained no questions which could have been used by the authors of the current study or third parties to identify or recognise the participants, by which anonymity was guaranteed. The questionnaire was made available online for any volunteers who met the requirements, therefore no statistics were provided in order to calculate a response rate.

Measure

Data was collected with an online questionnaire in Swedish containing a total of 87 items across four different sections. The survey was primarily meant to assess the participants' personality traits and perceptions of the Covid-19 situation as well as their self-estimated compliance with the restrictions and recommendations set by Swedish authorities.

The first section consisted of two questions about the participant's sex and age to collect data for the two background variables that were analysed in the study. During the analyses, men were coded as 1 and women as 0.

The Big Five Inventory. The second section sought to measure the participants on the Big Five personality dimensions by using the 44-item Big Five Inventory (BFI) scale (Benet-Martinez & John, 1998; John et al., 1991; John et al., 2008), compared to the International Personality Item Pool (Donnellan et al., 2006) used in the study by Zajenkowski et al. (2020) which only contained 20 items. The BFI was preferred due to the number of items and their presumed ability to capture the personality dimensions thoroughly. A Swedish version was utilised in this study (Zakrisson, 2010). The participants were asked to provide to what extent each statement

applied to them on a scale from 1 (= *disagree strongly*) to 5 (= *agree strongly*). Each personality dimension was captured by 8-10 statements each: Extraversion (e.g., "I see myself as someone who is outgoing, sociable"), Agreeableness (e.g., "I see myself as someone who likes to cooperate with others"), Conscientiousness (e.g., "I see myself as someone who is a reliable worker"), Neuroticism (e.g., "I see myself as someone who worries a lot") and Openness (e.g., "I see myself as someone who is original, comes up with new ideas"). 16 out of the 44 items were reversed-scored items. Indexes were created by averaging all items for each domain including the reverse-scored items. The minimum and maximum score on each domain were 1 and 5, respectively. The dimension of Extraversion had a calculated Cronbach's alpha value of .86, Agreeableness .78 and Conscientiousness .71. The Cronbach's alpha value of Neuroticism and Openness were .83 and .78, respectively.

RSQ-8*. The third section consisted of the comprehensive scale of the RSQ-8*, containing 40 items to capture the Situational Eight DIAMONDS (Rauthmann & Sherman, 2016). The translation process was completed by one of the authors of this study from English to Swedish, and then back-translated into English by the other author. The translations showed a satisfying congruence. The measure was used to assess individual differences in perceptions of the Covid-19 pandemic situation by which the participants provided an estimate of how much each item was applicable to the Covid-19 situation on a scale from 1 (= *not at all*) to 7 (= *totally*). The scale consists of eight dimensions capturing characteristics of a situation, each containing five statements. Examples of statements within each dimension are as follows: Duty ("A job needs to be done"), Intellect ("There is the opportunity to express unusual ideas and points of views"), Adversity ("I am being threatened by someone or something"), Mating ("The situation is sexually charged"), pOsitivity ("The situation is pleasant"), Negativity ("The situation is unpleasant"), Deception ("Not dealing with others in an honest way is possible") and Sociality ("Social interaction is possible"). One item within the dimension Mating ("Members of the opposite sex are present") was slightly rephrased as per recommendation by the developers of the scale (Rauthmann et al., 2014) to be more inclusive and pertain to all individuals and not just heterosexuals. Indexes were created by averaging all items for each dimension with a minimum score of 1 and a maximum score of 7. The dimension of Duty had a Cronbach's alpha of .87, Intellect .75, Adversity .82 and Mating .83. pOsitivity had a calculated Cronbach's alpha value of .67, Negativity .90, Deception .85 and Sociality had a Cronbach's alpha of .72.

Compliance. The last section contained just one item aiming to capture individual differences in compliance with the Swedish governmental recommendations and restrictions (Zajenkowski et al., 2020). The participants were asked in Swedish to provide the percentage (on a scale of 1 – 100) to which they considered themselves to comply with the recommended guidelines and restrictions during the Covid-19 pandemic.

Procedure

The online questionnaire was made available in November 2020 for a period of four weeks. Participation in the present study was voluntary and estimated to take 15-20 minutes which was communicated in the written cover letter. Participants were notified that compensation for completing the questionnaire was a 2 SEK donation, from the authors of the current study to the organisation Doctors Without Borders in their work battling Covid-19. This information was used when advertising the survey online. Furthermore, the cover letter informed the participants of the aim of the study and that the material was to be handled anonymously. Furthermore, they were also notified that the material was to be used for scientific purposes only and

the collected information deleted after the analysis was completed. The participants answered two background questions before providing to what extent they agreed with statements regarding their personality traits in a second section. In a third section, they were to fill out to what extent each statement was applicable to the Covid-19 pandemic in their perception. In a last and final question, they were to rate in percentage how much they felt they had complied with the Swedish governmental restrictions and recommendations. They received a written thank you for their participation upon completion of the questionnaire.

Data Analysis

After collecting the questionnaires, the authors transferred, prepared and analysed the data in a computer program made for statistical analysis that is known as IBM SPSS Statistics. Due to a relatively small number of participants, the alpha value for statistical significance was set to $p < .10$. No extreme values were observed in the data material. In order to answer the first question of the study, a mean value and a standard deviation of the dependent variable was calculated. The authors estimated the grand mean of compliance among the participants and mean differences between the sexes regarding compliance were calculated. In regard to the second question, two separate hierarchical linear regression analyses were conducted in order to separate the potential effects of personality traits and perceptions on compliance. The background variables consisting of age and sex were entered in Step 1 and were held constant during both analyses. Extraversion, agreeableness, conscientiousness, neuroticism and openness was entered at Step 2 in the first regression analysis, whereas duty, intellect, adversity, mating, positivity, negativity, deception and sociality were entered at Step 2 in the second regression analysis. The tolerance value was examined to exclude the risk of multicollinearity before the analyses were conducted. The third and fourth questions as well as questions 5a-5e were answered by examining potential correlations using Pearson's product-moment correlation coefficient. The sixth and final question of the study was answered through the application of a simultaneous multiple linear regression analysis, where all predictor variables were entered at the same time.

Results

Regarding the first question, the average percentage of compliance with the restrictions and recommendations in the current sample was approximately 77% ($M = 76.79$, $SD = 21.19$), see Table 1. A significant negative correlation between sex and compliance was exhibited which indicates that men complied less to the restrictions and recommendations than women ($r = -.35$, $p < .001$). The effect size for this correlation ($d = 0.76$) is close to Cohen's proposition for a large effect ($d = 0.80$). To further examine the difference, an independent samples t-test was conducted between the sexes in relation to compliance. Levene's test for equality of variances indicated that the variances in sex were not equal ($F_{1,105} = 6.03$, $p = .016$), therefore the t-statistic was not assuming homogeneity. The t-test could conclude that women ($M = 81.23$, $SD = 17.20$) generally estimated a greater compliance with the restrictions and recommendations compared to men ($M = 64.43$, $SD = 26.22$), and the analysis yielded statistical significance ($t_{35,683} = 3.16$, $p = .003$). The correlation between age and compliance was nonsignificant.

Table 1

Correlations between variables with descriptive statistics

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Compliance	76.79	21.19	-						
2. Sex[a]	n/a[b]	n/a	-.35***	-					
3. Age	25.30	5.64	.12	-.03	-				
4. Extraversion	23.96	5.72	-.08	.19*	.09	-			
5. Agreeableness	32.50	4.70	-.13	-.08	-.15	.20**	-		
6. Conscientiousness	30.81	4.60	.15	-.27***	.01	.23**	.15	-	
7. Neuroticism	21.04	5.63	.04	-.37***	.07	-.32***	-.25**	-.13	-
8. Openness	32.05	5.80	.02	.07	-.20**	.22**	.11	-.07	-.08
9. Duty	24.02	5.03	-.06	-.00	-.04	.07	.25**	.17*	-.06
10. Intellect	17.25	5.51	-.16	.11	.10	.19*	.07	.12	-.18*
11. Adversity	9.74	5.71	-.15	-.17*	.19*	-.11	-.18*	-.03	.28***
12. Mating	18.78	7.14	-.04	-.03	-.19*	.09	.15	.14	-.04
13. pOsitivity	10.23	4.93	-.07	.27***	.11	-.07	-.16	-.05	-.02
14. Negativity	22.86	6.12	.13	-.47***	.18*	-.17*	-.13	.10	.39***
15. Deception	17.33	6.98	-.01	-.20**	.07	.07	-.06	.11	.02
16. Sociality	21.94	5.47	-.00	.06	.09	.10	.17*	.04	-.17*

Note. $N = 106$. *$p < .10$, **$p < .05$, ***$p < .01$.

[a] Men were coded as 1 and women as 0.

[b] Not Applicable

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Table 1

Continued

Variable	8	9	10	11	12	13	14	15
1. Compliance								
2. Sex[a]								
3. Age								
4. Extraversion								
5. Agreeableness								
6. Conscientiousness								
7. Neuroticism								
8. Openness	-							
9. Duty	.04	-						
10. Intellect	.12	.29***	-					
11. Adversity	.12	.03	.09	-				
12. Mating	.13	.16*	.15	.11	-			
13. pOsitivity	-.05	.01	.11	-.10	.08	-		
14. Negativity	-.14	.02	-.13	.39***	.04	-.20**	-	
15. Deception	.05	.17*	.18*	.37***	.17*	-.11	.41***	-
16. Sociality	.11	.10	.10	-.27***	.12	.22**	-.15	.05

Note. $N = 106$. *$p < .10$, **$p < .05$, ***$p < .01$.

[a] Men were coded as 1 and women as 0.

[b] Not Applicable

Regarding the second hypothesis, two separate hierarchical multiple regression models were used to assess the ability of the Big Five personality traits and perceptions of the situation to predict compliance with Covid-19 restrictions and recommendations respectively and on equal terms. Sex and age were entered at Step 1 in both regression models, explaining 14% of the variance in compliance which was statistically significant ($p = .001$). In Table 2, the model predicting compliance with the Big Five personality traits was statistically significant ($F_{7,98} = 3.20$, $p = .004$). After entry of the Big Five personality traits at Step 2 the total variance explained by the model as a whole was 19%. This was an additional 5% explained variance compared to age and sex at Step 1, however, the R square change was nonsignificant ($p = .300$). In the final model, sex was statistically significant ($\beta = -19.10$, $p < .001$) showing that when it changed from 0 (women) to 1 (men), compliance decreased which suggests that men complied less. Agreeableness showed a tendency to be statistically significant, predicting less compliance ($\beta = -.83$, $p = .064$).

Table 2

Hierarchical multiple regression model predicting compliance with the Big Five personality traits

Variable	Step 1		Step 2	
	β	*SE*	β	*SE*
Step 1:				
Sex[a]	-16.66***	4.39	-19.10***	5.14
Age	.41	.34	.42	.36
Step 2:				
Extraversion			-.25	.39
Agreeableness			-.83*	.44
Conscientiousness			.28	.47
Neuroticism			-.62	.40
Openness			.30	.35
Model *F*	8.04***		3.20***	
(df)	(2, 103)		(7, 98)	
R^2	.14***		.19	
ΔR^2			.05	

*Note. N = 106. *p < .10, **p < .05, ***p < .01.*
[a] Men were coded as 1 and women as 0.

In Table 3, the model predicting compliance with perceptions of the situation was statistically significant ($F_{10,95} = 2.51$, $p = .010$). A total of 21% of the variance in compliance could be explained by the model as a whole. Perceptions of the situation entered at Step 2 explained, after controlling for age and sex at Step 1, an additional 7% of the variance which was statistically nonsignificant ($p = .362$). In the final model, sex was statistically significant ($\beta = -17.90$, $p = .001$) and predicted less compliance when it changed from 0 (women) to 1 (men), indicating that men complied less than women. Age showed a tendency to be statistically significant ($\beta = .68$, $p = .073$), and adversity was statistically significant ($\beta = -.99$, $p = .017$).

Table 3

Hierarchical multiple regression model predicting compliance with perceptions of the situation

Variable	Step 1		Step 2	
	B	*SE*	*B*	*SE*
Step 1:				
Sex[a]	-16.66***	4.39	-17.90***	5.05
Age	.41	.34	.68*	.38
Step 2:				
Duty			-.10	.41
Intellect			-.44	.39
Adversity			-.99**	.41
Mating			.12	.29
pOsitivity			.02	.43
Negativity			-.04	.41
Deception			-.10	.33
Sociality			-.26	.39
Model *F*	8.04***		2.51***	
(df)	(2, 103)		(10, 95)	
R^2	.14***		.21	
ΔR^2			.07	

Note. $N = 106$. *$p < .10$, **$p < .05$, ***$p < .01$.
B = Unstandardised coefficients.
[a] Men were coded as 1 and women as 0.

Regarding the third hypothesis which was tested by performing a correlation analysis, a one-tailed test showed that there was a tendency to statistical significance which indicated that the individuals who were more agreeable, tended to comply less ($p = .098$). This coincides with findings in the hierarchical regression model where the Big Five personality traits were entered in Step 2. The negative association contrasted with the postulated hypothesis of a positive association between the two variables. As for the fourth hypothesis, no statistically significant support was found to suggest that duty is positively associated with compliance according to a one-tailed test ($p = .277$).

Regarding the fifth hypothesis, 5a-5e are all one-tailed hypotheses and will be accounted for as such. No statistically significant support was found for hypothesis 5a ($p = .146$). Hypothesis 5b was statistically significant ($p < .001$), indicating that the individuals who were high on neuroticism showed more negativity. Additionally, statistically significant support was found for hypothesis 5c ($p = .002$). This suggests that those who perceived themselves to be high on neuroticism also reported a higher degree of adversity. No statistically significant support was found for hypothesis 5d ($p = .106$). Hypothesis 5e was statistically significant ($p = .040$), which is an indication that individuals who reported themselves to be higher in conscientiousness, also perceived a sense of duty in the situation.

In order to answer the sixth and therefore last question of the study, a simultaneous multiple regression analysis was conducted (see Table 4). The results of this analysis indicate that all predictors explained approximately 28% of the variance in compliance, and the model yielded significance ($F_{15,90} = 2.30$, $p = .008$). However, only four variables (age, sex, agreeableness and adversity) were significant when the significance level was set to .05. There was also a tendency to significance regarding the variable openness when the significance level was set to .10.

Table 4

Simultaneous multiple regression model predicting compliance

Variable	B	SE	β
Sex[a]	-19.62***	5.57	-.41***
Age	.79**	.39	.21**
Extraversion	-.30	.39	-.08
Agreeableness	-.98**	.47	-.22**
Conscientiousness	.27	.47	.06
Neuroticism	-.49	.42	-.13
Openness	.61*	.36	.17*
Duty	.10	.42	.02
Intellect	-.51	.39	-.13
Adversity	-1.15***	.43	-.31***
Mating	.16	.29	.05
pOsitivity	-.09	.43	-.02
Negativity	.05	.42	.01
Deception	.00	.34	.00
Sociality	-.26	.40	-.07
Model F	2.30***		
(df)	(15, 90)		
R^2	.28***		

Note. $N = 106$. *$p < .10$, **$p < .05$, ***$p < .01$.

B = Unstandardised coefficients; SE = Standard error of B; $β$ = Standardised coefficients.

[a] Men were coded as 1 and women as 0.

Discussion

The main aim of the current study was to examine how differences in personality traits and differences in how an individual perceives the situation of the Covid-19 pandemic among Swedish university students affect the overall compliance with the restrictions and recommendations applied by their government. In addition, potential correlations between dimensions of personality traits and perceptions of the situation were examined as it may illustrate consistent patterns between personality and how individuals perceive a situation. These may support previous research and potentially contribute with scientific knowledge to move the field forward. The results revealed that the individuals perceived their compliance to be fairly high, in particular the women. Neither personality traits nor perceptions of the situation could predict or explain the variance in compliance with behavioural guidelines. However, in analyses that included the background variables age and sex, both groups of predictors could explain a similar percentage of compliance, and all variables assessed together could account for 28% of the variance in compliance. Agreeableness showed a tendency to a negative association with compliance, whereas no support for a correlation between duty and compliance was found. As for associations between specific variables in personality traits and perceptions of the situation, neuroticism was positively associated with negativity and adversity, and conscientiousness positively associated with duty. No support for associations between extraversion and sociality as well as openness to experience and intellect were found.

Regarding the first question of the study, the individuals reported themselves to be compliant to a mean degree of 77%. The women (81%) were found to be more compliant than men (64%) with a significant difference – a finding which falls in line with other studies conducted

regarding the Covid-19 pandemic. Along with previous research it contributes to a deeper understanding of gender differences in compliance with government policies during crises. Galasso et al. (2020) found important gender differences in attitudes, beliefs and behaviour in samples from eight different countries in which women perceived the pandemic as a more serious health problem and complied to public health measures more than men. This may in part be due to women being more risk-averse than men, as consistently found in research (Croson & Gneezy, 2009; Friedl et al., 2019).

For the second hypothesis, the ability of the Big Five personality traits and individual perceptions of the Covid-19 situation to predict compliance was assessed, in which, together with age and sex, both models indicated a significant explained variance of similar value: 19% and 21%, respectively. However, the explained variances for the Big Five personality traits and perceptions of the situation after controlling for age and sex, were similar, low and statistically nonsignificant. The difference in R squared change between them was not tested for significance but is likely nonsignificant. These findings indicate that neither of these two groups of predictor variables could account for explained variance in individual differences in compliance with restrictions and recommendations. This is in contrast to the results of the study in Poland by Zajenkowski et al. (2020), in which it was found that perceptions of the situation could explain more variance in compliance and could be due to the small sample in this study. The only variable out of the dimensions for perceptions of the situation which was statistically significant was adversity, which suggested that the more adversity the individuals perceived in the Covid-19 situation, the less compliant they reported themselves to be. This may indicate that individuals who comply with behavioural guidelines do not perceive themselves to be on the receiving end of criticism and blame in the situation, potentially due to them following the implemented policies. On the other hand, it may imply that the lower degree of adversity made it easier for them to comply. Out of the Big Five personality traits, agreeableness showed a tendency to statistical significance in predicting less compliance. This finding corresponds with the negative association found in the correlation analysis, suggesting that the more agreeable a person provided themselves to be, the lower degree of compliance was reported. This contrasts with hypothesis 3 of a positive association between the two - a hypothesis supported in previous findings (Nofal et al., 2020; Zajenkowski et al., 2020). As discussed in their studies, agreeable people may tend to care for and help others and therefore comply with restrictions and recommendations during a pandemic. According to McCrae and Costa (1999), agreeable people tend to have a preference to comply and work as a team. The finding in this study that agreeable people comply less may be the result of a small sample. It may also depend on whom agreeable individuals comply with. As suggested by Roccas et al. (2002), agreeable people may be prone to follow the norms in a society. However, Roccas et al. also argue that agreeableness is compatible with the concern of other people's well-being with whom one has an established personal relationship. As the Swedish restrictions and recommendations have been less strict than in many other countries, leaving room for peoples' own decision-making and responsibilities, agreeable people may comply with people around them, rather than guidelines implemented by the Swedish authorities. The authors want to highlight the result of the negative association, albeit a weak one, between agreeableness and compliance. It suggests that individuals who score high on agreeableness may be more inclined to conform to significant others. With further research, this finding may contribute to a deeper understanding of agreeableness as a personality dimension. In addition to the third hypothesis, according to a one-tailed test revealing a tendency to significance, individuals who scored higher on conscientiousness complied more, which coincides with findings by Nofal et al. (2020). Sherman et al. (2013) found that people who were high on conscientiousness viewed situations to be more relevant to their health, which supports the results in the current study. These findings further correspond with the result

of this study that women, who complied more than men, also scored higher on conscientiousness.

Regarding the fourth hypothesis postulating that individuals who perceived the situation as dutiful complied more, as supported in the study by Zajenkowski et al. (2020), the results of the present study showed a negative association, albeit nonsignificant. Similar to how agreeableness showed a tendency to a negative correlation with compliance, the fact that the Swedish government did not implement many strict behavioural guidelines which perhaps would have evoked feelings of duty and a sense of agreeableness, individuals complied with those around them rather than authorities. However, in accordance with the study of Zajenkowski et al. (2020), there was a tendency to statistical significance indicating that those who viewed the situation as more negative, complied to the restrictions and recommendations more. This may be due to the affective evaluations of negativity during the pandemic, causing people to comply with restrictions and recommendations to feel safe and lessen feelings of anxiety and stress. Both intellect and adversity showed, with the use of one-tailed tests, a tendency to a negative association with compliance. These findings are noteworthy as, aforementioned regarding adversity, those who comply with behavioural guidelines may perceive less criticism and may also from the start have found it easier to comply due to not feeling blamed or threatened in the situation. This could be in relation to one's individual rights regarding the limitations and changes in behaviour during the pandemic. As for intellect, it may allude to a sense of not needing to reflect on or express one' own values and ideas, but to listen to the experts in the field and comply. These interpretations fall in line with previous research revealing the Swedish people's trust in their government (Helsingen et al., 2020).

For hypothesis 5a-5e, correlations between specific variables in the two different measures of personality traits and perceptions of the situation were investigated. No support was found to indicate that extraversion is positively associated with sociality (hypothesis 5a), as found in previous research (Jonason & Sherman, 2020; Zajenkowski et al., 2020). This may be due to the participants in the current study being university students who had to start distance learning which may have resulted in all of them going through a similar drastic change in social activities in everyday life. The dimension of sociality measures an individual's perceived amount of opportunities to socialise and engage in relationships with others, and individuals who score higher on extraversion may be impacted more in a negative way by this change. As hypothesised, neuroticism was found to be positively associated with both negativity and adversity (hypothesis 5b and 5c) which is consistent with traits of neuroticism and how it associates with perceptions of the situation in previous research (Jonason & Sherman, 2020; Zajenkowski et al., 2020). This suggests that those who are high on neuroticism perceive more danger and hardships in a situation where others do not. Openness to experience was not found to be positively associated with intellect (hypothesis 5d), which has been found in previous research (Serfass & Sherman, 2013; Zajenkowski et al., 2020), and may be due to the small sample of this study. The hypothesis (5e) that those who are high in conscientiousness (and therefore purposeful and achievement-oriented) perceived a sense of duty in the Covid-19 situation was supported with a one-tailed test, a positive association also found by Zajenkowski et al. (2020). Another result of their study found in the current one is the positive correlation between agreeableness and duty. Both correlations fall in line with the theoretical framework of the two personality traits and what the perception of duty in a situation entails, such as helping other people and having tasks to be fulfilled.

Lastly, for question 6, all predictor variables, with statistical significance, explained approximately 28% of the variance in compliance simultaneously. Age, sex, agreeableness and adversity were the only variables which could significantly predict compliance in individuals. The results of sex, agreeableness and adversity coincide with the correlation analysis in this study and those in the regression models when the variables were entered in steps, which indicates

that women who are less agreeable and perceived less adversity in the Covid-19 situation, complied more to restrictions and recommendations.

Strengths and limitations

A strength of this study is the internal consistency of the scales used for capturing personality traits and perceptions of the situation. Through the instrumentality of Cronbach's alpha, the dimensions of BFI and RSQ-8* obtained a coefficient alpha higher than the conventional value of .70. This is with the exception of the dimension positivity (RSQ-8*) which was assessed to have an alpha value of .67. When the RSQ-8* was constructed, all dimensions obtained satisfactory alpha values higher than .70 (Rauthmann & Sherman, 2016). Why it differs in the current study can only be speculated. As the RSQ-8* is a relatively new scale, there was no translated Swedish version offered. This led the authors of the study to conduct a translation of the scale from English to Swedish, which could form a threat to the reliability of the study as well as be a possible explanation to why the dimension positivity obtained a Cronbach's alpha coefficient lower than .70. Having this in mind, the authors argue that the overall reliability of the study can be considered satisfactory.

The ambition of the current study was to replicate the study by Zajenkowski et al. (2020), however, one predictor variable (The Dark Triad), was excluded in the current study for the reason of limited resources and time. No extreme cases were observed in the data material, ruling out the possibility of outliers. Since there were no partial dropouts in the collected data, there is no suspicion of mortality which can otherwise threaten the internal validity. The predictors in the simultaneous regression analysis could explain approximately 28% of the variance in compliance, which according to Falk and Miller (1992), exceeds the criterium of an acceptable coefficient of determination ($\geq$ .10). When gathering the data, the constructed questionnaire did not contain the question of whether the participant was considered to be in the risk group or not. In hindsight, the authors of the study acknowledge that it would have been an imperative variable when predicting the dependant variable. Therefore, it can be interpreted as a possible confounding variable in relation to the Situational Eight DIAMONDS, as the perception of the situation may be influenced by one's physical vulnerability. Another possible limitation is that the questionnaire did not contain any questions measuring the participant's awareness of the existing restrictions and recommendations. The degree of compliance may be affected by how up to date one is with the behavioural guidelines, as they changed over time depending on the development of the situation, and it is possible that taking this into account could have explained further variation in compliance. Covid-19 as a situation happens on a societal level and despite not everyone having been directly impacted by it, the implemented restrictions and behavioural guidelines altered people's everyday lives on a micro level. Therefore, the authors of the current study support Zajenkowski et al. (2020) in their opinion that Covid-19 can be viewed as a concrete situation, which makes the RSQ-8* scale an appropriate measure to assess perceptions of the situation. To capture individual differences in compliance, a single question was used, formulated in a way that allowed for interpretations which may have affected the reliability of the measurement. In addition to this, it is noteworthy that compliance in this situation may be desirable and therefore, may have influenced the self-evaluation. A possible solution to these points may have been to expand the scale adding several items to measure compliance with the restrictions and recommendations by, as it could have increased the validity of the study. This was considered in an early stage of the study and the authors decided to use the same item used in the reference study in order to stay consistent. Furthermore, it should be noted that single-items used for measuring a construct can very well satisfy the criteria of validity and reliability. According to Jordan and Turner (2008), single-

items are appropriate if it suits the research design and the construct that is under examination is considered to be concrete.

The main limitation of this study was the sample size consisting of only 106 participants, which was particularly noteworthy in comparison to the number of predictor variables. Schönbrodt and Perugini (2013) claim that correlations tend to stabilise when the total number of cases approaches 250. Considering that the sample consisted of people in the age range of 17 to 48 years, it is important to highlight that the results may have been different if older or younger individuals would have participated in the study, since their experiences with Covid-19 may differ from the current age group. In addition, it is important to note that the variance of the sexes was not equal regarding compliance, and there were only 28 males participating (constituting 26.4% of the sample). Unequal sample and unequal variance can affect a study's statistical power negatively and increase the risk for Type I error (Rusticus & Lovato, 2014). Therefore, it should be considered a threat to the internal validity. As the sample predominantly consisted of women recruited through a convenience and snowball sampling, it is not possible to generalise the results to the general population nor university students in Sweden. However, the difference between the sexes in relation to compliance was statistically significant ($p <$ .001) and the effect size could be interpreted as fairly large ($d = 0.76$). This finding supports previous research and can therefore contribute to the psychological framework of gender differences in compliance. The authors of the current study decided to note results that signalised a significance value of $< .10$. This is due to relatively few respondents and a conjecture that the results may yield significance at the 5%-level if the sample size was to be increased. The results of this study could be of value for future replications containing larger samples. The authors find it of the utmost importance to include risk group and awareness of restrictions and recommendations as predictor variables.

Conclusion

The overall compliance among university students in Sweden could be estimated to a mean of 77%. Women generally tended to adapt to and follow the behavioural guidelines to a greater extent than men, which supports previous research. The interpretations of the results in this study are made with caution due to the methodological weakness of measuring compliance with a single-item which may have resulted in ambiguous figures, as well as the use of a small sample. All the predictors could account for approximately 28% of the variance in compliance, which can be viewed as an acceptable determination coefficient. Even so, only the background variables (age and sex) entered at Step 1, were significant and could explain 14% of the variance in compliance. This implies that the findings of the current study could not support the assumption that personality traits or the perception of the situation can contribute to an explanation of the variance in compliance, which has been observed in previous research. Surprisingly, agreeableness showed a tendency to significance in being negatively associated with compliance, which the authors argue may be due to a small sample or individuals complying more with people in their immediate surroundings (who may not follow the restrictions and recommendations). The personality dimension conscientiousness showed a tendency to a positive association with compliance, which was not included in the hypotheses but can be supported by previous findings. The association between duty and compliance could not be ascertained as it was nonsignificant. However, intellect and adversity showed a negative association with compliance when conducting a correlation analysis. The authors suggest that due to the citizen's trust in the Swedish government, the situation may feel safer and therefore, does not evoke the need for further reflections on the implemented measures, which results in greater compliance. No association between extraversion and sociality nor openness to experience and

intellect could be ascertained. As hypothesised, neuroticism was positively associated with negativity and adversity, and conscientiousness was positively associated with duty. Lastly, all predictor variables could account for approximately 28% of the explained variance in compliance. The results of the current study are of importance not least in a preparatory matter but also from a theoretical perspective. It provides further support for previous research that has demonstrated gender differences in compliance. A possible contribution to personality psychology has been made, on account of the current study, which offers a deeper understanding of agreeableness as a personality dimension. The authors express the importance of future replications of the study to contain a larger sample in which risk group and the awareness of the restrictions and recommendations, are included as independent variables. The information which can be obtained by including individual differences in personality traits and how individuals perceive the situation is essential in a preparatory purpose for governments to efficiently cope with future threats. Hence why it is of great interest to conduct further replications in countries with other transmission mitigation measures to see which course of action yields the best outcome regarding reducing the threat.

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