

The Effect of Machiavellianism on Covid Rule-Breaking Moderated by Risk-Group

Aline Moore Lorusso

SNR: 2026137

Forensic Psychology, School of Social and Behavioral Sciences, Tilburg University

BSc Psychology

Supervisor: Eva Billen

Second Reader: Alexandra Hering

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Abstract

Previous research found differences in compliance with Covid related rules caused by individual differences. Due to characteristics of Machiavellianism (such as selfishness and rule-breaking behavior), it was investigated whether scoring high on Machiavellianism predicts disregard of the pandemic measures. However, the self-oriented nature of Machiavellianism could be reflected as well by adherence to the Covid rules in order to protect oneself from the virus. Therefore, it was hypothesized that being part of a Coronavirus risk group and consequently, having a stronger desire not to get infected, would moderate this relationship. This implied that it would be weaker for individuals scoring high on Machiavellianism who were part of a Covid risk group and stronger for those who were not part of the risk group. The study was executed with 769 participants who were mainly female (71%) and Dutch (75%), with an average age of 32.35. They filled out an online questionnaire that measured Machiavellianism, Covid rule-breaking, and being part of a risk group. A moderation analysis was performed, and the results showed that Machiavellianism could not be identified as a predictor of Covid rule-breaking. Furthermore, being part of a risk group did not moderate this effect when controlling for age and gender. Therefore, it can be assumed that the Machiavellian strategic reasoning prevented rule infringement. Consequently, future research should investigate the role of this characteristic and whether specific framing of Covid measures can increase compliance of psychopathy and narcissism rather than Machiavellianism.

Keywords: Machiavellianism, Covid-19, pandemic, rule-breaking, risk group, life-history theory

Introduction

December 2019 was marked by the start of the outbreak of the Coronavirus pandemic that soon affected people worldwide, being responsible for numerous deaths currently reaching approximately 2.6 Million (World Health Organization, 2021a). What originated with single cases of pneumonia in Wuhan (Ren et al., 2020; Zhu et al., 2020) caught the world off guard, forcing radical and dynamic changes for governments and individuals around the globe.

According to the World Health Organization (2020b), the pandemic's origins can be traced back to the Huanan South China Seafood Marketplace. This novel Coronavirus disease (COVID-19) is especially harmful to the elderly, patients with cardiovascular diseases, diabetes, cancer, and/or chronic respiratory diseases (World Health Organization, 2020a). Its spreading occurs mainly through sneezing and coughing (World Health Organization, 2020c), leading governments to adopt measures including preventive measures (e.g., wearing masks, washing hands frequently; World Health Organization, 2021b) and containment measures (e.g., social distancing, stay-at-home orders, curfew, limiting mass gatherings, traveling restrictions; Singh et al., 2020).

Subsequently to these measures coming into effect, it became evident that not everyone adheres to the COVID-19 rules to the same extent (Norman et al., 2020). Individual differences of compliances of the enforced rules could be detected. For instance, people more likely to break these rules were men (Galasso et al., 2020), individuals scoring high on psychological entitlement (Zitek & Schlund, 2021), or low on conscientiousness (Carvalho et al., 2020; Zajenkowski et al., 2020). Therefore, it seems plausible to assume that further individual differences can explain discrepancies regarding adherence towards the aforementioned measures, such as individuals scoring high on disregard for rules. Similarly, low empathy levels, antisocial

attitudes, and selfishness could translate into a lack of caring to prevent others from being infected by the Coronavirus.

Due to these assumptions, it might be interesting to look at individuals scoring high on the personality traits of the Dark Triad (which comprises the personality traits of Machiavellianism, narcissism, and psychopathy; Paulhus & Williams, 2002). In fact, the Dark Triad has a predictive effect on delinquency (Wright et al., 2016), criminal offending, and victimization (Flexon et al., 2016), showing that people with these personality traits do not seem to care about breaking societal rules. As a matter of fact, it correlates positively with disregard for rules (Paulhus & Williams, 2002), engaging in more antisocial activities (James et al., 2014), lack of empathy (Jonason et al., 2013; Porter et al., 2014), and selfishness (Kaufman et al., 2019). Specifically, regarding Covid-19 measures, Nowak et al. (2020) found a negative correlation between the Dark Triad and prevention. Instead of preventing, individuals scoring high on the Dark Triad were more likely to hoard. These findings are explained by a stronger perception of perceived barriers against prevention, meaning that the Dark Triad correlated positively to being more concerned about the negative aspects of engaging in preventive behavior rather than its benefits. Furthermore, it is argued that this effect could be explained by the higher levels of selfishness of the Dark Triad. In fact, hoarding can be considered a selfish behavior since it prevents others from having access to supplies during the pandemic while engaging in preventive measures can be considered a prosocial behavior. The Dark Triad's strong self-interest can also explain the high concern regarding the negative aspects of prevention. The perceived barriers that come with it mainly have a freedom-limiting character, meaning that individuals scoring high on the Dark Triad have a stronger focus on the personal disadvantages of engaging in preventive behavior rather than its selfless advantages of protecting others.

Moreover, the research of Espinosa and Clemente (2021) found that the Dark Triad has a predictive effect on non-compliance regarding Covid rules, being the strongest for psychopathy, then for Machiavellianism, and lastly for narcissism. The correlation is explained by a lack of empathy and a self-maximizing attitude. Furthermore, an association between Machiavellianism, primary psychopathy and narcissistic rivalry, and Covid rules infringement was found (Zajenkowski et al.,2020). Added to that, Triberti et al. (2021) also showed the existence of a positive relationship between the Dark Triad and breaking these rules. Their findings also included that specifically individuals scoring high on Machiavellianism, are less prone to avoid social interaction, contact with people, and keep on living their lives as before the pandemic.

Although previous research already shined some light on the associations between the Dark Triad (including Machiavellianism itself) and non-compliance of Covid-19 measures, literature did not put a strong focus on the Machiavellian construct alone. Machiavellianism distinguishes itself from psychopathy and narcissism by not correlating with certain aspects such as risk-taking behavior (Malesza & Ostaszewski, 2016b), impulsivity (Malesza & Ostaszewski, 2016a), and aggression (Jones & Paulhus, 2010). These differences could be relevant for Covid-rule compliance, since, for instance, impulsivity predicts Covid rule infringement (Espinosa & Clemente, 2021). Consequently, psychopathy and narcissism might be stronger predictors of pandemic rule-breaking. Additionally, Machiavellianism is related to being strategic, calculating, long-term reasoning, and cautious (Jones, 2016), which could predict being more careful at committing pandemic rules compared to the risk-taking psychopathic and narcissistic personality trait. It, therefore, might be of interest to investigate Machiavellianism's predictive effect on its own and dig deeper into this construct's reasoning behind the possible disregard of the pandemic's rules.

More in general, Machiavellianism is a psychological construct coined by Christie and Geis (1970). The Machiavellian personality entails a strong orientation toward personal goal attainment, which is oftentimes obtained through manipulation, callousness, antisocial behavior, exploitation, and deception (Christie and Geis, 1970; Jones & Paulhus, 2009; Jones & Figueredo, 2013; Jones, 2016). Individuals with Machiavellian dispositional tendencies also score high on cynicism (Jones & Paulhus, 2009), low empathy (Barnett & Thompson, 1985; Bagozzi et al., 2013), and neglect of moral rules (Christie & Geis, 1970). Research into cynicism (Tong et al., 2020; Zajenkowski, 2020), callousness, deceitfulness, and low empathy (Miguel et al., 2021; Pfattheicher et al., 2020) have shown a negative relationship with following preventive measures for Covid-19. In fact, the Machiavellist's selfish nature (Jones, 2016) and their empathy-lacking dedication to achieve their goals, could suggest that individuals high in these personality traits do not hesitate to commit violations of Covid rules, since they are not strongly concerned with the consequences it could have on other people. This was shown in the study from Dinić and Bodroža (2021), where a negative relationship between selfishness and compliance for protective Coronavirus measures was found. They also individuated empathy as having a positive indirect effect on engaging in preventive behavior. Furthermore, individuals with Machiavellian tendencies score low on agreeableness and conscientiousness (Jakobwitz & Egan, 2006), which are positively correlated to adherence to the pandemic rules (Carvalho et al., 2020; Zajenkowski et al., 2020). Additionally, Machiavellianism is negatively correlated with prosocial behavior (Berger & Palacios, 2014), which is a predictor of following the Covid physical distancing guidelines and staying home when sick (Campos-Mercade et al., 2020).

When explicitly looking into unethical behavior within Machiavellianism, research shows that this personality trait correlates with cheating and stealing in settings with low chances of

getting caught (Bogart et al., 1970; Harrell & Hartnagel, 1976), being more successful at lying and committing fraud (DePaulo & Rosenthal, 1979), having less ethical perceived levels of social norms (Shafer & Wang, 2017), misconducting academically and generally breaking rules (Ternes et al., 2019). Their neglect of moral rules and use of antisocial behavior should translate in the Coronavirus environment as well. This was shown in the study from Nivette et al. (2021), where an association between “antisocial potential” (individuals with characteristics such as low acceptance of moral rules and engagement in delinquency) and non-compliance to Covid-19-rules was found. Likewise, the research from O’Connell et al. (2021) showed the existence of an association between antisocial behavior and reduced social distancing during the pandemic.

Moreover, it seems of interest to investigate how the self-maximizing attitude of Machiavellianism will translate into the pandemic situation. It is reasonable to assume that it could occur through disregarding people’s safety and protection from contracting the Coronavirus by breaking the pandemic rules and keeping on living their lives with the same freedom as before. Nevertheless, it could also occur, that people with Machiavellian dispositional tendencies engage in preventive behavior to protect themselves due to their self-centered character. In the second case, following the rules would be a consequence of selfish interest to safeguard oneself rather than having in mind other individuals. This scenario should be likely when the individual is part of a Coronavirus risk group and consequently has a strong desire not to get infected by the virus. Therefore, it can be theorized that classifying as a risk group member could moderate the effect of Machiavellianism on rule-breaking by making the relationship weaker for individuals with Machiavellian dispositional tendencies who are part of a Covid risk

group and stronger for those who are not part of it. Therefore, this research will include being part of a risk group as a moderator.

When looking into theory, the life history theory seems to show support for a possible connection between Machiavellianism and Covid rule-breaking. According to this theory, individuals adopt a slow or a fast life strategy that explains certain behaviors and physiological characteristics. The Dark Triad personalities reflect the fast life strategy (Jonason & Tost, 2010) characterized by the tendency to pursue short-term relationships, instant gratification, rewards, and self-oriented acting. These behaviors become salient in stressful and uncertain environments. Some specific Machiavellian characteristics such as exploitativeness and antisocial behavior correlate with a fast life strategy (McDonald et al., 2012, Ellis, 1987; Tielbeek et al., 2018; Del Giudice & Belsky, 2011). Concurrently, altruism and adherence to social and moral rules (which are low in Machiavellianism) correlate with the slow life strategy (Rushton, 1985; Gladden et al., 2009). Although conflicting results, the research from Baughman (2016) found a positive relationship between Machiavellianism and the inability to delay gratification, which is a key element of the fast life strategy. This correlation is supported by the individuals scoring high on Machiavellianism being highly sensitive to rewards (Birkás et al., 2015). Moreover, the research from Chen (2018) found a direct relationship between Machiavellianism and fast life strategy and argues that Machiavellianism itself is a fast life strategy often adopted in environments characterized by uncertainty.

Consequently, it is possible to theorize that individuals scoring high on Machiavellianism, given that they adopt the fast life strategy, should be more likely to disregard the Covid measures than slow life strategizers. In fact, their inability to delay gratification and behaving to prioritize oneself should translate into consciously ignoring the possible enduring

consequences of their actions by disregarding the Covid measures and engaging in self-serving behavior (i.e., not limiting social interaction and contact). This tendency should be accentuated even more due to the unpredictability and psychologically distressing character of the Coronavirus situation (Petzold et al., 2020). Further support for this thesis is shown by the research from Corpuz et al. (2020), which identified adopting a slow life strategy as a predictor of endorsing preventive Covid behavior and, therefore, opposite results are expected for Machiavellianism. However, the calculating, strategic and long-term reasoning character of the Machiavellian personality trait, which rather represents a slow life strategy, could be a valid counterargument and result in an unexpected outcome.

The relevance of this study, as mentioned before, lies mainly in the fact that previous research (Nowak et al., 2020; Espinosa & Clemente, 2021) lacks focusing solely on Machiavellianism since they investigated the associations between non-compliance of Covid-19 measures and the Dark Triad. Consequently, a lack of attention and reasoning about the findings of this construct exists. Besides the study from Zakenkoski et al. (2020), Machiavellianism was assessed, in the existing literature, within the Dark Triad personality traits with a low amount of items within the questionnaires. This might not entirely reflect the multifaceted aspects of Machiavellianism, making it hard to capture how this construct correlates with antisocial behavior but simultaneously does not act impulsively but rather strategic and calculated. Thus, the possibility exists that when looking specifically at Machiavellianism alone, the effect might not be significant. Likewise, previous research did not include being part of a risk group, which might play an essential role in the investigated variables' relationship. Furthermore, these studies were conducted exclusively with Polish, Spanish and Italian participants. Hence, it would be beneficial to see if the results can be reproduced in different countries as well. Added to that, due

to the novelty of the Coronavirus, this topic is still lacking research necessitating further investigation. Along with that, this research can be of importance for practical policy implications. As already suggested in the research from Triberti et al. (2021), it could support the idea of whether it is reasonable for governments to frame the Covid regulations in a way that increases the motivation of individuals scoring high on Machiavellianism, making compliance for them more appealing. Since the investigated personality trait scores high on selfishness and cynicism, this could be achieved by emphasizing more the personal gains that can be obtained by adhering to the rules and the avoidance of personal risks, rather than motivating based on the altruistic character of compliance and the aim to protect others.

Thereupon, the hypothesis that scoring high on Machiavellianism will increase the likelihood of breaking pandemic-related measures will be investigated. Furthermore, it will be analyzed whether being part of a Covid risk group will moderate this relationship leading to the overall research question of whether Machiavellianism is a predictor of Covid-19 rule-breaking and whether being part of a risk group has a moderating effect.

Method

Participants

The sample of the study consisted initially of 919 participants (students from Tilburg University and the general community). After checking for outliers and missing data, 150 participant's data were deleted, leaving a total sample of 769 (71% female, 29% male). Participants's age ranged from 16-84 ($M = 32.4$, $SD = 16.52$). Most participants were Dutch (75%), and 25% were from different nationalities (e.g., Belgian, German, British). They were mainly residents in the Netherlands (85%), while the remaining 15% had a different place of

residence (e.g., Belgium, Germany, UK). Ninety percent of the participants were not part of a Covid risk group compared to the remaining 10% who were (around 3% were over 70 years old, 8% had an underlying condition). Most of the participants never had trouble with the law or only received a fine (97%) compared to the rest (3%; were arrested, were convicted with or without prison). The majority (72%) of the sample completed higher education/university.

Procedure

The participants were sampled through the method of snowball sampling and university recruitment. They were recruited online by students who, through social media and personal connections, forwarded a link containing an online questionnaire. University students could participate for course credit. The link (along with an informatory introduction about the study purpose) was posted in social media groups of all types, including those where the likelihood of an anti-Covid-sentiments was higher. Due to an international sample, Dutch and English versions of the questionnaires were used (the back-translation method was applied in case of translation unavailability).

Through the aforementioned link, the participants were directed to an information letter with instructions on how to contact the researcher in case of questions. It also informed about the voluntary character of the questionnaire, the possibility to interrupt or take breaks, the minimum age of sixteen to participate, the data's confidentiality, and the approval by the Ethics Review Board of Tilburg University RP397. In order to avoid a biased sample, participants did not receive an explanation about the exact content of the research. Afterwards, participants filled out the questionnaire and were debriefed at the end. Almost all questions required an answer, except for sensitive ones. The overall number of items was 304, with an estimation of the response time between 30 and 60 minutes. To avoid fatigue, participants were informed of the possibility to

take breaks in between answering, and the blocks of questionnaires were following a randomized order. For this specific research question, the data from two questionnaires and seven demographic variables were analyzed.

Materials and measurements

Machiavellianism

The continuous variable of Machiavellianism was measured through the 15 items Super-Short Form of the Five Factor Machiavellianism Inventory (FFMI-SSF; Du, Collison, Vize, Miller, & Lynam, 2021). It measured three factors ("antagonism," "agency," and "planfulness") using elements of the FFM personality questionnaire. The FFMI-SSF's items were rated on a 5-point Likert scale (1 = disagree strongly, 5 = agree strongly): five items measuring the factor antagonism (composed by subscales such as "selfishness" and "callousness") with statements like "Being honest all of the time will not lead to success", six items measuring the agency factor made out of subscales such as "assertiveness" and "self-confidence" (e.g., "I am very sure of myself"), and four items measuring the planfulness factor (including the subscale "deliberation" and "order") with statements such as "I prefer to be spontaneous rather than planning everything out."

The final score was obtained by averaging responses across items. A high score equaled a high level of Machiavellianism. The internal consistency for the antagonism subscale was poor ($\alpha = .58$), for the agency subscale was questionable ($\alpha = .69$) and for the planfulness subscale was acceptable ($\alpha = .72$). The overall Cronbach's alpha initially equaled .56 (poor). It improved by eliminating two items (from the antagonism subscale) resulting in a final internal consistency of .60 which is still questionable.

Covid rule-breaking

The continuous variable of Covid rule-breaking was measured by a variable (11 items) that was contingent on a prior question (i.e., the applicability of 11 Covid regulations in the participants' current place of residence). Only the items to which participants responded that they were "Obligated" or "Advised" were taken along in the measures. The items were rated on a 4-point Likert scale (1 = "I did not follow this rule/advice at all, even when I was able to," 4 = "I always followed this rule/advice to the best of my ability"). The final score was obtained by averaging responses across the items of adherence to the regulations that had been previously reversed. Therefore, a high score equaled a high level of breaking Covid-19 related rules. The internal consistency was questionable ($\alpha = .66$) and could not be improved by item deletion.

Covid risk group, age, gender

The categorical variable of the Covid-19 risk group was measured by the item "Are you part of a Covid-19 risk group?" with the answer options "No", "Yes, over 70 years old", and "Yes, because of an underlying condition (e.g., lung disease, diabetes, kidney disease, heart disease, lowered resistance, HIV)". In order to divide the sample into being part of a risk group and not being part of a risk group, the last two answer options were recoded by combining them into one. Moreover, it was controlled for the variables age (continuous), and gender (categorical) due to their correlation with Covid-rules compliance (Galasso et al., 2020; Nivette et al., 2021; Solomou & Constantinidou, 2020). For simplicity's sake, data from participants identifying with the answer "other" when questioned for their gender were not included in the data set.

Analysis

Preliminary analysis

Preliminary analyses checked for outliers through Casewise Diagnostics, Cook's, and Leverage's values. Then means, standard deviations, and range of age, Machiavellianism, and

Covid-19 rule-breaking were examined. Likewise, frequencies for gender, nationality, country of residence, education level, trouble with the law, and Covid risk groups were calculated.

Afterwards, correlations between Machiavellianism, Covid-19 rule-breaking, and age were calculated. Finally, a power analysis with the program G*power3 (Faul et al., 2007) was performed. The performed a priori power analysis ($f^2 = .02$, $\alpha = .05$, power = .8) resulted in a minimum required sample size of 647, which has been achieved in this study.

Main analysis

The main analysis investigated the hypothesis that a higher score on Machiavellianism results in a higher score of Covid-19 rule-breaking. This relationship will be weaker for individuals who score high on Machiavellianism and are part of a Covid risk group and stronger for those who are not part of it. This was done by running a between-subjects moderation analysis where the level of participants' Machiavellianism was the independent variable, while the extent to which they adhere to the Covid regulations was the dependent variable. As the moderator, being part of a risk group was used. The demographic variables of age and gender were being controlled for. Firstly, the assumptions for the moderation analysis were tested. The data of the dependent variable was not normally distributed, but due to the large sample size, this shouldn't have represented a statistical problem. The assumption of a linear relationship between the dependent variable and independent variable was fulfilled as well as the assumptions of multicollinearity and homoscedasticity. The moderation analysis was executed through IBM SPSS Statistics 24 with PROCESS v3.5 extension (Hayes, 2017) using Model 1.

Results

Descriptive and preliminary analysis

The sample's average score on Machiavellianism was 2.97 ($SD = 0.38$) with a range of 2.93. For Covid rule-breaking, the mean was 1.32 ($SD = 0.3$) with a range of 1.45. A small significant Kendall's tau-b correlation was found between age and Covid rule-breaking, ($\tau_b = -1.89, p < .001$). For age and Machiavellianism the correlation was not significant, ($\tau_b = .016, p = .534$). Also rule-breaking and Machiavellianism did not correlate significantly, ($\tau_b = .002, p = .941$).

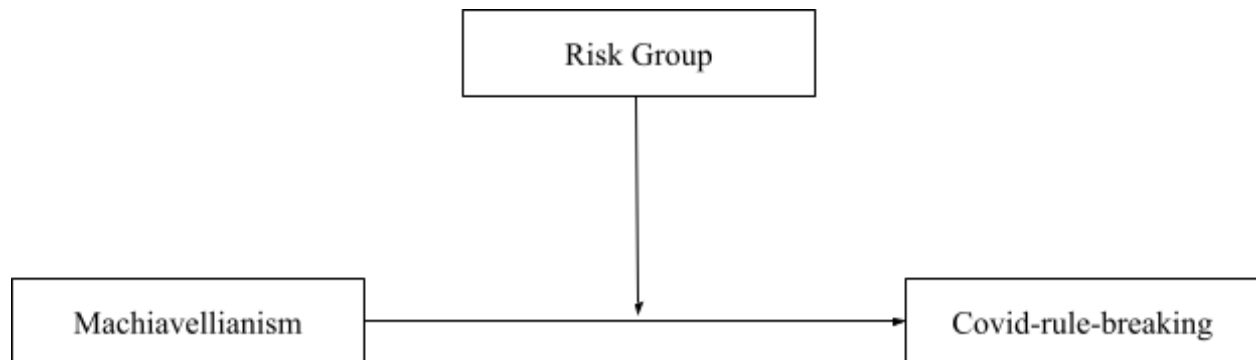
Main analysis

The moderation analysis that was executed is presented in Figure 1, and its regression coefficients can be found in Table 1. It showed that the overall model was significant with a small effect, $F(5,763) = 21.23, p < .001, R^2 = .12$. Machiavellianism had a non-significant main effect and therefore was not a significant predictor for rule-breaking. Furthermore, being part of a risk group did not significantly predict rule-breaking as well.

The interaction between Machiavellianism and risk group was not significant, showing that there was no moderating effect of the risk group and that the addition of the interaction of risk and Machiavellianism was not a significant change to the model, $F(1,763) = 0.59, p = .44, R^2 \text{ change} = .001$. Furthermore, the control variables age and gender had a significant effect on rule-breaking.

Figure 1

Visualization of the analyzed Moderation Analysis (Conceptual Statistical)

**Table 1**

Results of the analyzed Moderation Analysis

Variable	Unstandardized Coefficient	Standard Error	t	p	Upper confidence level	Lower confidence level
(Constant)	1.51	.31	4.84	< .001	0.9	2.12
Machiavellianism	0.06	.10	0.62	.54	- 0.14	0.26
Risk Group	0.25	.27	0.92	.35	- 0.38	0.77
Interaction (Machiavellianism and Risk Group)	- 0.07	.09	- 0.77	.44	- 0.24	0.11
Age	- 0.01	.001	- 8.4	< .001	- 0.01	- 0.001
Gender	- 0.14	.02	- 6.15	< .001	- 0.19	- 0.1

Discussion

Since the start of the pandemic, governments worldwide have tried to reduce the spread of the Coronavirus primarily by introducing preventive and containment measures. This research argued that Machiavellianism would act as a predictor for breaking Covid-19 related rules. Therefore, individuals who score higher on Machiavellianism would be more likely to not comply with the government-enforced measures. The life history theory backed up this assumption. Furthermore, due to the selfish nature of Machiavellianism, it was assumed that the relationship between Machiavellianism and Covid rule-breaking would be weaker for individuals with Machiavellian dispositional tendencies who are part of a Covid risk group and stronger for those who are not part of it.

The results of the conducted analysis did not meet the expectations. It showed that Machiavellianism was not a predictor of Covid rule-breaking and that being part of a risk group did not moderate this effect. It seems that the characteristics of the Machiavellian personality trait, such as selfishness, exploitative behavior, low empathy, etc., do not increase the disregard for the Coronavirus measures. A potential explanation of this could be the exceptional character of the pandemic situation, meaning that the abnormality of the circumstances could make the Machiavellian personality act differently than within a normal environment. In fact, it was expected that Machiavellianism would correlate positively with Covid rule-breaking since it is associated with general rule-breaking or characteristics that correlate with it. It is reasonable to assume that the lack of finding a significant relationship could be due to the abnormality of the pandemic situation. One relevant difference between general rule-breaking and the investigated one is the risk that is taken when violating the rules. Typically, committing an infringement does not expose oneself to a virus that can be health or even life-threatening, as do the Covid-rules.

Therefore, it can be argued that due to the fear of contracting the Coronavirus, the Machiavellian characteristics of using long-term reasoning, being strategic, and calculating might have acted as a buffer from disregarding the measures. Hence, it could be hypothesized that the relationship between Machiavellianism and Covid rule-breaking will be significant when a distinction is made between individuals scoring high on Machiavellianism on whether they have a high score on these specific traits. Accordingly, people with the Machiavellian personality traits, that score high on these characteristics, should break Covid rules significantly less, while those scoring low on them should be more likely not to comply. Likewise, this can explain why the results show that the life history theory cannot be applied to Machiavellianism in the scenario of the Covid-19 pandemic. In fact, the fast life strategy did not translate into gratifying behavior that goes against the regulations, and an accentuation of the adoption of the strategy could not be found. The reason could lay in the strategic aspect of the Machiavellian personality trait, which instead reflects a slow life strategy that correlates with adherence to Covid measures (Corpuz et al., 2020).

When comparing literature on the topic, it becomes clear that even though previous research found positive correlations between the Dark Triad (including Machiavellianism specifically) and Covid rule-breaking (Espinosa & Clemente, 2021; Nowak et al., 2020; Zajenkowski et al., 2020; Triberti et al., 2021), these results could not be replicated. This is explainable by the fact that the focus was mainly put on the Dark Triad as a whole, and the distinction between the three components was scarce. As a matter of fact, with the exception of the research from Zajenowski et al. (2020), Machiavellianism was assessed in previous literature by Dark Triad questionnaires (Dark Triad Dirty Dozen; Jonason & Webster, 2010 and Short Dark Triad; Jones & Paulhus, 2013) resulting in a low amount of items measuring the Machiavellian

personality trait exclusively. Consequently, it can be argued whether this was sufficient to capture all the aspects that reflect the Machiavellian nature and distinguish it enough from narcissism and psychopathy. A similar issue arises when it comes to the measures of the Covid-19 rule-compliance/breaking. This is because the measures of this variable in Nowak et al. (2020) and Zajenkowski et al. (2020)'s studies were assessed by three items in the first research and a single one in the second one compared to the 11-item scale in the present study. Furthermore, their population (Spanish, Polish, and Italian) might differ from the population under investigation in the current study, which was mainly resident in the Netherlands. This aspect might be relevant since, during the pandemic, each country adopted different measures and, more importantly, applied them with varying strictness influencing the extent to which they were followed. Lastly, previous literature did not control for age, and sex, which might have played a confounding role since they are associated with different extents to which individuals comply with the measures (Galasso et al., 2020; Nivette et al., 2021; Solomou & Constantinidou, 2020). Consequently, it can be concluded that overall, the differences in sample, assessment of the variables, and consideration of control variables could have led to discrepancies in the outcomes between the current study and already existing literature.

Considering the results of the present research, it can be claimed that the initial assumption that framing the Covid regulations to be more appealing to individuals with Machiavellian dispositional tendencies loses relevance. Therefore, it does not appear worth investigating changing the formulation of regulations explicitly targeted towards people scoring higher on Machiavellianism. Instead, it might be more relevant to focus further research on psychopathy and narcissism by addressing the personal gains obtained by following the rules rather than underlining the prosocial aspect of protecting others. The emphasis should be put on

how adherence will safeguard oneself and lead to a sooner return to normality and, therefore, improve one's personal life.

Although this study could not replicate the previous results, it still shined some light on the novel Coronavirus situation and to what extent rule-breaking committed by individuals with the Machiavellian personality occurs within the Coronavirus environment. However, there are still some limitations that need to be addressed. For instance, the generalizability of the findings is limited. Although one of the strengths of this study is the considerable sample size and its fulfillment of the power analysis requirements, it is not necessarily representative of the general population. Most of the participants were relatively young, female, highly educated, resident in the Netherlands, and with a Dutch nationality resulting in a fairly W. E. I.R.D. (Western, educated, industrialized, rich and democratic; Henrich et al., 2010) sample. Likewise, the unbalanced distribution of individuals being part of a risk group and not could have influenced the outcome by underestimating the moderating effect (Memon et al., 2019). A further limitation is that respondents might have adopted a position to make themselves appear more socially desirable since the variables were measured by self-report. This accounts especially for the Machiavellianism questionnaire since it is generally not a personality trait people voluntarily want to portray or identify with. The same affects the questions regarding the rule-breaking since admitting to breaking them equals showing disregard towards others' safety. However, it is important to remember that to counter this, the questionnaires were completely anonymous.

Moreover, in the present study, the measurement of Machiavellianism had an overall questionable Cronbach's alpha. The questionnaire is still relatively new and has not been used much, making its reliability doubtful. Furthermore, the rule-breaking questionnaire was created for this study and is not validated. Lastly, the snowball sampling technique, since it relied mainly

on volunteering, could be considered a limitation. It can be presumed that individuals with Machiavellian dispositional tendencies, due to their low prosociality, are less likely to volunteer their participation in a non-compensated study leading to a lack of variation. This discrepancy of participation might have been accentuated even more by the length of the study affecting fatigue and accuracy of the answers.

Future research should attempt to collect data from a more representative population, including more nationalities and an equal representation of gender and age. Furthermore, it would be of high relevance to include more participants who are part of the Covid risk group to effectively measure its moderating effect. Added to that, due to the hypothesis that individuals with Machiavellian disposition tendencies who score high on characteristics such as strategic and long-term reasoning are going to significantly score lower on Covid rule-breaking, it would be relevant to analyze in future research if this variable within Machiavellianism impacts the results.

Lastly, as previously mentioned, since for the Machiavellian population, the framing of the Covid-rules does not seem to be of interest, it appears more reasonable to focus on the other two Dark Triad constructs (psychopathy and narcissism). As shown by the research from Nowak et al. (2020), the Dark Triad had a stronger concern about the negative aspects of engaging in preventive behavior rather than its benefits. Consequently, compliance could be improved by putting more emphasis on the narcissistic sense of superiority and psychopathic selfishness. (Paulhus & Williams, 2022), by framing the regulations as beneficial for oneself, rather than trying to trigger empathy which the Dark Triad scores low on (Jonason et al., 2013, Porter et al., 2014).

In conclusion, this research gave some insight into the relationship between the variables of Machiavellianism and Covid rule-breaking. In fact, it seems that Machiavellian characteristics

that suggested an increase of disregard for the rules did not result in an above-average rule-breaking behavior in the Coronavirus situation. The results also imply that the Machiavellian fast life strategy is not being reflected by a violation of the rules, and this strategy is not accentuated by the unpredictable environment of the pandemic situation. Furthermore, it was shown that classifying as a risk group member does not make the relationship between Machiavellianism and Covid rule-breaking weaker. Also, the relationship is not stronger for those who are not part of a risk group. This suggests that the selfish character of Machiavellianism does not translate into adhering to the rules for their own protection and that rather the strategic and calculating mentality of individuals scoring high on Machiavellianism played a preventing role from pandemic rule infringement. Lastly, the lack of significant results makes investigating whether formulating the Covid regulations to increase compliance from Machiavellian individuals less relevant. However, it can be of interest to focus on the other two constructs of the Dark Triad: psychopathy and narcissism.

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