

**I Love You too Much to Keep Social Distance: Closeness in Relationships and
(Dis)Engagement in Preventive Behaviours During the COVID-19 Pandemic**

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Abstract

Although we are witnessing a new phase in the management of Covid-19, understanding what predicts adherence to preventive behaviours still remains crucial. In this study we focus on interpersonal relationships by specifically investigating whether engagement in preventive behaviours when in the presence of others may be a function of the type of relationship (in terms of closeness) one has with others. Because close others are often perceived similar to the self compared to strangers, we put forward that close relationships may inadvertently decrease Covid-19 risk perceptions which may ultimately decrease compliance with recommended behaviours when in their presence. To test this hypothesis, 747 Italian respondents were invited to answer one out of four versions of a questionnaire differing on the target (i.e., friends vs. parents vs. grandparents vs. strangers), including questions regarding Covid-19 risk perceptions and intentions to engage in preventive behaviours. Mediation analysis showed that close relationships (i.e., with friends, parents, and grandparents) compared to non-close relationships (i.e., with strangers) predicted lower intentions to engage in preventive behaviours via lower risk perceptions. Altogether, these results shed light on the role played by closeness in indirectly shaping individuals' dis(engagement) in preventive behaviours and contribute to better understand possible unconscious biases which may undermine our safety during the Covid-19 pandemic.

Keywords: Closeness, preventive behaviours, Covid-19

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In March 2020 Covid-19 was declared a global pandemic. The new corona virus has caused several severe physical health issues, deaths as well as extreme indirect effects on individuals such as depression, anxiety, or loneliness due to the strict measures implemented by governments to reduce the spread of the virus (Serafini et al., 2020). Many countries in Europe have now moved towards a new phase in the management of the pandemic. Yet, governments, just like before, advise individuals to follow preventive behaviours to fight the spread of the virus. Reaching individuals' adherence to these recommendations is of extreme importance in this phase. As a case in point, the key notion that Covid's behaviour is strongly dependent on individuals' behaviour has been frequently reported (e.g., Kluge, 2020) and should still be part of our daily reality.

Although research has extensively focused on individuating different predictors of adherence to preventive behaviours during the Covid-19 pandemic (e.g., Clark et al., 2020; Trifiletti et al., 2021; Visintin, 2021), very little attention has been devoted to understanding whether the type of relationship one has with other people - as for example in terms of closeness - may contribute to determine individuals' preventive behaviours when in their presence (but see Tu et al., 2021). The aim of the present research is precisely to understand to what extent engagement in preventive behaviours is a function of the type of relationship with others (close vs. non-close), and specifically whether closeness would decrease intentions to engage in preventive behaviours because of the lower perceived risk of Covid-19 infection associated with close others compared to unfamiliar, non-close others. To the extent that the pandemic has heavily hit on our relations with others (Rumas et al., 2021), understanding how our appraisal of different types of relations (in terms of perceived closeness) have contributed to shape our reaction to the pandemic can shed light on key pandemic-related behaviours.

To test this hypothesis, we conducted a study in which participants were asked to answer questions about one of four target groups which differed based on the level of closeness with the

participant (i.e., friends vs. parents vs. grandparents vs. strangers), rate the perception of Covid-19 infection risk associated with them as well as intentions to engage in Covid-19 preventive behaviours when in their presence.

Close others vs. non-close others, Covid-19 risk perception, and preventive behaviours

As far as risk perception is concerned, research shows that individuals likely underestimate the risk of getting infected (Salgado & Berntsen, 2021). This “unrealistic optimistic” has been shown to be present in many health domains, including the risk of contracting Covid-19. In this study, we investigate what we believe to be a key factor associated with reduced risk perceptions.

If on one side the pandemic has forced us to separate, on the other hand it may have brought people to feel closer than before. This may be especially true for those who we consider most valuable to us, such as family and friends. One could speculate that in times of Covid-19, compliance to recommended protective measures, at least when in the presence of familiar and close others (i.e., friends and family), may enhance as a way to protect close others from the risk of contracting the virus. Yet, we believe that close others may, instead, inadvertently activate mechanisms which could lead to perceive less risk associated with infection when in their presence. There are several reasons we believe this could be possible.

First, research shows that we feel different towards close (e.g., family, friends) rather than non-close individuals (e.g., strangers). In general, close others rather than unfamiliar others may be treated as the self in the sense that, to a certain degree, the others’ identities, resources as well as perspectives, are conceptualized as if they were our own (Aron et al., 1991, 1996, 2013) resulting in a self-other overlap. This pattern also extends to trait judgement, given that traits associated to the self automatically activate traits associated with close others often resulting in self-other confusion (Aron et al., 1991; Mashek et al., 2003). In line with this reasoning, studies relying on functional magnetic resonance imaging (fMRI) testify to a self-other blurring following threat activation concerning the self and close others, but not strangers. This is clear since the brain regions activated during threat-related stimuli involving the self in part overlap with the threat-related stimuli involving

close others (i.e., friends). Specifically, responses correlate as a function of the inclusion of the other in the self (Beckes et al., 2013). These results further clarify how the self and close others share more than expected, with close others representing an “extended self”. This likely leads close others to be perceived as less threatening and as posing less risk to the self, compared to strangers.

It comes with no surprise that closeness leads to trust familiar others - with whom we likely share more close relationships - more than unfamiliar others with whom no closeness is shared (Alarcon et al., 2016) as reported by research showing that people trust members of their in-group (i.e., individuals with whom one identifies with) more compared to out-group members (i.e., individuals with whom one does not identify with) which are likely perceived as more dishonest, less trustworthy, and less cooperative (Brewer, 1979). It may be that trust may then decrease individuals’ levels of perceived risk associated to that person/target.

Second, when dealing with close rather than non-close others our behaviour also changes. Specifically, avoidance is activated more intensely in response to unfamiliar compared to familiar individuals as a way to likely protect oneself from physical threat such as disease-carrying agents (e.g., Navarrete & Fessler, 2006). For example, we tend to avoid and hold higher levels of disgust, which is thought to serve a disease-avoidance function (Oaten et al., 2009), when processing material associated with strangers compared to that of familiar individuals (Peng et al., 2013).

Third, and in line with the above-mentioned studies, research has shown that individuals tend to greatly underestimate the risk associated to one’s own group’s behaviour (Campbell & Stewart, 1992) and that generally, sharing a social identity lowers health-risk perceptions (Hult Khazaie & Khan, 2020).

Altogether, the above-mentioned studies suggest how feeling close (vs. distant) to others likely leads individuals to feel and behave differently and activate specific cognitive mechanisms which lead individuals to underestimate health-related risks.

Focusing on the Covid-19 pandemic context, there is some evidence showing that individuals likely underestimate the Covid-19 risk of infection when considering close others compared to non-

close others (i.e., acquaintances). As a case in point, Salgado and Berntsen (2021) found that individuals rated the risk of getting infected as well as carrying the virus without symptoms as lower for the self, compared to acquaintances. This was also true when considering close others' likelihood of getting infected and carrying the virus compared to acquaintances. These results suggest that the low perception of risks for the self may be carried over to close others, which supports the idea of a self-other overlap (Salgado & Berntsen, 2021). Importantly, across different studies Schlager and Whillans (2022) found that American and Canadian individuals underestimated the likelihood of contracting the virus from close others compared to strangers. In addition, they showed how reduced perceived risk was linked to higher intentions to participate in a common social event with a friend compared to a stranger thus providing initial evidence that close others may reduce the likelihood of engaging in preventive behaviours via reduced risk perception.

Based on the above-mentioned studies, close relationships such as those with family and friends may be linked to lower levels of Covid-19 risk perception associated with them based on the fact that close others likely share knowledge structure, characteristics, perspectives, and also traits with the self (Aron et al., 1991; Mashek et al., 2003). Close others should thus be perceived as an “extended self”, more familiar and predictable compared to strangers. In addition, since familiar compared to unfamiliar others are usually thought to be less potentially infectious (Peng et al., 2013), close others should not represent a threat to the self and should be thus regarded as less likely involving risk of infection. This should in turn reduce the likelihood of engaging in different types of preventive behaviours. The rationale for the latter hypothesis is provided in the next section.

Different health models have considered risk perceptions to be important predictors of behaviour (Brewer et al., 2007). Risk perception has been often studied as a possible antecedent of preventive behaviour in times of emergencies. Indeed, several studies so far have found a positive association between risk perception and compliance with recommended behaviour during a pandemic (see Bish & Michie, 2010 for a review). In the case of Covid-19 pandemic, studies have

shown that higher perceived risk of infection predicts engagement in one or more protective behaviours (Siegrist et al., 2021; Trifiletti et al., 2021; Wise et al., 2020; Xie et al., 2020, Yıldırım et al., 2021). For example, de Bruin and Bennet (2020) found that perceived risk of infection was associated with compliance with health behaviours such as hand-washing. Similarly, findings from a study carried out by Yıldırım and colleagues (2021) show that those who perceived a high risk and who believed they were vulnerable were more likely to engage in preventive behaviours, suggesting that risk perception may indeed lead individuals to more strongly follow preventive behaviours in order to avoid infection.

The present research

The aim of the present research was to understand to what extent preventive behaviours during the Covid-19 pandemic may vary as a function of the type of relationship with others. We put forward that the type of relationship one has with others will be associated to perceived risk of Covid-19 infection, which in turn will impact on Covid-19 preventive behaviour intentions when in the presence of others. To test this hypothesis, we decided to take into consideration different types of relationships with either friends, parents, grandparents, or strangers. To test whether such relationships vary in their degree of closeness, we assessed inclusion of the target in the self, with the aim of distinguishing between close vs. distant others based on the levels of inclusion of the other in the self. We also collected data on perception of risk of contracting the virus and of passing the virus on to others as well as intentions of engaging in preventive behaviours such as distancing and wearing of a mask when in the presence of others. We then tested a model including the type of relationship as the predictor variable, perception of risk of Covid-19 infection as a mediator and intention to engage in preventive behaviour as our final measure.

Research has shown that close others (as well as the self) are thought to be less likely to get infected and to carry the virus (Salgado and Berntsen, 2021). In addition, research has shown that individuals who generally hold higher levels of trust towards others tend to perceive less risk associated with Covid-19 (Siegrist et al., 2021). Differently from this study, in the present research

we specifically investigate the extent to which different types of relationships (in terms of closeness) are associated with Covid-19 risk perception and, if this would, in turn, be associated with individuals' intention to engage in preventive behaviours. In other words, we do not focus on trust in general but on studying the potential impact of different types of relationship (close vs. non close) and how these may be indirectly linked to (dis)engagement in preventive behaviours when in the presence of others. This would ultimately allow to gain a better understanding of possible circumstances which should be regarded as a hidden risk in times of pandemics.

Method

Participants and procedure. Data were collected between the 31st of December 2020 and the 22nd of January 2021, during the 2nd wave of COVID-19 pandemic in Italy. During this specific period COVID-19 cases were raising, and the Italian government implemented strict rules (e.g., curfew between 10pm and 5am, strong limitations to movement between municipalities and regions, possibility to visit only another household per day) to contain the spread of the virus, especially during the Christmas holidays when Italian families usually meet and share meals between family members who might differ in their age and health status, with possible risks especially for older people and for people with health issues. Therefore, this particular period is characterized on the one hand by habits to spend time with family and friends but on the other hand by high saliency of risk perceptions of getting and passing the virus.

Participants were recruited through the social networks of research assistants of a University in Northern Italy, who were invited to recruit potential participants aged 18 or older. Before answering to the questionnaire, potential respondents were asked to agree to the informed consent to participate in the study and to the aggregated use of data.

Respondents to the questionnaire were 753. One respondent was excluded because they were under-age. Other 5 respondents were excluded because they answered to the questionnaire version with grandparents as target (see below) despite being over 65 years old (all the remaining respondents answering to the questionnaire targeting grandparents were maximum 40 years old).

Exclusion of such respondents does not impact the results. The final sample included 747 respondents aged between 18 and 89 ($M_{age} = 30.40$, $SD = 12.30$). Regarding self-reported gender, 449 participants were female, 297 were male, and one participant indicated other gender.

Questionnaires. Participants answered one out of four versions of the questionnaire, i.e. the target of IOS, risk perceptions, and preventive behavioural intentions varied across the four versions of the questionnaire, with participants answering either about strangers ($n = 199$), friends ($n = 202$), parents ($n = 154$), or grandparents ($n = 192$).

The three following measures differed across the four questionnaires versions as a function of the target.

Inclusion of the target other in the self (IOS). Respondents were provided with a pictorial single item (Aron et al., 1992) consisting in five graphical representations of two circles, with increasing overlap from the first pair of circles (two circles touching externally) to the fifth pair of circles (two circles with a big overlap). The circle on the left of each pair represented the self, while the circle on the right of each pair represented the target. Respondents were asked to choose the circle pair which represented their closeness with the target. Higher scores indicate higher IOS.

Risk perceptions. Respondents were asked to answer to four questions (adapted from Kashiwazaki, Takebayashi, & Murakami, 2020) assessing own and target risk of infection by COVID-19. Questions were: “What do you think is the likelihood that your health will be affected as a result of the current level of exposure to COVID-19?”, “What do you think is the likelihood of getting infected by [target]?”, “What do you think is the likelihood that [target] health will be affected as a result of the current level of exposure to COVID-19?”, and “What do you think is the likelihood that you infect [target]?”. Answers were provided on a five-point scale from 1 (*not at all likely*) to 5 (*very likely*). Reliability was acceptable (Cronbach’s alpha = .61), and a principal component analysis (PCA) suggested that all the items load onto a single factor (Eigenvalue = 1.86) explaining 47% of variance (factor loadings > .60). Therefore, answers were averaged to create a composite score with higher values indicating higher risk perception.

Preventive behavioural intentions. Participants were invited to think about their future behavioural intentions when meeting the target and to answer to four questions assessing their intentions to implement preventive behaviours in order to reduce the spread of coronavirus and avoid infecting and getting infected. Questions were: “Will you try not to meet them to avoid contagion risks?”, “When you will meet them, will you often and properly wash your hands to reduce the spread of the virus as much as possible?”, “When you will meet them, will you keep at least one metre distance at all time?”, and “When you will meet them, will you wear a face mask correctly during the whole meeting?”. Answers were provided on a five-point scale from 1 (*not at all*) to 5 (*very much*). The measure was reliable (Cronbach’s alpha = .87), and a PCA further suggested a mono-factorial structure of the measure (Eigenvalue = 2.86, 72% of explained variance by a single factor, factor loadings > .79).

The questionnaires included additional measures. Relevant for the current research, the questionnaires investigated the perceived health status of the participant (“How much do you perceive yourself as a healthy individual?”) and of the target (“How much do you perceive your [target] as healthy individuals?”) on a scale ranging from 1 (*not at all*) to 5 (*very much*). Respondents also reported the number of people they know who got COVID-19, on a scale ranging from 0 (*none*) to 5 (*more than 20*). Perceived own ($M = 4.12, SD = 0.73$) and target ($M = 3.30, SD = 0.79$) health status and number of known people who got COVID ($M = 1.91, SD = 1.29$ on the 6-point scale) were treated as control variables.

Results

First of all, we tested whether IOS varied as a function of the questionnaire version, i.e., if IOS differed for friends, parents, grandparents vs. strangers. We ran an ANCOVA with the target (friends, parents, grandparents vs. strangers) as between factor and IOS as the dependent variable. We controlled for age and gender (two dummy variables for male and other, with female as reference category). Results did not change when covariates were not controlled for. In line with expectations, IOS differed as a function of the target outgroup, $F(3, 740) = 47.86, p < .001$.

Specifically, IOS was higher for friends ($M = 3.84$, $SD = 1.10$), parents ($M = 3.66$, $SD = 1.13$), and grandparents ($M = 3.71$, $SD = 1.11$) compared to strangers ($M = 2.62$, $SD = 1.20$), $ps < .001$. No difference emerged between IOS of friends, parents, and grandparents, $ps > .087$. Therefore, the target was recoded into two different categories: close others (i.e., friends, parents, and grandparents, coded +1) and distant others (i.e., strangers, coded -1).

Next, we tested whether respondents had lower risk perceptions and intentions to implement preventive behaviours with close others compared to when encountering distant others. We run ANCOVAs with close vs. distant others as between factor, controlling for age, gender (as above, two dummy variables), perception of own and target health status, and number of known people who got COVID-19. Results did not change when covariates were not controlled for. As expected, respondents had lower intentions to implement preventive behaviours with close others ($M = 3.89$, $SD = 1.02$) compared to distant others ($M = 4.10$, $SD = 0.76$), $F(1, 739) = 4.26$, $p = .039$. Similarly, risk perceptions were lower for respondents answering the questionnaire with close others as target ($M = 3.01$, $SD = 0.70$) compared to respondents answering the questionnaire about distant others ($M = 3.22$, $SD = 0.71$), $F(1, 739) = 9.40$, $p = .002$.

To test whether risk perception mediated the effect of closeness on preventive behavioural intentions, we tested mediation using the Process macro (Hayes, 2017; Model 4). In the regression model, closeness (close others = +1; distant others = -1) was the predictor, risk perceptions were the mediator, and preventive behavioural intentions were the outcome variable. We included control variables which might affect behavioural intentions, i.e., age, gender (as above two dummy variables), perception of own and target health status, and number of known people who got COVID-19. The results pattern did not change if control variables were excluded from regression analysis. Results are reported in Figure 1. As hypothesised, closeness was associated with lower risk perceptions. Risk perceptions were in turn positively associated with preventive behavioural intentions. The indirect effect of closeness on preventive behavioural intentions via risk perceptions was significant, $B = -0.01$, $SE(\text{boot}) = 0.01$, 95% CI [-0.029, -0.002]. The total effect of closeness

on behavioural intentions was significant, $B = -0.08$, $SE(\text{boot}) = 0.04$, 95% CI [-0.162, -0.004].

When risk perceptions were included as predictors of preventive behavioural intentions, the direct effect of closeness on behavioural intentions was not significant ($B = -0.07$, $SE(\text{boot}) = 0.04$, 95% CI [-0.151, 0.007]), suggesting full mediation. Therefore, closeness reduced preventive behavioural intentions via reduced risk perceptions.

Discussion

Research has extensively focused on individuating different predictors of adherence to preventive behaviours during the Covid-19 pandemic (e.g., Clark et al., 2020; Trifiletti et al., 2021; Visintin, 2021). Among these, risk perception has been considered an important aspect by several researchers (Brewer et al., 2007 for a metaanalysis). Although individuals have generally shown growing awareness of the risks associated with Covid-19 since the beginning of the pandemic (Wise et al., 2020), individuals do not always objectively consider the risks of getting infected with Covid-19 and thus comply with preventive measures. We believe that one reason may rely on the type of relationship (in terms of closeness) one has with others such as family, friends, or strangers. The type of relationship may influence individuals' risk perception and preventive behaviours when in their presence.

The results of the present study show that inclusion of the other in the self was higher for family and friends compared to strangers with whom no relationship is shared, in line with previous studies (Aron & Fraley, 1999). This means that individuals perceive family and friends as close others compared to strangers. Second, the type of relationship was associated with perceived risk of contagion. Specifically, higher levels of closeness were linked to lower perceptions of risk of Covid-19 contamination. This result is in line with previous studies which highlight how individuals tend to underestimate the risk associated to close others (Schlager & Whillans, 2022) or their own group (Campbell & Stewart, 1992). At last, lower levels of perceived risk were linked to less intention to use preventive behaviours such as wearing a mask, social distancing and hand washing when in the presence of others. This result supports several studies which suggest that risk

perception is a predictor of engagement in preventive behaviour (Bish & Michie, 2010 for a review), as well as studies showing how avoidance is activated more intensely in response to unfamiliar compared to familiar individuals as a way to likely protect oneself from disease-carrying agents (e.g., Peng et al., 2013).

Yet, it should be noted that the link between risk perception and health behaviours has not always been found for every behaviour (Brewer et al., 2007; Trifiletti et al., 2021). One reason for this finding may rely on the type of behaviour considered, since research has shown that generally the association between risk perception and behaviour is stronger when individuals consider the behaviour easy to carry out (e.g., sunscreen use, Brewer et al., 2007) and should be also weaker when individuals perceive extreme costs (e.g., inconveniences) associated to the preventive behaviour or when there is a lack of knowledge on the correct behaviour to carry out (see Siegrist et al., 2021 for a discussion).

Altogether, these results suggest that closeness may act counterintuitively as it may inadvertently activate mechanisms which lead to less compliance with different recommended behaviours. This is in line with the so-called “paradox of trust” mentioned by Wong and Jensen (2020) who found that trust in authorities dampens individuals’ perception of risk with detrimental consequences in terms of belief in the need to comply with preventive behaviour. These results are also in line with an “unrealistic optimistic” interpretation which suggest that individuals generally hold optimistic views about their and close others’ (vs. acquaintances) risk of infection, which also testifies to the fact that close others are likely treated as the self (Salgado & Berntsen, 2021).

In sum, we believe our work to offer a further step in the understanding on the social underpinnings which fuel the spread of the virus. We now know that many carriers of Covid-19 infection are asymptomatic (Yu & Yang, 2020) which makes it very hard to detect the virus and thus prevent its spread. This is especially problematic when considering close others since we generally tend to spend more time with them compared to acquaintances or strangers, thus potentially increasing sources of infection. By identifying unconscious ways in which people

(unintentionally) continue spreading the virus is of vital importance for researchers and policy makers interested in the field.

Finally, these results have also practical implications. It is well established that one of the ways individuals may have to avoid the spread of the virus is social distancing as well as limiting situations of contact with others. Yet, as already mentioned, our results suggest that individuals perceive less risk of infection when in the presence of close others who may actually be sources as well as recipients of infection. By raising awareness on the cognitive biases which may arise when in the presence of close others, we believe individuals may more conscientiously think about their behaviour when in social circumstances and hopefully limit possibilities of infection (see Salgado & Berntsen, 2021 for a similar rationale; Schlager and Whillans 2022 for results in this respect).

Some limitations of this study should be acknowledged. First, we decided to create four different versions of the questionnaire to avoid participants having to answer to the same questions for each target. Not doing so would have made the questionnaire extremely long and repetitive likely leading to fatigue while filling in the questionnaire. In addition, by creating four different versions of the questionnaire we were able to create an experimental design where each target was made salient to participants which allowed them to totally focus on that specific target while they were answering the questionnaire and to compare the different conditions. Yet, this did not allow us to collect data on closeness towards all the target by each individual which is a limitation of our study. Second, we speculated that trust and disgust could play a role in the relation between closeness and risk perception. Yet, this was not measured in our study, so future studies should empirically test this assumption (see also Cruwys et al., 2020). Third, although we believe risk perception to be an important mediator in the relation between closeness and preventive behaviours, we think future studies should also consider additional mediators to achieve a wider picture of the possible reasons a decrease in preventive behaviours may occur when in the presence of close others. For example, individuals often rely on in-group norms to decide whether to engage or not in preventive behaviour (Neville et al., 2021). It is thus possible that compliance with a specific

behaviour may also be a function of closeness with an individual such that the closer one feels with one individual, the stronger the compliance with (non)preventive behaviour. Last but not least, although risk perceptions have usually been regarded as a predictor of preventive behaviours, with the current data we cannot establish causality between risk perception and preventive behaviour. It might, however, be possible that the fact of engaging in risky behaviour could subsequently reduce the perceived risk of certain behaviours in order to decrease the sense of fear or anxiety derived from the behaviour itself. Future studies should test this.

Altogether, this study provides an insight on the role played by closeness in indirectly shaping individuals' dis(engagement) in preventive behaviours. As also suggested by other studies (Salgado & Berntsen, 2021; Schlager and Whillans 2022), we believe that major attention should be devoted to clarifying the notion that individuals can often be driven by unconscious biases which negatively impact on their safety when in times of pandemics. Understanding the cognitive mechanisms involved in such circumstances is an important step in our fight against the virus.

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