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Using Self-Determination Theory to Link Empathy and Voluntary Health Behaviors

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Abstract

Health research demonstrates that prosocial health behaviors, while typically voluntarily, can be influenced by dispositional empathy. However, the motivating circumstances regarding this link between empathy and prosocial health behavior have not been well understood. Self-determination theory provides a framework for motivating voluntary behavior. Three preregistered studies (n_{total} = 630) sought to integrate self-determination's autonomous and controlled motivation to protect vulnerable populations from illness as potential mediators associated with dispositional empathy and face mask wearing behavior (Study 1 and 2), and flu vaccination (Study 3). Results demonstrate that autonomous motivation positively mediates the empathy-prosocial health behavior pathway whereas controlled motivation does not. Findings postulate the importance of identifying motivation in predicting face mask behavior and flu vaccination.

Keywords: prosocial health behavior, motivation, empathy, self-determination

Using Self-Determination Theory to Link Dispositional Empathy and Voluntary Health Behaviors

The COVID-19 pandemic sparked extensive literature on public health protocol compliance and motivation (MacIntyre & Wang, 2020; Pfattheicher et al., 2020). The World Health Organization (WHO) and the US Centers for Disease Control (CDC) have changed face mask recommendations throughout the COVID-19 pandemic. Face mask use might be important for mitigating COVID-19 spread (Rieger, 2020), and this behavior has become voluntary with lifted mandates. Local governments in Texas lifted mask mandates in March 2021 (Homer & Benito, 2021). On May 13, 2021, the CDC dropped guidance for face masks for those vaccinated (Wamsley, 2021).

Voluntary prosocial behaviors are also more likely to occur when people are motivated to do them (Rieger, 2020). Dispositional empathy is one motivational factor that facilitates prosocial health behaviors (Morstead et al., 2022). Another factor concerns others' motivation when such behaviors align with one's beliefs about protecting others from illness.

Motivating Prosocial Health Behavior Compliance: Empathy

Empathy has been proposed to be an important motivator of prosocial health behaviors, or behaviors performed to protect others from illness or harm (Böhm & Betsch, 2022; Favero & Pedersen, 2020; Hajek & König, 2022; Pfattheicher et al., 2020). However, definitions of empathy vary widely concerning whether empathy is context-specific (i.e., state-like) or dispositional (i.e., trait-like) (e.g., Cuff et al., 2016). Context-specific empathy is generally employed within interventions or manipulation tasks to foster one's ability to be empathic and perform a desirable behavior, such as mask-wearing following empathy prompts (de Ridder et al., 2021). Yet, using context-specific empathy to facilitate prosocial health behavior has produced mixed findings (de

Ridder et al., 2021). In contrast, dispositional empathy implies that one's empathy for others is a stable trait. That is, individuals have a larger 'capacity' or 'ability' to perspective-take (Eisenberg & Strayer, 1987), motivating prosocial behavior. For example, empathy was associated with prosocial behaviors across health and interpersonal domains (Cuff et al., 2016), including donating after natural disasters (Kim & Kou, 2014) or donating blood (Misje et al., 2005). Further, those with higher empathy may engage in these behaviors despite no direct benefits to themselves (Pavey et al., 2012) or without a personal relationship with the recipient (Prot et al., 2014).

In global health emergencies (e.g., the COVID-19 pandemic), solidarity for others is critical to protecting the community. Prosocial health behaviors intended to mitigate spread included wearing face masks in public spaces (Favero & Pedersen, 2020; Pfattheicher et al., 2020). COVID-19 vaccination was associated with more significant concern for others vulnerable to COVID-19, willingness to help others who suffer from COVID-19, and willingness to make personal sacrifices to prevent the spread of COVID-19 (Enea et al., 2023). High trait empathy also motivated handwashing behavior during COVID-19 (Morstead et al., 2022). The link between prosocial health behaviors and empathy is not isolated to the COVID-19 pandemic (e.g., Kousoulis et al., 2021). Empathy is also linked to increased H1N1 vaccination intention and handwashing to reduce infection spread (King et al., 2016) and with taking precautions during the Severe Acute Respiratory Syndrome and West Nile Virus (Puterrman et al., 2009).

Although state empathy is important in motivating face mask use (Favero & Pedersen, 2020; Pfattheicher et al., 2020), few studies have examined empathy as an individual difference. Further, the effects derived have largely been confined to laboratory experiments exploring empathy-inducing manipulations in specific social contexts. This leaves room for speculation on how and when empathy predicts face mask behavior. Indeed, using context-specific empathy manipulations to facilitate prosocial health behavior may not be effective beyond intention

changes, producing mixed findings (see de Ridder et al., 2021). Hajek and König (2022) suggested further inquiry into when and under what conditions dispositional empathy contributes to actual engagement in health behavior. Thus, the motivating components of the dispositional empathy-prosocial health behavior pathway warrants empirical attention.

Motivating Health Behavior Compliance: Autonomous Motivation

Individuals' motivation for engaging in voluntary behaviors is the domain of self-determination theory (SDT; Deci & Ryan, 2000; Ryan & Deci, 2017; Ryan, 2023). According to SDT, behaviors vary in the degree to which one's true self regulates them and are thus volitional and autonomous. Autonomously motivated behaviors are personally-endorsed values or interests. These behaviors are, therefore, engaged with a sense of importance and commitment. For example, wearing a face mask because protecting others is a personally-held value would be relatively more autonomous than doing so out of guilt or pressure or because others insist on it. These latter reasons reflect more extrinsically motivated behaviors. Behaviors can even lack intention when they are not motivated.

According to SDT, autonomous motivation leads to more prosocial behavior because it facilitates the internalization of positive social values and acting in accord with those personal values (Donald et al., 2021; Ryan & Deci, 2017). Adaptive social norms tend to be more prosocial than antisocial, which may be why the internalization that comes with autonomous motivation facilitates prosocial actions (Vansteenkiste & Ryan, 2013). A recent meta-analysis of 167 studies and over 1,000 effect sizes found that autonomous motivation was linked to more prosocial behaviors across various contexts (Donald et al., 2021). Ferguson et al. (2015) found that autonomous motivation led to stronger intentions to support charitable behaviors and, in turn, the likelihood of actual online engagement. Similarly, Hardy et al. (2014) examined adolescents' motivations for charitable donating, community volunteering, and abstaining from sex and

marijuana use, suggesting that autonomous motivation was a key factor differentiating the groups on levels of behavior. Autonomously motivated prosocial behaviors might also benefit both the helper and the recipient of the help (Weinstein & Ryan, 2010). Finally, Pavey et al. (2012), across three studies, found that autonomous motivation for helping mediated the relationship between state empathy and willingness to offer time and money to help a person in need (Study 1) and prosocial intentions and behavior (Study 2). Study 3 used another operationalization of empathy and found that autonomous motivation mediated the association between empathy and willingness to help.

Autonomous motivation can be operationalized at different levels, with the most general being individual differences (Ryan & Deci, 2017). Experiences of support can lead to dispositional tendencies to regulate one's behavior autonomously, attending to internal feelings or values, and behaving congruently. Alternatively, individuals' behavior can be regulated by guilt or internal pressures, others' expectations, or external contingencies. These individual differences in autonomous motivation reflect peoples' tendencies to orient toward the motivating aspects of situations in predictable ways (Ryan & Deci, 2017). Autonomous motivation can be operationalized at the least general level for specific situations or behaviors. In this way, autonomous motivation for wearing a face mask could be assessed relative to controlled motivation or lack of intention. This set of studies sought to better understand how empathy and autonomous motivation predict the prosocial health behaviors of voluntary face mask use and flu vaccination.

Current Studies

Three studies examined self-determined motivation, empathy, prosocial attitudes, and the prosocial behaviors of face mask use and getting a flu vaccination. Previous research demonstrated that prosocial behaviors, when autonomously motivated, tended to be more consistent than when

they are controlled (Donald et al., 2021) because one is more open to other's perspectives and experiences (Hodgins & Knee, 2002; Ryan & Deci, 2017). Self determination theory is a growing literature concerning the COVID-19 pandemic and motivating community-based health behavior (Martela et al., 2021; Morbée et al., 2021). Indeed, previous research establishes that autonomous motivation to adhere to infection-minimizing behaviors was associated with adherence (Morbée et al., 2021; Schmitz et al., 2021), including handwashing, social distancing, avoiding contact with others (Morbée et al., 2021) and registration for the COVID-19 vaccination (Schmitz et al., 2021). Autonomous motivation to adhere to COVID-19 guidelines was also associated with continued health behaviors soon after governments relaxed guidelines (Morbée et al., 2021), which was also associated with lower hospitalization and infection rates (Waterschoot et al., 2024). Other motivations (e.g., distrust, perceived risk) were not associated with behavior (Schmitz et al., 2021). Overall, these studies underscore the need for evaluating autonomous motivation in understanding prosocial health behavior (Martela et al., 2021; Waterschoot et al., 2024). Empathy might further explain how autonomous motivation is facilitated within these contexts. The first study explored empathy and trait autonomous motivation in relation to face mask attitudes and face mask use during the COVID pandemic utilizing the Generalized Causality Orientations (GCOS; Weinstein et al., 2010). Study 2 examined empathy in relation to more proximal autonomous and controlled motivation for mask use. Study 3 examined the generalizability of findings for flu vaccination status during flu season.

Study 1 Method

Participants and Sample Size

Participants (n =264, M_{age} = 23.28, *SD* = 4.39) were recruited from university samples from March – November 2021, immediately after Texas lifted all mask regulations. Most (78.52%) identified as female (21.09% male; 3.03% prefer not to say; .39% other). The sample was

ethnically and racially diverse, with 33.46% identifying as Hispanic or Latino, 31.13% Asian, 26.46% White, 12.06% Black or African American, 6.40% Middle Eastern or North African, 1.95% American Indian or Alaska Native, and 0.78% Native Hawaiian or Pacific Islander (n = 6 "other" or "prefer not to say").

A priori power analyses indicated that approximately 200 respondents would adequately reach 80% statistical power given an effect size of *d*=.2. All data-collection plans are at https://doi.org/10.17605/OSF.IO/9SXU2. The university's Institutional Review Board approved all methods and procedures for Study 1.

Measures

Empathy. Empathy was measured using the 16-item Interpersonal Reactivity Index-Brief Version (Ingoglia et al. 2016). Items include "When I see someone being taken advantage of, I feel kind of protective toward them," scored on a 5-point Likert-type scale ranging from 1 "does not describe me at all" to 5 "describes me very well" (α = 0.87).

Index of Autonomous Functioning. The 15-item Index of Autonomous Functioning (IAF; Weinstein et al., 2012) examined autonomous motivation as an individual difference. Items were rated on a Likert-type scale with 1="not at all true," 2="a bit true," 3="somewhat true," 4=''mostly true," and 5= "completely true." Items were averaged after reverse-scoring relevant items with higher scores reflecting more autonomous functioning (Weinstein et al., 2012) (α = 0.78).

Mask Attitudes. The 32-item Multidimensional Facemask Perception Scale (FMPS; Howard, 2020) examined one's attitudes towards face masks. Participants answered the prompt, "When I do *not* wear a face mask in public, it is because…," on a scale ranging from 1- "Strongly Disagree" to 5-"Strongly Agree." The FMPS has been used in several domains related to public

health (Ahmadi et al., 2022) and medicine (Resnicow et al., 2021). The FMPS was scored so that higher averaged composite scores reflected less negative face mask attitudes (α = .93).

Frequency of Mask Use. Participants reported how often they had worn a face mask within the past week, past three weeks, and past six months ranging from 1-"Never" to 7-"Every time." Items were averaged into a composite score (α = .94).

Prosocial Tendencies. Prosocial Tendencies were measured with the 25-item scale Prosocial Tendencies Measure (Carlo et al., 2003). The scale is scored along a 5-point Likert-type scale with 1="Does not describe me at all," 2="Describes me a little," 3="Somewhat describes me," 4="Describes me well," and 5="Describes me greatly." Items include "I tend to help people who are hurt badly," and "I usually help others when they are very upset." Items were averaged to form a composite measure (α = .88).

Study 1 Results and Discussion

Associations between empathy, autonomous motivation, general prosocial behaviors, and measures of face mask attitudes and face mask use were examined. Table 1 provides zero-order correlations, means, and standard deviations for composite scale scores. First, empathy and autonomous functioning were positively correlated, similar to research that used a different empathy measure (Weinstein et al., 2012). Empathy was also correlated with less negative attitudes toward face masks, greater endorsement of general prosocial behaviors, and greater frequency of mask use. Autonomous functioning was associated with less negative attitudes toward face masks and greater endorsement of general prosocial behaviors. Autonomous functioning was not associated with the frequency of mask use. In fact, endorsement of general prosocial behaviors was also not significantly associated with the frequency of mask use, suggesting that wearing a face mask during a pandemic may be unique compared to general prosocial behaviors. These results also suggest that trait autonomous motivation may be too distal

to predict the specific behavior of wearing a face mask. Autonomously motivated individuals would be expected to behave according to deeply held prosocial values. While these people were somewhat more likely to endorse general prosocial behaviors, this did not carry over to wearing a facemask. Possibly, less autonomously motivated individuals are more susceptible to immediate expectations and pressures during the pandemic. Such pressures went in both directions – with norms to wear facemasks nearly as plentiful as norms to resist or question doing so. If so, a clear positive association between trait autonomous motivation and face mask use might not emerge.

To better determine the roles of empathy and autonomous motivation in predicting face mask use, we examined a more proximal assessment of autonomous motivation – specifically, individuals' autonomous and controlled motivation for wearing a face mask during the pandemic.

Study 2

Autonomous motivation can be assessed at different levels of generality (Ryan & Deci, 2017). Behaviors in a specific domain tend to be better predicted by motivation assessed at a more specific level (Vallerand et al., 1991). Although Study 1 findings suggested that dispositional autonomous motivation may be too general to predict a specific prosocial behavior (i.e., wearing a mask during a pandemic), trait autonomous motivation has been shown to be mediated by autonomous motivation specific to that domain. For example, Knee et al. (2005) found that trait autonomous motivation predicted greater autonomous motivation toward one's romantic relationship, which in turn predicted less decline in satisfaction after disagreements. Thus, with regard to prosocial behavior, one's motivation toward mask use may be a more proximal predictor.

Within SDT, motivation for human behavior varies along a continuum from non-self-determined to extrinsically motivated and controlled to self-determined and autonomously motivated, depending on the reasons for engaging in the behavior (Ryan & Deci, 2017). The least self-determined behavior lacks intention and reflects when individuals do not know why they

engage in the behavior or are not interested in doing so. Wearing a mask without knowing why, or simply not doing so, would be non-self-determined. In contrast, controlled motivation includes behaviors done for instrumental reasons or because of pressures and expectations of oneself or others (e.g., Wearing a mask because it is socially expected or rewarded). Lastly, wearing a mask because one identifies because it reflects one's prosocial values and interests would be more self-determined and, thus, more autonomously motivated. Research has demonstrated that greater autonomous motivation is central to adherence and ongoing execution of desired behaviors, especially under voluntary conditions (Ryan & Deci, 2017). Autonomous motivation is, therefore, directly relevant to investigating face mask use due to the voluntary contexts in which one navigates.

Additional support for associations between autonomous motivation and voluntary behavior emerged in Pavey et al.'s (2012) study, which found that trait autonomous motivation mediated the relationship between empathy and voluntary helpful behavior, whereas controlled motivation did not. Accordingly, in Study 2 we assessed autonomous and controlled motivation toward mask-wearing. Specifically, we explored the potential mediating role of these motivations in the association between empathy and face mask use.

Study 2 Method

One hundred twenty-seven respondents (83.46% female, 13.39% male, 3.15% other or prefer not to identify) were recruited through university undergraduate pools between March and April 2022. Participants in Study 1 were not eligible for Study 2. Initially, 152 participants were recruited, however, respondents who failed to correctly answer two of three attention check questions (n = 12) were dropped from subsequent analyses to maximize data quality. The sample was also diverse: 39.37% identified as Hispanic, 31.50% Asian American, 12.60% White or European American, 9.45% Black or African American, 3.94% Middle Eastern or North African,

.79% Native Hawaiian or other Pacific Islander and the rest as some other race or ethnicity (2.36%). Ages ranged between 18 and 57 years old (M_{age} = 20.85, *SD* = 3.99).

All methods and procedures for Study 2 were approved by the university's Institutional Review Board prior to data collection and were uploaded prior to data collection: https://doi.org/10.17605/OSF.IO/MD4GP.

Measures

Motivations for Mask Use Adapted Scale. The Motivation Toward the Environment Scale (Pelletier et al., 1998) was adapted to measure autonomous and controlled motivations for mask use. The stem was refocused to "Why do you wear a face mask in public?" followed by 12 items reflecting controlled (e.g., "Because my friends insist that I do,") and 12 items reflecting autonomous motivation (e.g., "Because protecting others has become a fundamental part of who I am."). Items reflecting a lack of intention, such as "I feel that doing something about the COVID-19 pandemic is a waste of time," were also included. Responses were measured on a 7-point scale ranging from 1="does not correspond at all" to 7="corresponds exactly."

Other Measures. Empathy, frequency of face mask use, and mask attitudes were measured as in Study 1, yielding Cronbach alphas of .87, .94, and .94, respectively.

Study 2 Results and Discussion

Factor Analysis of Motivations for Mask Use

The PROC FACTOR routine in SAS specified promax (oblique) rotation, with priors set to squared multiple correlations, yielding an exploratory factor analysis. A scree plot of the eigenvalues, as well as Kaiser's criterion, suggested a two-factor solution. Table 2 provides items and factor loadings. The first factor yielded an eigenvalue of 4.79, accounting for 70% of the variance, and captured 7 of the original 12 items, reflecting more autonomous/identified reasons to wear a face mask, with factor loadings ranging from .61 to .89. The second factor yielded an

eigenvalue of 1.66 accounting for an additional 24%, capturing 4 items, reflecting more controlled motivation or lacking intention to wear a face mask, with loadings ranging from .51 to .67. Item 1 loaded .38 and .33 on factors 1 and 2, respectively, and was dropped from further analysis. Both factors were moderately negatively correlated (r = -.27). Mean scores were computed for autonomous (α = .92) and controlled motivation (α = .67), with higher scores reflecting more of each.

Table 3 presents correlations, means, and standard deviations for all study variables. Autonomous motivation was positively associated with frequency of face mask use, positive mask attitudes, trait autonomous functioning, and trait prosocial behavior. Those more autonomously motivated to protect others had more favorable attitudes toward face masks and reported wearing them more frequently. Face mask use was correlated with more general prosocial behaviors as well. In contrast, controlled motivation was associated with more negative mask attitudes and a lower frequency of face mask use. This correlation indicates that those motivated by social expectations, guilt, or a lack of intention had less favorable attitudes and reported wearing face masks less frequently. Interestingly, controlled motivation was also positively associated with general prosocial behaviors. However, this correlation makes sense if such behaviors are performed because of others' expectations or pressures, such as donating to charity out of guilt or volunteering to appear more generous. Therefore, when extrinsically motivated people are incentivized through rewards (i.e., positive appraisal) for being prosocial or are at risk of punishment (i.e., shame) if they are not, they may be more likely to behave accordingly. Finally, controlled motivation was not significantly associated with empathy or general autonomous functioning.

Mediation Analysis

We also explored the mediational roles of autonomous and controlled prosocial motivation in the association between empathy and face mask use frequency. Pavey and colleagues (2012) found that only autonomous motivation (but not controlled motivation) mediated the association between dispositional empathy and helping behavior. Additionally, face-mask wearing behavior operates similarly to other prosocial behaviors during COVID-19 (Pfattheicher et al., 2020). We therefore tested autonomous motivation and controlled motivation as mediators of the empathy–face mask use association using the PROCESS macro v3.5.3 for SAS (Hayes, 2017).

Autonomous Motivation. A positive association emerged between empathy and autonomous motivation (b = .731, SE = .191, $p < .001$, 95% CI [.354, 1.109]). There was also a positive association between autonomous motivation and frequency of face mask use (b = .542, SE = .101, $p < .001$, 95% CI [.341, .742]). The test of mediation with bootstrapped confidence intervals revealed a significant indirect effect of empathy on frequency of face mask use through autonomous motivation (b = .396, SE = .192, p = .0021, 95% CI [0.092, .827]). The direct association between empathy and frequency of face mask use was not significant after controlling for the mediator (b = .201, SE = .229, p = .381, 95% CI [-.251, .653]).

Controlled Motivation. As mentioned above and shown in Table 3, empathy was not significantly correlated with extrinsic motivation. Further, in testing the potential model, and consistent with Pavey et al. (2012), controlled motivation was not a significant mediator of the association between empathy and frequency of face mask use; b = -.027, SE = .057, p = .634, 95% CI [0.152, .099].

These results linked empathy with greater autonomous motivation to wear a face mask during the COVID-19 pandemic, which was then associated with greater face mask use. This association is consistent with previous research on other general voluntary and helpful behaviors (Pavey et al., 2012), and establishes prosocial behavior research as a function of dispositional

empathy and autonomous motivation. Concerning controlled motivation for wearing a mask, although it did predict more negative attitudes and less frequent mask use, this was not a function of empathy (or lack thereof), as demonstrated by nonsignificant mediation. Based on SDT, controlled motivation people are less likely to engage in prosocial behaviors across a breadth of domains than when autonomously motivated (e.g., Donald et al., 2021). SDT suggests that controlled behaviors are less internalized and are incongruent with one's social values (Ryan & Deci, 2017; Vansteenkiste & Ryan, 2013). The correlation between controlled motivation and less face mask use may indicate the relatively dynamic social norms associated with voluntary face mask behavior (Neville et al., 2021). In such situations, one might expect autonomous motivation to be fundamental in regulating consistent behavior.

However, Studies 1 and 2 investigated only one form of prosocial health behavior. Further, the proximal environment fluctuated with emerging information, vaccination, and social trends regarding COVID-19 infection spread and risk (Neville et al., 2021). To examine whether the empathy—motivation association extends to another prosocial health behavior, we explored empathy, motivation, and flu vaccination in Study 3.

Study 3: Extension to Flu Vaccination

Studies have demonstrated that vaccinations are generally effective in reducing and preventing infectious diseases and death, saving an estimated 4-5 million lives per year (World Health Organization, 2019). Vaccination also provides a secondary protective benefits to one's community, including protection for those too young to vaccinate, immunocompromised individuals, or those otherwise susceptible to infection for other reasons beyond the COVID-19 pandemic (e.g., Böhm & Betsch, 2022). Additionally, as with other voluntary prosocial behaviors, one's motivation for a flu vaccination can be autonomous or controlled to varying degrees. An individual may get vaccinated to satisfy others' expectations or avoid a sense of shame or guilt,

representing controlled motivation. An individual can also get vaccinated to act in accord with deeply held prosocial values, representing more self-determination and autonomous motivation. Böhm and Betsch (2022) found that dispositional concern for others – which they termed other-regarding – was linked to flu vaccination status. To explore this potential link, Study 3 examined empathy and motivations for flu vaccination. Participants were asked if they received flu vaccination between September 2021 and April 2022, when flu infection and spread tends to be highest (CDC, 2022).

Three preregistered hypotheses tested the mediational role of autonomous motivation for flu vaccination in the relationship between empathy and flu vaccination status: *Hypothesis 1*: Empathy would be positively associated with whether or not one receives a flu vaccination. *Hypothesis 2*: Empathy would be positively associated with autonomous motivation to receive a flu vaccination. *Hypothesis 3*: The association between empathy and the likelihood of flu vaccination would be mediated by autonomous motivation such that higher empathy would be associated with greater autonomous motivation, which in turn would be associated with a greater likelihood of receiving the flu vaccination. Correlations between motivation and flu vaccination attitudes – another supported association within vaccination literature (Martin & Petrie, 2017) were also explored.

Study 3 Method

Participants. Participant responses (n = 239) were collected online via university sampling participation pools, were 18 years of age or older, and did not participate in associated studies. Respondent ages (M_{age} = 20.93, *SD* = 3.81) ranged between 18 and 53 years old. Most identified as female (78.48%), 20.68% male, and .84% (n = 2) other. Race and ethnicity was diverse: 31.79% Asian, 28.87% Hispanic, 28.87% White, 12.97% Black or African American, 5.4% Middle Eastern or North African, .08% Native American or Alaskan Native, some other race

or ethnicity (n = 1) and preferred not to answer (n = 2). Initially, 283 participants were recruited, but 44 were discarded for failing attention check questions.

The university's Institutional Review Board approved all methods prior to data collection. Data and preregistration are available at https://archive.org/details/osf-registrations-gz2rn-v1.

Measures

Trait Empathy. Empathy was measured as in Studies 1 and 2 (α = .85).

Motivation to Receive the Flu Vaccination. As in Study 2**,** items from the MTES (Pelletier, 1998) were adapted regarding flu vaccination during the previous flu season (September – March; CDC, 2022). Participants were prompted, "Whether or not you received the annual flu vaccination during the last flu season (September 1, 2021 – April 1, 2022), to what extent did you endorse the following reasons for getting/not getting vaccinated against the flu?" with two scores representing autonomous (α = .92), and controlled motivation (α = .74).

Flu Vaccination Status. Participants were asked, "A flu vaccination can be a shot injected in the arm or a mist sprayed in the nose by a doctor, nurse, pharmacist or other health professional. Have you received the flu vaccination last year (between September 1, 2021, and April 1, 2022)?"

Vaccine Attitudes. The Vaccine Attitude Examinations scale (VAX; Martin & Petrie, 2017) was adapted to examine participant attitudes toward receiving a flu vaccination. Scores ranged from 1 “strongly disagree” to 7 “strongly agree.” The VAX was reverse-scored so that higher scores reflected more positive vaccination attitudes (α = .88).

Study 3 Results and Discussion

Correlation analyses indicated empathy was significantly correlated with autonomous motivation to engage in prosocial vaccination behavior ($r = .47$, $p < .001$) but not with controlled motivation to engage in prosocial vaccination behavior. These associations are consistent with

those observed in Study 2 and extend the utility of the motivation to engage in prosocial behavior to an additional prosocial health behavior: flu vaccination status. Autonomous and controlled motivations to engage in prosocial vaccination behavior were not significantly correlated. Positive vaccination attitudes were negatively correlated with controlled motivation to engage in prosocial vaccination motivation (r = -.41, p < .001) but not autonomous motivation or dispositional empathy.

The primary analysis involved standard linear structural equation modeling (SEM) logarithms in STATA v17 (StataCorp, 2021) with maximum likelihood estimation. Whether or not one had received the flu vaccination was coded with 0 = no flu vaccination and 1 = flu vaccination received. Most participants (67.09%) reported flu vaccination September 2021 – April 2022.

We consulted Geldhof and colleagues' (2018) guide to extrapolating conditional indirect effects to mediation models to interpret results.[1] In models with a continuous *X* and *M* and a binary *Y*, the partial derivative is equivalent to the direct effect between *X* and *Y* (controlling for *M*) and the conditional indirect effect is interpreted as the regressed slope for the *X*-*Y* pathway multiplied by the *partial derivative* (for review, see Geldhof et al., 2018).

Autonomous Motivation. Table 4 summarizes the estimated models, including the study variables' partial derivative direct, indirect, and total effects. As hypothesized, bootstrapped tests of indirect effects with 10,000 replications indicated that autonomous motivation significantly mediated the empathy – vaccination status association; b = .164, *BSE* = .029, 95% CI [.111, .222].

Controlled Motivation. For comparison, controlled motivation was also explored as a mediator but the conditional indirect effect was not statistically significant; b = .079, *BSE* = .052, z

[1] We thank Dr. Clayton Neighbors at the University of Houston for assistance with the statistical analyses.

= .81, 95% CI [-.027, .179]. This mimics patterns from Study 2 and other examinations (Pavey et al., 2012). Direct effects are summarized in Figure 1.

These preregistered mediation results are consistent with the exploratory mediation analyses in Study 2. Autonomous motivation was a significant mediator between empathy and the likelihood to vaccinate, whereas controlled motivation was not. These results suggest that one potential reason why empathy predicts more prosocial health behaviors is because of its association with greater autonomous motivation. Lastly, motivations for face mask use and vaccination operate similarly, and the adapted scale generalizes beyond COVID-19 face mask behavior.

General Discussion

These studies integrated research on dispositional empathy and self-determined motivation to better understand their roles in facilitating prosocial health behaviors (Böhm & Betsch, 2022; Donald et al., 2021; Favero & Pedersen, 2020; Ryan & Deci, 2017). Both face mask use and vaccination against infectious illnesses are prosocial behaviors that protect the community by mitigating infection spread to others. Empathy has been shown to motivate prosocial health behavior in health domains across contexts (e.g., Morstead et al., 2022). Yet, how and when empathy motivates prosocial health behavior has not been well understood. Together, these results suggest that individuals vary in autonomous and controlled motivation to engage in prosocial health behaviors and, in turn, self-reported behavior. Specifically, we examined face mask wearing during COVID-19 and flu vaccination during flu season. First, these studies explored the roles that dispositional empathy and autonomous motivation play in face mask behavior during COVID-19. Study 1 provided preliminary insight into associations between empathy, general autonomous functioning, and face mask use. General autonomous functioning, measured as an individual

difference, was associated with greater empathy and more positive attitudes toward face masks during the pandemic. However, general autonomous functioning was not correlated with the reported frequency of mask use. We speculated that this nonsignificant correlation might be because autonomous motivation was not examined specifically regarding face mask behavior.

Accordingly, we adapted a scale to directly examine one's autonomous and controlled motivation to wear a face mask (Study 2) and to vaccinate against the flu (Study 3). Both studies' mediation models yielded consistent evidence that autonomous motivation significantly mediates the association between trait empathy and prosocial health behavior. That is, greater trait empathy was positively associated with autonomous motivation to engage in prosocial health behavior. In turn, this predicted greater likelihood of face mask use or flu vaccination status.

Together, such findings demonstrate the significance of autonomous motivation when examining the conditions in which health behavior is likely. These results suggest that autonomous motivation can be examined beyond COVID-19 pandemic protocols. Mediation model tests revealed that autonomous motivation to vaccinate against the flu mediated the dispositional empathy—vaccination relationship. However, this relationship was nonsignificant when controlled motivation was entered as a mediator, perhaps reflecting the social norms present. Indeed, a literature review of vaccination intention and behavior revealed many vaccination hesitancy risk factors, including lack of confidence, complacency, disbelief, and inconvenience across sociodemographic factors (Schmid et al., 2017). Also, flu vaccination is voluntary but is nonetheless recommended to mitigate flu spread (World Health Organization, 2023). These findings further support the link between dispositional empathy and health behavior through motivation. Extensive research links autonomous motivation with prosocial behavior in domains within and outside health (Donald et al., 2021; Hardy et al., 2014; Pavey et al., 2012; Vansteenkiste et al., 2014).

It is also important to note that general autonomous motivation does not always predict a specific behavior, as was observed in Study 1. Similarly, while dispositional empathy might be an antecedent of autonomous motivation to help others, empathy is not always associated with actual prosocial behavior (Galang et al., 2021). According to SDT, motivation follows a hierarchical model (Ryan & Deci, 2017; Vallerand et al., 1991) such that motivation at more general levels (i.e., individual differences) predicts motivation at more specific levels (i.e., within a domain), which in turn predicts even more specific behaviors (e.g., wearing masks and getting vaccinated). As is recognized in attitude-behavior models, the better predictor of actual behavior tends to be more proximal intentions to engage in that behavior, as well as more specific attitudes regarding the behavior as in the theory of planned behavior (Ajzen et al., 2018). SDT's emphasis on autonomous motivation overlaps with attitude-behavior models, and efforts have been made to integrate them. For example, Hagger and Chatzisarantis (2008) found in a meta-analysis of 43 studies that self-determined motivation predicted intentions to engage in health behavior, and attitudes mediated intentions-engagement associations. Although these studies were limited to dispositional empathy, autonomous motivation, and attitudes toward face mask use and vaccination, the results lend empirical support to integrating SDT with the prosocial health behavior literature.

Limitations and Future Directions

First, these studies investigated correlates of health behavior and motivation cross-sectionally and do not assume temporal precedence of the variables examined. Individual differences may predispose an individual's motivated engagement in prosocial health contexts (e.g., Morbée et al., 2021). Dispositional empathy, however, like other individual differences such as COVID-19 anxiety or infection risk, is relatively stable and unlikely to change considerably with context (Cuff et al., 2016). In this way, one's dispositional empathy may be an underlying

mechanism by which autonomous motivation may be fostered. Because dispositional empathy may be prevalent as an individual difference, trait-like empathy can operate in conjunction with interventions to further foster prosocial health behavior beyond the laboratory and within more naturalistic settings, such as during flu season or following global health emergencies. The results presented can further aid in these intervention designs by offering a potential reason for the varied success when experimentally manipulating autonomous motivation via health behavior promotions within SDT (e.g., Legate et al., 2022). For example, Legate and colleagues' (2022) experimental manipulations suggest that autonomous motivation is relatively resistant to health behavior messaging compared to controlled motivation. However, other research indicates that autonomous motivation may be increased when these messages are not perceived as controlling (Legate et al., 2022). Nevertheless, once established, autonomous motivation was reliably associated with health behavior across these studies, whereas controlled motivation was not (Legate et al., 2021; 2022; Morbée et al., 2021; Schmitz et al., 2020). The presented findings suggest empathy as one potential variable that indirectly influences autonomous motivation.

Moreover, other potential face mask use and vaccination predictors were not investigated. In light of changing COVID-19 health protocols, many individual difference and motivation variables are differentially associated with wearing face masks (Leffler et al., 2020; Schmid et al., 2017). These variables could serve as distal predictors or moderators of individuals' motivation of these prosocial health behaviors within SDT. Additionally, the social perspectives presented are further affected by geographic concerns; the samples here consisted of United States university students within Texas. Nevertheless, the sample is unique because local governments no longer enforced mask-wearing policies at the time of data collection, and face masks were completely voluntary, albeit recommended. This contrasts with other studies on autonomous motivation for

health behavior, which were conducted in contexts where compliance was enforced (e.g., Legate et al., 2021).

Lastly, Studies 1 and 2 were largely exploratory and obtained smaller samples than expected after checking data quality. Although direct associations were consistent with the preregistered hypotheses, the models tested in Studies 1 and 2 were not preregistered. We preregistered and tested Study 3's mediation models with a larger sample size. Study 3 successfully replicated these results while extending the roles of autonomous and controlled motivation to engage in prosocial health behaviors to flu vaccination status.

Conclusions

Prosocial health behaviors are integral to fostering community health and mitigating infection spread. In this set of three preregistered studies, we find support for integrating prosocial health behavior with an SDT perspective. Dispositional empathy was linked with prosocial health behavior through autonomous motivation to protect others from possible illness, whether by voluntarily wearing a face-mask during COVID-19 or receiving a flu vaccination. In conclusion, autonomous motivation seems to be an important factor when predicting and evaluating health behavior compliance.

Table 1

Study 1 Correlations Between Key Variables

Variable	1	2	3	4	5
IAF	–				
Mask Attitudes	.17 **	–			
Empathy	.29 ***	.22**	–		
Prosocial Behavior	.14*	.09	.33 ***	–	
Freq. of Mask Use	.03	.38 ***	.21**	.08	–
M	3.54	2.12	3.46	2.92	5.83
SD	0.53	1.04	0.62	0.52	1.71

Note. $N = 264$. IAF = index of autonomous functioning; Freq. of Mask Use = frequency of mask use, higher scores on mask attitudes reflect more positive attitudes toward face masks.

$^{*}p < .05$. $^{**}p < .01$. $^{***}p < .001$.

Table 2. *Motivation Toward Face Mask Use Items, Factors, and Factor Loadings for Study 2*

	Factor 1 (Autonomous Motiv.)	Factor 2 (Controlled Motiv.)
1. Because I like the feeling I get when I wear a face mask.	.38	.33
2. For the pleasure of contributing to protecting others.	**.85**	–.10
3. Because it seems to me that taking care of myself and protecting others are inseparable.	**.75**	–.14
4. Because protecting others has become a fundamental part of who I am.	**.89**	.12
5. Because it is important to protect others.	**.85**	–.02
6. Because it is a reasonable thing to do to help the COVID-19 pandemic.	**.62**	–.40
7. Because I think I'd regret not doing something about the COVID-19 pandemic.	**.75**	.18
8. Because I'd feel guilty if I didn't protect others.	**.77**	.23
9. Because other people would be mad if I didn't wear a face mask in public.	.23	**.51**
10. Because my friends insist that I do.	.18	**.67**
11. I feel that doing something about the COVID-19 pandemic is a waste of time.	–.28	**.64**
12. I can't see how my efforts to wear a face mask are helping with the COVID-19 pandemic.	–.13	**.59**

Note. Items in bold were retained for each factor for Study 3. Motiv. = Motivation.

Table 3. *Study 2 Correlations Between Key Variables*

Variable	*M*	*SD*	1	2	3	4	5	6	7
1. Aut. Motiv.	5.37	1.48	–						
2. Con. Motiv.	1.59	1.02	– .26**	–					
3. Mask Use	5.38	1.80	.47***	– .20*	–				
4. Mask Attitudes	2.18	.93	.19*	– .54***	.33**	–			
5. IAF	3.64	.48	.19*	– .17	– .14	– .04	–		
6. Prosocial Behavior	2.92	.56	.21*	.24**	.10	–.20*	.01	–	
7. Empathy	3.52	.66	.32**	.05	.22*	.05	.24**	.41***	–

Note. $N = 127$. Aut. Motiv. = autonomous motivation, Con. Motiv. = controlled motivation, IAF = index of autonomous functioning.

* $p<.05$ ** $p<.01$ *** $p<.001$.

Table 4

Direct and Indirect Effects Between Dispositional Empathy – Flu Vaccination via Autonomous and Controlled Motivation

Effect	*Estimate*	*BSE*	95% CI [LL, UL]	*z*	*p*
Direct Effects					
Emp. → Aut. Motiv.	1.242	.141	[.957, 1.510]	8.83	<.001
Emp. → Con. Motiv.	– .134	.113	[–.354, .087]	– 1.19	.234
Aut. Motiv. → Vacc.	.132	.017	[.099, .165]	7.79	<.001
Con. Motiv. → Vacc	–.037	.024	[–.083, .012]	–1.53	.125
Conditional Indirect Effects					
Emp.→Aut. Motiv.→ Vacc.	.164	.029	[.111, .225]	5.68	<.001
Emp.→Con. Motiv.→Vacc.	.005	.006	[–.004, .020]	.81	.418
Total Effects					
Emp.→Aut. Motiv. →Vacc.	.065	.051	[–.035, .162]	1.28	.201
Emp.→Con. Motiv.→Vacc.	.079	.052	[–.027, .179]	1.51	.130

Note. BSE = bootstrapped standard error, CI = confidence interval, LL = lower limit, UL = upper limit, Emp. = empathy, Aut. Motiv. = autonomous motivation, Con. Motiv. = controlled motivation, Vacc. = flu vaccination status. Flu vaccination status was dummy-coded such that 0 = No and 1 = Yes.

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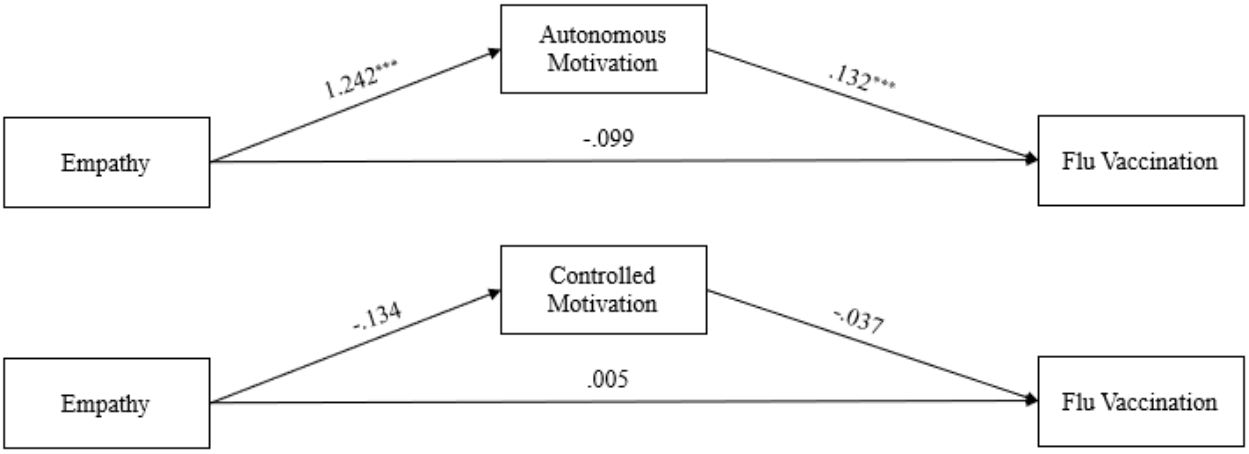
Figure I. Direct effects of empathy on flu vaccination through autonomous motivation and controlled motivation.



Note. Flu vaccination status was dummy-coded such that 0 = No and 1 = Yes. The value between empathy and flu vaccination represents the direct effect controlling for autonomous motivation or controlled motivation. All effects are unstandardized. $^{***}p < .001$