Taking Care of Each Other: How Can We Increase Compliance with Personal Protective Measures During the COVID-19 Pandemic in Chile?

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In the context of the COVID-19 pandemic, personal protective measures (e.g., social distancing, handwashing, and mask wearing) have been adopted as a cornerstone to limit the spread of the disease. Yet, the effectiveness of these measures depends on people’s levels of adherence. In this article, we apply social-psychological research to the study of compliance with personal protective measures during the COVID-19 pandemic in Chile. We consider three possible models underlying adherence: (1) sociodemographic and socioeconomic factors, (2) instrumental factors, and (3) normative factors. We draw on data from a longitudinal nonrepresentative panel study (Study 1, n = 32,304) and a cross-sectional representative survey (Study 2, n = 1,078) to explore the impact of these different factors on personal protective measures compliance. Findings show the strongest support for the role of instrumental and normative factors, in that people who comply with protective measures report to a greater extent that relatives and friends comply too and tend to perceive high risk of COVID-19. We finish by proposing policy recommendations to promote effective strategies to contain the spread of the virus.

KEY WORDS: COVID-19, protective personal measures, compliance, social norms, risk perception
During the COVID-19 pandemic, personal protective measures—such as social distancing, handwashing, and mask wearing—have been adopted to limit the spread of the virus across the world. Yet, the effectiveness of these measures depends on people’s levels of adherence. Chile is a particularly interesting case to study compliance with personal protective measures because (1) it is a highly unequal country with stratified access to the health care system (Goic, 2015) and to practical possibilities of complying during the COVID-19 pandemic; (2) previous to the pandemic (since October 2019), Chile went through a period of political unrest in which protesters took to the streets to demand structural changes to the political and economic systems, a process in which there has been strong police repression and a significant decrease in the legitimacy of authorities; and (3) lockdown recommendations (such as stay-at-home measures) and restrictions (i.e., compulsory lockdown) have shown lower effectiveness in reducing mobility than in other countries (Olivares et al., 2020), while a high percentage of people in Chile report not complying with handwashing, mask wearing, and social distancing (MOVID-Impact, 2021). Chile is now considered one of the countries with the worst outcomes in terms of the number of cases and mortality per population due to COVID-19 (Canals et al., 2020; Lowy Institute, 2021).

In this article, we apply social-psychological research to the study of compliance with personal protective measures during the COVID-19 pandemic in Chile, by comparing three models of compliance. First, we look at sociodemographic and socioeconomic factors that might facilitate compliance for some people more than others. For example, people who work will find it more difficult to stay at home and to maintain social distance than students. Second, we consider instrumental factors according to which people comply to maximize personal benefits and reduce the risk of contagion. The perceived risk of COVID-19 for health as well as the risk of being punished for not complying might encourage people to adhere to the different preventive measures. Finally, we evaluate the role of normative factors, focusing on people’s perceptions that they should adhere to these recommendations because it is the right thing to do. The focus here is on the conformity with and the internalization of social norms. We consider the role of perceived social norms (i.e., whether friends and family stay at home too) and perceived legitimacy of health authorities (as legitimacy fosters the belief that the right thing to do is to follow the authorities’ guidelines) as two important factors for compliance.

Our contribution is threefold. First, although there is previous research on the role of sociodemographic, socioeconomic, instrumental, and normative factors on compliance with personal protective measures, we argue that it is necessary to better understand their role in a non-WEIRD population (western, educated, industrialized, rich, and democratic societies; Henrich, Heine, & Norenzayan, 2010).
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2010). Second, the case of Chile is especially interesting given that it is one of the most unequal countries in the world, and recently a wave of intense social protests demanding social change has reduced levels of the authorities’ legitimacy to historically low levels (Latinobarómetro, 2020). Group categories and intergroup conflict are highly salient and relevant in such a fragmented society, therefore previous findings might not be necessarily replicated in this context. Specifically, whereas we can expect that family and friends’ norms will be strong predictors of compliance as previous literature shows, it remains to be examined whether legitimacy of health authorities is a relevant predictor. Finally, advancing the understanding of the motivations underlying compliance is relevant not the least because it can inform policy recommendations and the implementation of interventions to encourage compliance with preventive measures. Analyzing the predictors of compliance in an unequal country such as Chile, with low levels of legitimacy of authorities, in turn, might shed light on specific socioeconomic conditions that can affect the successful implementation of interventions, hereby avoiding perpetuating social inequalities in the consequences of the pandemic (Templeton et al., 2020).

We first describe Chile’s health system and the strategies adopted during the COVID-19 pandemic. Second, we discuss three perspectives that can help understand compliance from a social-psychological perspective. We then present findings from two studies conducted in Chile during the year 2020: a longitudinal nonrepresentative panel study (Study 1, \( n = 32,304 \)) and a cross-sectional representative survey (Study 2, \( n = 1,078 \)). Study 1 measures people’s compliance with stay-at-home regulations during a first phase of strategies to confront the pandemic in Chile, while Study 2 focuses on compliance with other protective measures such as handwashing and mask wearing. We finish by discussing the findings and presenting possible avenues for policy recommendations.

### Chile: Health System and Adopted Strategies During the COVID-19 Pandemic

Since the arrival of SARS-COV-2 in March, several measures have been adopted to reduce the virus spread and to improve the health-care system capacity in Chile (Canals et al., 2020; Martínez, Cuadrado, Goyenechea, Fica, & Peña, 2020). First, in mid-March, schools and universities were closed, and a national catastrophe state was declared. Then, between March 16 and 26, a national overnight curfew was adopted, as well as restrictions on public gatherings, quarantine of close contacts of COVID-19 cases, quarantine of older adults, and a 14-day quarantine to returning travelers. In the beginning, most COVID-19 cases were reported in richer neighborhoods of the city of Santiago, the capital of the country. Such cases were mostly related to international traveling and the return of people from higher social classes. In this line, the government started implementing small-area lockdowns, called “dynamic quarantines,” according to the number of infections by neighborhoods within the country’s capital and in other cities in the country. By April 21, the government introduced the concept of “New Normality,” calling on the population to return to normal activities. Over the following month, there was a sharp increase in the number of cases and occupation of ICU beds, followed by larger and stricter lockdown restrictions in different parts of the country. In June, a big controversy over the number of deaths due to COVID-19 and the failure of the dynamic quarantines in controlling the pandemic occurred. The latter led the Health Minister to resign. Since August, a phased reopening took place, through a “step by step” program with four different phases to be implemented according to the rate of infections. By February 2021, the program of mass vaccination was implemented.

Despite Chilean authorities being very confident regarding their strategy to deal with the pandemic, lockdown implementation has shown lower effectiveness in reducing mobility than in other countries. Overall, stay-at-home requirements have shown a sharp decrease in mobility across countries (Warren & Skillman, 2020). For instance, in France, the lockdown reduced by 65% the countrywide number of trips (Pullano, Valdano, Scarpa, Rubrichi, & Colizza, 2020), while in Santander (Spain), the overall mobility decreased by 76% (Aloi et al., 2020). Nevertheless, in Chile, lockdowns did not show the expected size of the effect: Mobility data shows that the lockdown in Santiago reduced mobility by only 35.8% compared to prepandemic mobility (Olivares et al., 2020).
Understanding Compliance with Individual Protective Measures from a Social-Psychological Perspective

Sociodemographic and Socioeconomic Antecedents

There are different sociodemographic and economic variables that may lead to reduced compliance with personal protective measures among people. Previous studies have found that younger people are less likely to implement safe health practices in different aspects of life (Underwood, 2019), putting themselves at greater risk. The same might be expected for COVID-19, especially because younger people may perceive their group to have lower associated health risks. Moreover, Mohammadpour and colleagues (2020) showed that women are more likely to follow social distancing measures than men, and Smith et al. (2020) showed the same for self-isolation. This might be because, traditionally, women provide care for other family members and are therefore more focused on protecting others and themselves. Health risks and security might also be relevant predictors of compliance. People with medical conditions (e.g., cardiovascular diseases or diabetes) associated with worse outcomes in case of a COVID-19 infection (Williamson et al., 2020) and those with health-insurance related insecurity might be more likely to follow protective measures. In Chile, the health system is divided between public and private health systems, with people from higher socioeconomic groups adhering to private health insurances that provide better care and people from lower socioeconomic status relying on the public health system, which is underfunded and overcrowded (Goic, 2015). Thus, people from lower socioeconomic status are more exposed to risks related to a COVID-19 infection and may, therefore, comply more with protective measures. Paradoxically, this may interact with other factors that can put people with lower socioeconomic status at greater risk of contracting COVID-19.

In a different vein, compliance with individual protective measures during the pandemic is also affected by several socioeconomic factors. Research has shown that people with lower socioeconomic status comply less with shelter-in-place policies within different counties in the United States (Wright, Sonin, Driscoll, & Wilson, 2020) and in the United Kingdom (Atchison et al., 2020). Previous research has shown that lockdown compliance in the United States and the United Kingdom was associated with people’s practical capacity to obey these rules (Kooistra et al., 2020; Van Rooij et al., 2020; Webster et al., 2020), showing that people will follow these rules more when they have the possibility to do so. Given that Chile is one of the most unequal countries in the world, we hypothesize that compliance will vary depending on sociodemographic and socioeconomic factors that facilitate or obstruct people’s possibilities to comply with personal protective measures. People of lower socioeconomic status and educational levels might have more difficulties staying at home because this would mean risking their means of subsistence. The same should be true for those who work and cannot risk staying home and losing their work. Those who work will also find it more difficult to comply with social distancing given that they need to commute to work and share a workspace with other people.

Instrumental Factors

Research on compliance with rules and laws highlights two different motivations underlying people’s adherence: instrumental and normative motives (e.g., Jackson et al., 2012; Murphy, Williamson, Sargeant, & McCarthy, 2020; Tyler, 2006). From an instrumental perspective, people—conceived as rational actors—are expected to act in ways that maximize benefits and reduce losses at a personal level. When deciding whether to comply with a specific law, people analyze the risks of getting caught and assess whether these outweigh the benefits of noncompliance. In relation to COVID-19, noncompliance involves at least two risks: the risk of viral infection and the risk of punishment for violating rules. One could expect higher compliance among those who tend to perceive higher health-related risks and those who believe that it is likely they will get caught if they do not
comply. Consistently, Murphy et al. (2020) found that among Australian respondents, the risk of sanction and the risk of others getting sick increased compliance with COVID-19 distancing measures. Surprisingly, the perceived risk of people getting sick themselves was not related. Interestingly, the role of group processes should also be considered for COVID-19-related risk taking. It has been shown that when the threat comes from an ingroup member, individuals perceive less risks and might engage to a greater extent in taking risk behavior than threats that emerge from an outgroup member (Cruwys et al., 2021).

Normative Factors

While instrumental factors may play a role, research has shown that individuals often act in ways that are not motivated by self-interest. From a normative point of view, people conform to social norms and expectations, internalizing norms as obligations and complying because it ‘is the right thing to do’ (Tyler, 2006). Compliance can be fostered when authorities communicating protective measures are perceived as legitimate and the adherence to their guidelines is considered the right thing to do. The same might be true when relevant others around us follow certain rules: Research has consistently shown that social norms predict compliance.

First, research on legitimacy of authorities—that is, the belief that authorities have the right to prescribe appropriate behavior—concludes that recognizing an institution or authority as legitimate fosters a perceived duty to obey and comply with the authorities’ mandates (Jackson et al., 2012; Tyler, 2006). Research shows that perceived legitimacy of authorities predicts compliance even controlling for people’s risk perceptions and their personal preferences on a particular behavior (e.g., Tyler & Jackson, 2014). As such, one relevant factor in predicting people’s compliance with personal protective measures during the COVID-19 pandemic might be whether they perceive authorities to be legitimate actors. Consistently, Murphy et al. (2020) found a significant effect of perceived duty to obey (a measure of legitimacy) on compliance with COVID-19 social distancing measures in Australia. Similarly, a stronger sense of shared national identity (Van Bavel et al., 2020) and identifying with your community (Stevenson, Wakefield, Drury, & Felsner, 2020) predict adherence to COVID-19 preventive measures, while family identification predicts more protective behaviors, such as physical distancing (Vignoles, Jaser, Taylor, & Ntontis, 2021). Also, research has highlighted the importance of an adequate communication of information by authorities, both about the disease outbreak and the quarantine protocol, to increase adherence (Webster et al., 2020). It remains to be seen whether legitimacy will be a relevant predictor of compliance in Chile. Previous research has shown that legitimacy becomes a more relevant predictor of different outcomes when people identify with the group being represented by the authority (e.g., Gerber et al., 2018). In Chile, in the context of the social uprising that started in October 2019, authorities have been strongly criticized as being responsible for human rights violations (United Nations, 2019) leading to historically low levels of trust in institutions among people (e.g., CEP-Chile, 2019). In addition, the civil society has been critical of the way in which health authorities have dealt with the pandemic (Martínez et al., 2020). It is thus not clear whether perceived legitimacy of Chilean authorities will promote compliance with personal protective measures.

A second normative factor are social norms. Social norms provide relevant information regarding how to behave (e.g., Schultz, Nolan, Cialdini, Goldstein, & Griskevicius, 2007), based on other’s behavior, opinions, and evaluations. They guide individual’s behavior and are in general positively associated with compliance (e.g., Benneker, Gërxhani, & Steinmetz, 2020). Interestingly, under threatening conditions, groups engineer stronger norms and show higher adherence levels and higher punishment for those who deviate from the norm (Roos, Gelfand, Nau, & Lun, 2015). Presumably, in hazardous circumstances, such as ecological disasters or territorial threats, the need to coordinate is critical in order to survive (see Gelfand et al., 2011), and, therefore, we could expect that under the COVID pandemic, compliance with social norms—captured in this study as perceptions about
family and friends following lockdown measures—might reach higher levels, given the health, social, and economic difficulties faced. For instance, a cross-sectional study in the United Kingdom about factors underlying compliance to lockdown in symptomatic households showed that adherence was related to the estimate of how many other people were following lockdown rules (Smith et al., 2020). Additionally, research in the United Kingdom suggests that a perceived social norm of community disapproval for noncompliers of preventive measures explained a higher lockdown adherence (Jackson et al., 2020).

In the same line, shared human values have been suggested as important factors in the adherence to guidelines (Wolf, Haddock, Manstead, & Maio, 2020). Thus, people with higher self-transcendence (e.g., helpfulness, empathy) and conservation (e.g., security) values would have a higher compliance to COVID-19 guidelines. These values are important both at a personal level and a community level, because if people perceive that others share their values leaning to rules compliance, they have a higher probability of adhering too (Wolf et al., 2020). Similarly, Goldberg et al. (2020) found that social norms focused on family members and friends significantly predicted distinct types of preventive behaviors, such as not shaking hands, covering one’s mouth, and keeping physical distance, among others.

This Research

In this article, we test the effect of (1) sociodemographic and socioeconomic, (2) instrumental, and (3) normative factors on Chilean citizens’ adherence to individual protective measures during the COVID-19 pandemic. In line with previous knowledge on compliance with individual protective measures during the COVID-19 pandemic, we expect that:

\[ H1 \]: Women, older people, people with higher educational levels, people with COVID-19-associated health risks, people without health insurance, and people who do not need to work out of their homes will comply more with personal protective measures.

\[ H2 \]: People who perceive the virus to be more threatening and those who perceive strong legal enforcement will show more compliance with personal protective measures.

\[ H3 \]: People who feel normatively compelled to adopt protective measures (either because of social norms that indicate the right behavior or because of the perceived legitimacy of health authorities) will comply more with these measures.

To test these hypotheses, we present two studies conducted in Chile during the COVID-19 pandemic. In Study 1, we present data from a longitudinal online study (MOVID-19, 2020) that has sought to analyze symptoms and social practices in relation to the pandemic among Chilean people across time. In Study 2, we present the results of a representative telephone survey study (MOVID-Impact, 2021) in which Chilean participants were asked about different sociodemographic and socioeconomic, instrumental, and normative factors, as well as their level of compliance with personal protective measures during the pandemic.

STUDY 1: MOVID-19

Method

Research Design

Study 1 consists of an online longitudinal survey conducted between July 27 and August 30 2020 among people 18 years and older in Chile. This study is a collective project put forward by a
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Taking care of each other during the COVID-19 pandemic was the main objective of a study conducted by a group of researchers from different Chilean universities and different disciplines (e.g., public health, sociology, psychology, medicine). It received funding and support from Universidad de Chile, the Chilean college of physicians (Colegio Médico de Chile), Universidad Diego Portales, Universidad San Sebastián, Universidad Central, and Universidad de la Frontera.

Sample

The study considered a nonprobabilistic sample with participants invited through social media, massive mailings, and press. Data used for this analysis include 32,533 individuals and 92,372 observations for five waves of follow-up with, on average, 19,339 responses per week (week 1, n = 17,890; week 2, n = 17,390; week 3, n = 21,130; week 4, n = 18,180; week 5, n = 17,782). 69.1% of the sample are women, 19.9% are between 18 and 39 years old, 54.5% are between 40 and 64 years old, and 25.6% are 65 years or older.

Measures

Respondents were asked the frequency of out-of-home activities during the past week (e.g., going to work, recreational activities, visiting other persons). Responses were recoded into those that left home for at least two activities during the last week (1 = left home at least two times in the previous week, 0 = did not leave home at least two times in the previous week). It should be highlighted that at the time the survey was conducted lockdowns were very strict and only allowed people leaving the house with a specific permit (e.g., for medical reasons or grocery shopping) up to two times a week. Overall, 35.3% respondents reported having left home at least twice during the last week at the beginning of the data collection, while 47.4% did so the last week of follow-up.

Sociodemographic and Socioeconomic Factors

Respondents were asked to report their sex (0 = Woman, 1 = men), age, and education level (recoded in three categories: High school or less, technical qualification, and University degree). Occupation was defined as 1 for those who work and 0 otherwise. Health risk factor was established asking respondents whether they were currently diagnosed with a list of eight illnesses and health conditions: arterial hypertension, obesity, diabetes, chronic respiratory diseases (asthma, emphysema, or other), cardiovascular diseases, active cancer, chronic kidney disease, or immunodeficiencies. Respondents were also asked which health insurance they had (public, private, other, none). County of residency was used to assess whether people lived in areas under mandatory lockdown when completing the survey. We thus control for whether respondents live in an area under lockdown when completing the survey.

Instrumental Factors

Perceived risk of COVID-19 was captured through the question ‘How dangerous do you think Coronavirus is for you and your closest ones?’ (1 = Not at all dangerous, 2 = Somewhat dangerous, 3 = Pretty dangerous, 4 = Very dangerous, 5 = Extremely dangerous).

Normative Factors

Perceived social norms were captured asking respondents ‘How many of your friends and/or family members have followed the recommendation of staying home due to coronavirus?’ (1 = None,
2 = A few, 3 = Some, 4 = A fair amount 5 = Most, 6 = All). Since few respondents reported that none (0.05%), a few (0.2%), some (1.14%), or a fair amount (6.59%) of their friends and/or family members had followed the recommendation, these four options were collapsed into the category “low social norms” while categories “most” and “all” were collapsed into the category “high social norms.”

**Analysis**

Logistic multilevel regression models nested by repeated measures for each individual over time were estimated to predict the likelihood of leaving home at least two times per week (i.e., noncompliance with stay-at-home recommendations). We included as predictors sociodemographics and socioeconomic antecedents (sex, age, education level, and occupation), health-related variables (health risk factor and health insurance), living in an area under mandatory lockdown, perceived risk of COVID-19, perceived social norms, and time fixed effects. All models were estimated using R version 4.0.1.

**Results**

Sociodemographic and socioeconomic factors were relevant predictors of stay-at-home compliance. We found that males ($OR = 3.26, p < .01$), younger persons ($OR = .98, p < .01$) and active workers ($OR = 3.98, p < .01$) were more likely to report going out during the last week (Table 1). People with a university degree were less likely to leave home than people with high school or less education ($OR = .72, p < .01$). Persons living in areas under mandatory lockdown showed decreased odds of getting out-of-home two or more times a week ($OR = .38; p < .01$). Interestingly, in MOVID-19 reporting a health risk factor for COVID-19 decreased the probability of going out ($OR = .82, p < .01$). Moreover, over time the probability of reporting more than two out-of-home activities increased ($OR = 1.21, p < .01$).

**Table 1. Logistic Multilevel Regression Models Predicting Odds of Leaving Home at Least for Two Activities Per Week ($n = 32,304; 96,695$ Observations)**

| Leaving Home More Than Twice or More a Week | $OR$ | $p$ |
|--------------------------------------------|------|-----|
| Intercept | .32 | <.01 |
| **Sociodemographics** | | |
| Sex (1 = Men) | 3.26 | <.01 |
| Age (years) | .98 | <.01 |
| Health risk factor (1 = Yes) | .82 | <.01 |
| Education (ref: high-school or less) | | |
| Technical qualification | 1.01 | .90 |
| University degree | .72 | <.01 |
| Health insurance (ref: None) | | |
| Public | .62 | <.01 |
| Private | .41 | <.01 |
| Other | .56 | <.01 |
| Occupation (1 = Works) | 3.98 | <.01 |
| Live in an area under lockdown (1 = Yes) | .39 | <.01 |
| Time (weeks) | 1.21 | <.01 |
| **Instrumental factors** | | |
| Perceived risk | .64 | <.01 |
| **Normative factors** | | |
| Perceived social norms | .43 | <.01 |

Bold values indicate $p < .05$. 
Both instrumental and normative factors were important predictors of the decision to stay-at-home. A high perceived risk reduced the probability of leaving home across all models. For each point increase in the perceived threat of COVID-19, the odds of leaving home at least twice a week decreased in 36% ($OR = .64$, $p < .01$). Interestingly, the effect of perceived social norms on compliance had an effect as big as the implementation of mandatory lockdown in an area, reducing in 57% the odds of leaving home at least twice in a week ($OR = .43$, $p < .001$). Figure 1 illustrates the estimated probabilities of leaving home at least twice for relevant explanatory variables.

**STUDY 2: MOVID IMPACT**

**Method**

*Research Design*

Study 2 consists of a telephone survey conducted between December 4 and 22, 2020, to a sample of 18 years or older living in private homes in urban areas in Chile. The questionnaire was designed by the same research team mentioned in Study 1. It measured a range of social, economical, and health outcomes related to COVID-19. The fieldwork was conducted by Centro UC de Encuestas y Estudios Longitudinales and financed with a grant from the Chilean Ministry of Science (ANID-COVID N° 960).

*Sample*

A sampling frame was constructed through a multistage geographically stratified sampling procedure. A random sample was then extracted, yielding a sample of 1,261 complete responses. Of the sample, 61.9% were women, 36% were between 18 and 39 years old, 40.8% were between 40 and 64 years old, and 23.2% were 65 years or older.

*Measures*

**Compliance with COVID-19 Individual Preventive Measures**

Respondents were asked about the frequency with which they performed five COVID-19 preventive measures during the last week (1 = *Almost never*, 2 = *Sometimes*, 3 = *Frequently*, 4 = *Almost always* or 5 = *Always*): washing hands for 20 seconds, keeping at least two meters away from people, avoid meeting more than 10 people in a closed place, wearing a mask outside their home, and wearing a mask when meeting other people in a closed place. Responses were recoded in dichotomous variables given that they were highly skewed towards compliance (0 = *almost never* to *almost always*; 1 = *always*). Overall compliance was high in relation to using masks outside the home (92.4%), with fewer people complying with hand washing (70%), using masks in closed places (69.7%) and avoid being with more than 10 people in closed places (65.7%). Social distance was the measure least complied with (56%).

**Sociodemographic and Socioeconomic Factors**

Respondents were asked to report their sex (0 = Woman, 1 = Men), their age (in years) and their educational level. Education was recoded in three categories: High school or less (reference category), technical qualification, and University degree. Occupation was measured asking respondents
‘During the last week, did you work at least one hour, excluding domestic tasks?’ (0 = No, 1 = Yes). Health risk factor was established asking respondents whether they were currently diagnosed with a list of four illnesses and health conditions: arterial hypertension, diabetes, chronic respiratory

Figure 1. Estimated probabilities of leaving home at least twice in a week dependent on relevant explanatory factors (n = 32,304).
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Diseases (asthma, emphysema, or other), and cardiovascular diseases. Respondents who presented at least one of these conditions were considered as presenting a health risk factor. Respondents were also asked which health insurance they had (public, private, other, none). County of residency was used to assess whether people lived in areas under mandatory lockdown the previous week when answering the survey.

Instrumental Factors

Instrumental factors were captured through two variables. As in Study 1, respondents were asked to estimate their perceived risk of COVID-19 through the question ‘How dangerous do you think Coronavirus is for you and your closest ones? (1 = Not at all dangerous, 2 = Somewhat dangerous, 3 = Pretty dangerous, 4 = Very dangerous, 5 = Extremely dangerous). Second, participants were asked about their perception of legal enforcement while going out. Specifically, they were asked to rate their agreement with the statement “In Chile, if a person goes out without permission during a lockdown, it is very unlikely that this person will be inspected and punished” (1 = Strongly disagree to 5 = Strongly agree). Since most respondents reported agreeing (82.5%), strongly agree (18.3%) and agree (64.2%), and indifferent (4.7%) were recoded into the category “low legal enforcement,” while disagree (11.4%) and strongly disagree (1.3%) were collapsed into the category “high legal enforcement.”

Normative Factors

Perceived social norms were captured asking respondents, ‘Thinking about different coronavirus care measures (staying at home, wearing a mask, keeping social distance or washing your hands), to what extent would you say that your closest ones (people who live with you or your family) comply with these recommendations?’ (1 = Not at all, 2 = A little, 3 = Somewhat, 4 = A fair amount, 5 = To a large extent, 6 = Completely). Since few respondents reported not at all (0.6%), a little (1.8%), somewhat (4.9%), and a fair amount (17.9%) of their friends and/or family members had followed the recommendation, these four options were collapsed into the category “low social norms” while to a large extent (40%) and completely (42.8%) were collapsed into the category “high social norms.” To capture the perceived legitimacy of health authorities, participants were asked to rate on a scale from 1 (Strongly disagree) to 5 (Strongly agree) their level of agreement with the following statement “Even if we sometimes disagree with the health authorities and the measures they propose, it is our duty to accurately follow their indications.” This statement measures felt obligation to obey, a concept often used to capture legitimacy of authorities (e.g., Tyler & Jackson, 2014).

Analysis

Five logistic regressions models were estimated using R version 4.0.1 to predict the likelihood of compliance with the five personal protective measures. All models included sociodemographic and socioeconomic (sex, age, education level, and occupation) and health-related variables (health risk factor and health insurance), instrumental factors (perceived risk and perceived legal enforcement), and normative factors (perceived social norms and legitimacy in authorities) as predictors.

Results

Results are presented in Table 2. Sociodemographic and socioeconomic factors have some influence on people’s compliance with protective measures. While there were no significant differences between men and women as in Study 1, older people tended to avoid to a greater extent meeting
more than 10 people in a closed place \((OR = 1.01, p = .041)\) and wearing a mask when meeting other people in a closed place \((OR = 1.02, p = .002)\). Educational level was not a relevant predictor for most measures. However, people with technical qualification were more likely than those with high school or less to avoid meeting more than 10 people in a closed place \((OR = 1.59, p = .026)\). In contrast with what was expected, health insurance and health risk factor did not make a difference in people’s levels of adherence. As expected, people who work were less likely to keep at least 2 meters away from people \((OR = 0.60, p < .001)\) and to avoid meeting more than 10 people in a closed place \((OR = .70, p = .013)\). Finally, living in an area under lockdown reduced chances of wearing a mask when meeting other people in a closed place \((OR = .69, p = .011)\).

Instrumental factors were significant predictors of all care measures. First, higher perceptions of coronavirus risk for the respondent and those close to him/her related to higher probabilities of washing hands \((OR = 1.71, p = .014)\), keeping at least 2 meters away from people \((OR = 1.43, p < .001)\), avoid meeting more than 10 people in a closed place \((OR = 1.32, p < .001)\), wearing masks outside the home \((OR = 1.64, p < .001)\), wearing a mask when meeting other people in a closed place \((OR = 1.21, p = .006)\). Second, we also found that among those perceiving that there is legal enforcement there was a higher likelihood of keeping at least 2 meters away from people \((OR = 1.82, p = .032)\), and wearing a mask when meeting other people in a closed place \((OR = 1.46, p = .033)\).

In relation to normative factors, those who perceived a high level of compliance by those close to them were more likely to wash their hands for 20 seconds \((OR = 1.55, p = .003)\), keep at least 2 meters

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**Table 2. Binary Logistic Regression Models Predicting Odds of Complying With Personal Protective Measures (MOVID-Impact, \(n = 1,261\))**

|                           | Washing Hands for More Than 20 seconds | Keeping at Least 2 m. Away from People | Avoid Meeting More Than 10 People in Closed Place | Wearing a Mask Outside Their Home | Wearing a Mask When Meeting Other People in Closed Place |
|---------------------------|--------------------------------------|----------------------------------------|---------------------------------------------------|-----------------------------------|-----------------------------------------------------|
| Intercept                 | .29                                  | .021                                   | .20                                               | .002                              | .73                                                 | .566                                               | 3.87                              | .160                              | .51                               | .235                              |
| **Sociodemographic and socioeconomic factors** |                                      |                                        |                                                   |                                   |                                                   |                                                   |                                   |                                   |                                   |                                   |
| Sex (1 = Men)             | .86                                  | .261                                   | .82                                               | .133                              | .93                                                 | .587                                               | 1.17                              | .530                              | .97                               | .834                              |
| Age                       | 1.01                                 | .182                                   | 1.00                                              | .416                              | **1.01**                                             | **.041**                                           | 1.00                              | .904                              | **1.02**                          | **.002**                          |
| Education (ref: high school or less) |                                      |                                        |                                                   |                                   |                                                   |                                                   |                                   |                                   |                                   |                                   |
| Technical qualification   | 1.42                                 | .094                                   | 1.08                                              | .712                              | 1.59                                                 | .026                                               | 1.29                              | .491                              | 1.24                              | .316                              |
| University degree         | 1.38                                 | .063                                   | 1.00                                              | .982                              | 1.24                                                 | .217                                               | 1.31                              | .397                              | .93                               | .702                              |
| Health risk factor (1 = Yes) | 1.28                                 | .127                                   | 1.25                                              | .144                              | 1.26                                                 | .149                                               | 1.39                              | .271                              | 1.26                              | .182                              |
| Health insurance (ref: None) |                                      |                                        |                                                   |                                   |                                                   |                                                   |                                   |                                   |                                   |                                   |
| Private                   | 1.04                                 | .902                                   | .64                                               | .193                              | .55                                                 | .110                                               | 1.28                              | .745                              | .96                               | .902                              |
| Public                    | 1.26                                 | .429                                   | .82                                               | .512                              | .57                                                 | .088                                               | .45                               | .212                              | .94                               | .835                              |
| Other                     | 1.74                                 | .398                                   | .90                                               | .859                              | .63                                                 | .501                                               | .57                               | .643                              | 1.38                              | .662                              |
| Occupation (1 = Works)    | 1.16                                 | .294                                   | .60                                               | <.001                             | .70                                                 | .013                                               | .84                               | .502                              | .98                               | .910                              |
| Live in an area under lockdown (1 = Yes) | .96                                  | .764                                   | .86                                               | .260                              | 1.02                                                 | .869                                               | .87                               | .580                              | .69                               | .011                              |
| **Instrumental factors**  |                                      |                                        |                                                   |                                   |                                                   |                                                   |                                   |                                   |                                   |                                   |
| Perceived risk            | 1.17                                 | .014                                   | 1.43                                              | <.001                             | 1.32                                                 | <.001                                              | 1.64                              | <.001                             | 1.21                              | .006                              |
| Perceived legal enforcement | 1.29                                 | .141                                   | 1.45                                              | .030                              | 1.34                                                 | .092                                               | 1.82                              | .032                              | 1.46                              | .033                              |
| **Normative factors**     |                                      |                                        |                                                   |                                   |                                                   |                                                   |                                   |                                   |                                   |                                   |
| Perceived social norms    | 1.55                                 | .003                                   | 1.53                                              | .005                              | 1.19                                                 | .246                                               | 1.56                              | .083                              | 1.89                              | <.001                             |
| Legitimacy of health authority | 1.04                                 | .658                                   | 1.09                                              | .343                              | .90                                                 | .216                                               | .76                               | .068                              | .87                               | .120                              |

**Bold values indicate** \(p < .05\).
away from people ($OR = 1.55, p = .005$), and to wear a mask when meeting other people in a closed place ($OR = 1.89, p < .001$). On the other hand, and against expectations, the legitimacy of health authorities presented no significant effect on the adherence to any of the health measures (Figure 2).

**Figure 2.** Estimated probabilities of keeping at least 2 meters away from people ($n = 1,261$).
Discussion and Conclusions

Summary of Findings

Our findings are consistent with previous research indicating that older people, people with higher educational levels, and those who do not work are more likely to comply with personal protective measures (H1). Nonetheless, we found conflicting evidence in relation to gender and health risks. The latter might be due to differences in sample sizes between Study 1 and Study 2. Instrumental factors were relevant predictors of compliance with personal protective measures. In Studies 1 and 2, perceived risk was a significant predictor of compliance with all the personal protective measures (H2). A more robust measure of perceived risk, which distinguishes between risk for the self and risk for others, should be used to further understand whether risk is a relevant predictor of compliance with personal protective measures (see Murphy et al., 2020). In addition, in Study 2 there were significant effects of perceived legal enforcement: People who evaluated a high probability of being sanctioned for noncompliance were more likely to keep distance and wear a mask. In both studies, high perceived social norms predicted higher odds of complying (H3). The magnitude of the effect of social norms was as strong as the effect of living in areas under lockdown. This is in line with other research on how social norms predict compliance (Benneker et al., 2020). Against our expectations, perceived legitimacy of authorities did not predict compliance with any of the personal protective measures in Study 2. This finding is inconsistent with a large body of literature on legitimacy and compliance in general (e.g., Tyler, 2006) and in relation to the pandemic (Murphy et al., 2020). The latter might be because of a lack of trust in health authorities in Chile, presumably related to the unfair treatment and procedures that authorities have been implementing lately in the context of the Chilean social outbreak and the pandemic. Previous research in Chile has shown that legitimacy becomes a relevant predictor only among those who highly identify with the authority (Gerber et al., 2018). It might thus be the case that people identify only weakly with the health authorities determining regulations to control the pandemic in Chile, and perceived legitimacy is not relevant to explain compliance with those regulations. Another possible explanation for the lack of effect of legitimacy can be drawn from Tankebe’s (2009) research in Ghana. In a context where people have lost their faith in authorities to protect them, people might feel that they have to take control of their own lives. As argued by Tankebe, in this context, instrumental factors tend to be more relevant than normative factors. These findings highlight the need to replicate research with non-mainstream samples, and taking into account that the social context is crucial to better understand why people adhere to personal protective measures. In the current study—characterized by a population that lacks beliefs about the legitimacy of authorities—perceptions of legitimacy did also not predict compliance. However, the results were not only driven by instrumental factors. Indeed, one noticeable result was that in both studies social norms had stronger effects on compliance than instrumental concerns about being punished or getting infected with COVID-19. These findings suggest that authorities should not only rely on law enforcement to increase compliance. Promoting beliefs about compliance being the norm might have a stronger effect on compliance with personal protective measures.

Another important finding from our longitudinal data is that the percentage of people leaving home increases over time, even accounting for the implementation of mandatory lockdowns in certain areas. Briscese, Lacetera, Macis, and Tonin (2020) found that Italian participants were less likely to comply with protective measures when these were extended for longer periods of time than they expected. This of course has consequences for the way in which public and health authorities deal with people’s expectations when communicating extensions of the measures implemented. Our longitudinal data for this analysis was collected in an advanced phase of the COVID-19 pandemic, therefore being prone to a phenomena of compliance exhaustion from the population.
Limitations and Further Research

While our research provides an important contribution by presenting findings from a representative sample and a five-waves longitudinal study, some limitations should be mentioned. First, variables analyzed in both studies are single-item measures, and this may pose a threat to construct validity or low reliability. Further studies must develop more consistent measures that capture the constructs put forth in this article. Second, a self-selection bias is likely to occur in Study 1, in which people who are more concerned with COVID-19 are also more likely to respond to the different study waves. Third, we have considered different predictors, but there might, of course, be other relevant variables to consider when analyzing compliance with COVID-19 prevention efforts. Other studies may include multilevel variables, such as structural factors like the health system’s capacity to deal with increases in infection rates or other attitudinal and cognitive factors, such as conspiratorial thinking and fake news in the shaping of compliance behaviors. Further research might also consider measuring identification and/or trust with health authorities to help explain the lack of effect of perceived legitimacy on compliance.

Policy Recommendations

As long as the COVID-19 pandemic is not controlled, countries will have to adapt to living with COVID-19. In this context, many countries may need to continue implementing lockdowns to contain the spread of the disease, and policymakers should understand the factors that condition people to stay home and maximize the efficiency of these measures. The same is true for other personal protective measures such as washing hands, wearing masks, and keeping distance. To contain the virus, it is crucial that people follow these recommendations and regulations. The current studies draw on social-psychological research to propose avenues to promote people’s compliance with stay-at-home measures.

Results highlight once again the crucial role of social norms in shaping social reality. Perceived social norms are a relevant factor for people to adhere to protective measures. Interventions to build, maintain, and consolidate norms that enhance adherence to protective measures are therefore necessary, especially in a context in which authorities’ messages are not affecting individuals’ behaviors. It is important to note that promoting positive and undoubtedly desirable behaviors will not be effective if this behavior is not normative (Kawamura & Kusumi, 2020). Well-designed interventions should first consider whether changing social norms relates to changes in behaviors or beliefs (see Wallen & Romulo, 2017). It is also important that individuals perceive that social norms they are supposed to follow are carried out by similar people or those living in similar circumstances (Goldberg et al., 2020; Goldstein, Cialdini, & Griskevicius, 2008). Importantly, the success of social norms interventions depends on an initial group that begins to adopt the novel norm, and the perception that no one else will follow it might be an obstacle in this process. However, people’s perception that the rest of the group adheres to a norm can be affected even before transforming the current adherence to the norm (Tankard & Paluck, 2016), partly because individuals overgeneralize the behavior of role models to the general population (e.g., Paluck, Shepherd, & Aronow, 2016). Thus, role models can be used to generate a shift in perceived norms and increase the belief that a community approves and follows a certain behavior (Blair, Littman, & Paluck, 2019). Importantly, the role models should be significant and relevant actors for the community, given that social norms interventions are anchored on group processes and dynamics. This should also be combined with messages issued by identifying community influencers and influential leaders (World Health Organization, 2020) that serve as role models, changing the opinion of social referents and other group members’ beliefs (Prentice & Paluck, 2020). Further, we argue that compliance behaviors are dynamic and change across time.
Therefore, authorities must take this dynamic process in consideration when designing effective interventions.

The current research also reinforces the importance of enhancing risk-communication strategies by authorities to reduce infections. Risk communication is a cornerstone in the response to public health emergencies (Dickmann et al., 2016). Thus, authorities should undertake efforts to implement a risk-communication strategy ensuring that individuals and communities follow the necessary measures (World Health Organization, 2020). Importantly, in order to be effective, risk communication needs to meet certain criteria. First, given that risk perception is not merely cognitive, motivational and emotional factors should be also taken into account and authorities should pay attention to the emotional tone and logical vocabulary used, given that these aspects are relevant to persuade and encourage people to take action (Hilton, 2008). Second, numeracy and probability are not enough to understand risk, and authorities should spread qualitative and meaningful messages (Reyna, 2020), susceptible to being understood by the whole population. For instance, explaining how risk perceptions might influence our behavior might be more useful than transmitting the percentage of COVID-19 contagions. Third, following the WHO (2020) recommendations for COVID-19 risk-communication strategies, it is necessary to establish methods for reaching key audiences, targeting their knowledge and behavior. In light of our results, communication should target specifically young people and men.

Finally, policymakers should take into account the fact that both risk perception and social norms are affected by intragroup processes and take place in a given context (Prentice & Paluck, 2020). The implementation of interventions that do not consider the idiosyncrasy of the target groups and their socioeconomic conditions will not be successful and might perpetuate social inequality (see Templeton et al., 2020). In this line, we highlight that lockdown compliance and adherence to personal protective measures is partly shaped by sociodemographic and economic factors. In a country such as Chile, with high levels of inequality, access to health care and possibilities to stay at home during lockdown are highly stratified. If people who work and those with lower educational levels find it more difficult to comply, then interventions need to focus on providing means of subsistence outside of employment and securing jobs to make lockdown measures viable for everyone. To be successful, interventions need to be designed considering the realities of specific countries and the living conditions of specific groups of people.

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