
Physical Distancing Behavior: The Role of Emotions, Personality, Motivations, and Moral Decision-Making

Fabio Alivernini,¹ PhD, Sara Manganelli,² PhD, Laura Girelli,³ PhD, Mauro Cozzolino,³ PhD, Fabio Lucidi¹ PhD, and Elisa Cavicchiolo,³ PhD

¹Department of Developmental & Social Psychology, Faculty of Medicine and Psychology, Sapienza University of Rome, ²National Institute for the Evaluation of the Education System (INVALSI), and ³Department of Human Philosophical and Educational Sciences, University of Salerno

All correspondence concerning this article should be addressed to Elisa Cavicchiolo, PhD, Department of Human, Philosophical, and Educational Sciences, University of Salerno, Via Giovanni Paolo II, 132 - 84084 Fisciano (SA), Italy. E-mail: ecavicchiolo@unisa.it

Received 5 August 2020; revisions received 21 November 2020; accepted 22 November 2020

Abstract

Objective Physical distancing behavior (PDB) is a key disease prevention strategy for limiting the spread of COVID-19. In order to effectively encourage it among adolescents, it is necessary to understand the associated mental mechanisms. Health behavior theories suggest that emotions, personality, motivation, and moral disengagement could all play a role. On the basis of a longitudinal study, we investigated the importance of these factors in predicting PDB. **Methods** The participants were 347 adolescents residing in Italy. Data were collected in four waves starting from 1 year before the pandemic. A structural equation model based on health behavior theory was tested. **Results** After the COVID-19 national lockdown, adolescents experienced fewer positive emotions and more negative emotions compared with 1 year earlier. Nevertheless, these emotional changes, and adolescents' personality (except for openness to experiences), were not related to the adoption of PDB. Instead, the autonomous motivation of adolescents significantly predicted a higher likelihood to adopt PDB by increasing the intention to engage in this behavior and, more indirectly, by substantially decreasing moral disengagement, which was negatively related to PDB. In contrast, controlled motivation corresponded to significantly higher levels of moral disengagement and predicted less likelihood of adopting PDB. **Conclusions** Messages and interventions targeted at adolescents should be oriented towards supporting autonomy, emphasizing the personal and social value of PDB. Communications should avoid the use of coercive strategies based on eliciting emotions such as shame and guilt in adolescents who do not adopt PDB, which appear to trigger off mechanisms of moral disengagement.

Key words: health promotion and prevention; longitudinal research; mental health; psychosocial functioning.

Introduction

Adolescents appear to be less at risk than adults of experiencing the most severe symptoms of COVID-19 (COroNaVirus Disease 19; Kolifarhood et al., 2020), although in an increasing number of cases they require

hospitalization and intensive care (Sanna et al., 2020; World Health Organization, 2020). In addition, recent reports from Europe, North America, Asia, and Latin America refer to children and adolescents who suffer from multisystem inflammatory conditions associated

with COVID-19, which seem to have developed subsequent to infection rather than during the acute stage of the disease (Jiang et al., 2020). Importantly, there is also evidence that children and adolescents can very efficiently transmit SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus 2), the virus responsible for COVID-19 (Schwartz et al., 2020).

Adolescents' perceptions of a low level of threat, together with the fact that adolescence is a developmental period when peer social interactions are extremely significant (Alivernini et al., 2019; Smetana et al., 2006), probably explains why they can be reluctant to adopt the physical distancing behavior (PDB) that is a key health-prevention strategy against COVID-19 (Abbott et al., 2020). Consequently, it is necessary to identify the contents and modalities of targeted messages and interventions for encouraging adolescents that are most effective for limiting the spread of the virus (Abbott et al., 2020; Efuribe et al., 2020). General findings in the literature regarding prevention indicate that adolescents tend to pay more attention to the immediate rewards and pleasures of engaging in a behavior rather than its long-term consequences. It therefore seems logical that messages targeted at them should emphasize the short-term rather than the long-term effects of the behaviors (Latimer et al., 2012). There is also evidence that the more relevant and credible such messages are, the more efficacious they will be (Johnson & Eagly, 1989) and that perceived relevance and credibility are related to the source and the content of the message (Latimer et al., 2012; Shadel et al., 2009).

Maintaining one's physical distance from others is a very complex health behavior and, according to the literature on proxemics, a large number of factors ranging from trait level individual differences to normative thinking, might influence the way in which space is perceived and used in human interactions (Danesi, 2006; Haddad et al., 2019; Takayama & Pantofaru, 2009). More specifically, in the literature on preventive behaviors regarding COVID-19, it has been proposed that emotions (Oosterhoff et al., 2020; Sharma et al., 2020), personality (West et al., 2020), motivations (West et al., 2020), and moral decision-making (Bavel et al., 2020), might all play a role in explaining the adoption of social distancing measures during the COVID-19 crisis. Recent health behavior-change models highlight the importance of analyzing the interconnections between these factors in order to reduce the risk of COVID-19 transmission (Bavel et al., 2020; West et al., 2020). Accordingly, this longitudinal study investigated the interplay between emotions, personality, motivations and moral decision-making in predicting adolescents' PDB during the period subsequent to the national lockdown in Italy, which was

the first western country to be seriously affected by the COVID-19 pandemic.

Emotions and PDB

Adolescence is a period of life with various emotional challenges and during this period there is a considerable development of the individual's capacities of emotional regulation (Young et al., 2019). The experience of positive and negative emotions is closely related to many aspects of adolescent's psychological and physical well-being (Lord et al., 2015; Shen et al., 2018). Stressful life events, like a pandemic, can have a large impact on adolescents' positive and negative emotions, raising their levels of anxiety and psychological distress (Coates & Messman-Moore, 2014; Stevens et al., 2013). In this regard, a recent study has hypothesized that anxiety could make adolescents more focused on their personal health and therefore more engaged in PDB (Oosterhoff et al., 2020). From the perspective of interventions, it is important to know if an emotional change connected to the pandemic might be able to predict the adoption of PDB, since this would suggest that health-prevention campaigns focused on increasing adolescents' perception of threats as regards COVID-19 might be successful.

Personality and PDB

Previous research has demonstrated that health communication campaigns and intervention targeting specific subtypes of adolescents' personality can be effective in changing behavior, for example messages high in "sensation value" can capture the attention of sensation seekers and potentially persuade more these individuals to engage in health-behaviors (Stephenson & Palmgreen, 2001; Noar et al., 2006).

According to the Big Five personality traits model (McCrae & Costa, 2008), adolescents have various different ways of thinking, emotional reactions and behavior patterns that can be effectively described by referring to five broad dimensions of personality. These are: (a) extraversion (being oriented towards social stimuli); (b) agreeableness (being helpful and empathetic); (c) conscientiousness (exercising self-discipline); (d) neuroticism (feeling anxious and threatened); (e) openness to experiences (being curious and attracted to risk). The possible role of personality in explaining PDB has been suggested in the literature (West et al., 2020) but is at yet unexplored. Studies conducted in other health-related behavioral contexts have shown that more conscientious individuals are more likely to engage in health-promoting behavior, such as eating in a healthy way, engaging in physical activity and getting enough sleep, while more extraverted individuals are more likely to smoke cigarettes and to consume alcohol (Magee et al., 2013; Raynor & Levine, 2009; Yañez et al., 2020). Based on these

findings, we might expect conscientious adolescents to have stronger intentions than extroverted adolescents to adopt physical distancing. If personality traits do in fact account for significant variations in adolescents' PDB, then targeted messages directed at them, as well as regulatory and enabling interventions, should take these individual differences into consideration in order to be effective.

Motivations and PDB

Self-Determination Theory (SDT) is one of the leading theories of human motivation and it has been widely applied to explain and predict health-related behaviors (Ryan & Deci, 2017). According to SDT there are two main typologies of motivation: controlled and autonomous. Controlled motivation is regulated by internal pressures such as the avoidance of guilt and shame, and external factors such as reward and punishment, while autonomous motivation entails a personal conviction of the intrinsic value of an activity (Ryan & Deci, 2020). Knowing which type of motivation is likely to be more effective in encouraging PDB among adolescents can improve the efficacy of messages and interventions by guiding the decision whether to utilize those that emphasize control (e.g., you should be ashamed not to adopt PDB) or those that concentrate on autonomy (e.g., adopting PDB is an important responsibility but it should be left to you). According to Oosterhoff et al. (2020), adolescents motivated by autonomous reasons may be more likely to engage in PDB, but there is a lack of empirical evidence to support this claim.

Moral Decision-Making and PDB

Given the possibility that one's social interactions during a pandemic may infect others, moral decision-making is an important variable in predicting prevention behavior (Bavel et al., 2020). In this regard, moral disengagement has been shown to mediate the effects of motivational variables, on ethically problematic outcomes (Hodge et al., 2013; Moore, 2015), such as adopting (or not adopting) PDB. According to social cognitive theory (Bandura, 2002), moral disengagement refers to mental mechanisms which facilitate engaging in unethical behavior without feeling distress. Examples of these mechanisms include euphemistic labeling (e.g., thinking that not adopting PDB is a way of exercising one's freedom of choice), distortion of consequences (e.g., minimizing the negative effects of not adopting PDB), and diffusion of responsibility (e.g., thinking that individuals who don't adopt PDB should not be blamed, since most other people don't adopt them either). Adolescents with high levels of moral disengagement would feel very little guilt or shame about ignoring PDB measures and would, therefore, see no need to change their behavior.

Previous studies conducted in the context of health and risk behaviors suggest that individuals with higher levels of moral disengagement might be less willing to adopt physical distancing measures (Girelli et al., 2020; Hodge et al., 2013).

The Role of the Intention to Engage in PDB

Intentions are self-instructions to perform specific behaviors, such as "I intend to engage in PDB," or to obtain determined outcomes (Triandis, 1980). Theories of health behavior change, including the theory of reasoned action (Fishbein, 1980), the theory of planned behavior (Ajzen, 1991), the model of interpersonal behavior (Triandis, 1980), and protection motivation theory (Rogers, 1983), converge on the idea that the most immediate predictor of behavior is the intention to perform it. Since intention can transform psychological states into guided bodily responses, it is seen a mediational mechanism which has to be postulated in order to explain how mental factors influence observable action (Ajzen & Fishbein, 1980), and the experimental data tends to support this view (Webb & Sheeran, 2006). Physical distancing, like all complex behaviors, requires a certain amount of planning, and it seems implausible that it could be automatically stimulated by psychological states, without the presence of a prior decision and intention to perform it (Davis et al., 1989). In the present research adolescents' emotions, personality, motivations, and moral disengagement were therefore considered to be indirectly related to PDB through their effect on intention to engage in this behavior.

This Study

The main purpose of this study was to evaluate the validity of various factors proposed in the literature as possible predictors of adolescents' PDB. The tested model in accordance with experimental data (Webb & Sheeran, 2006) and with numerous theories in social and health psychology (e.g., Ajzen, 1991; Floyd et al., 2000; Triandis 1980), posited intention to engage in PDB as the most proximal predictor of future behavior. Consistently with currently existing data (e.g., Hodge et al., 2013; Moore, 2015), motivation was also considered as indirectly related to intention through its effect on moral disengagement.

Personality and changes in the experience of positive and negative affect related to the pandemic were considered to have a direct influence on intention, in accordance with principles of health behavior change recently proposed in order to reduce the transmission of COVID-19 (West et al., 2020). This model was tested after establishing differences in adolescents' emotions after the national lockdown period compared with the same period 1 year earlier, which was a

preliminary objective of the study. On the basis of the literature presented in the introduction, we formulated the following hypotheses: (a) after the national lockdown, negative affect would increase, while positive affect would decrease, and these emotional changes would indirectly predict more PDB, by intensifying the intention to engage in it. (b) More conscientious adolescents would have stronger intentions to adopt PDB, leading them to practice it more, while extroverted adolescents would have weaker intentions, leading them to practice less PDB. (c) Adolescents motivated by autonomous reasons would have stronger intention and would therefore engage in more PDB. We expected autonomous motives to have an additional positive effect on intention and, indirectly, on PDB, through lowering moral disengagement.

Materials and Methods

Participants and Procedure

The participants in this study were adolescents from several different geographical areas of Italy who had participated in an online education project that had started about a year before the pandemic reached this country. This project was based on a longitudinal survey, administered once a year, investigating adolescents' well-being and study habits.

School classes in which teachers had joined the project voluntarily were selected to complete the longitudinal survey and all students ($N = 371$) were asked to fill in an online questionnaire on a voluntary basis, which ensured the anonymity of the participants by the use of an individually chosen password. The first data collection (T0) took place in April 2019 (about a year before the peak of the first wave of the pandemic in Italy) and 366 adolescents out of 371 (98.7%) eligible subjects for the study filled in the questionnaire. Due to the pandemic, the general objectives and timelines of this project were partially modified and from then on a modified version of the questionnaire was administered.

The data used for this study were based on this longitudinal survey and included four data collections (Supplementary [Appendix SA](#)). Positive and negative affect were measured twice in the same adolescents at an interval of about 1 year: at Time 0, about a year before the peak of the first wave of the pandemic in Italy, (April 2019; $N = 366$) and at Time 1 (May 2020; $N = 351$, 95.9% of the Time 0 sample) after that peak, when the national lockdown was over. In Italy a national lockdown was established on March 10, 2020 and it lasted until May 3, 2020. It involved a wide range of control and anti-infection strategies, including the closure of all schools, travel restrictions and the limitation or suspension of many occupational activities. In the national postlockdown phase

(starting on May 4, 2020), when most of the data of this study was collected (Times 1, 2, and 3), the emergency restrictions had been substantially relaxed and adolescents could move freely within the national borders. At the same time, a sustained national campaign for the application of preventive measures and hygienic procedures, focusing mainly on physical distancing, was promoted (e.g., maintaining a physical distance of at least 1 m from others, and avoiding handshakes, hugs, and kisses) and appeals were made to the sense of personal responsibility of Italian citizens.

The other variables were measured only once at two subsequent moments. At Time 2 (1 week after Time 1, in May 2020; $N = 350$, 95.6% of the Time 0 sample) intention to engage in PDB and moral disengagement were assessed, while at Time 3 (3 weeks after Time 2, in June 2020; $N = 347$, 94.8% of the T0 sample) PDB was measured. This decision was made so as not to submit an excessive number of questions to the participants. There was an urgent need to gather data on adolescents' PDB and, in the short term (about 1 month), we did not expect to find significant changes in the constructs considered.

Some adolescents could not be contacted in the subsequent waves and so the final sample for our study consisted of 347 adolescents ($M_{age} = 16.3$ years; $SD_{age} = 1.12$; min = 14 years; max = 19 years) with a slight prevalence of males (57.9%). About half the final sample of students came from geographical regions with an incidence of COVID-19 cases between 201 and 500 (per 100,000 inhabitants), while the other half had an incidence of cases between 101 and 200 (per 100,000 inhabitants; [National Institute of Health, 2020](#)). Although the sample used in our study was not representative of the Italian population of adolescents, the participants did not self-select to take part in the research.

The eligibility criteria for being included in the study were: (a) being from 10 to 19 years old (inclusive); (b) belonging to the classes enrolled in the online education study which began about a year before the pandemic reached Italy; (c) being able to speak and read Italian. The exclusion criteria were: (a) having a learning disability or cognitive impairment that would make the participant incapable of completing the study; (b) not providing written informed consent or the written permission of parents (in the case of minors).

The study protocol was adapted for digital platforms ([Stiles-Shields et al., 2020](#)) and was approved by the institutional review board at the *Sapienza* University of Rome. The participants were given a link to a letter explaining the study and asking them to provide their informed written consent. Those who were still minors were asked to show this letter to their

parents and obtain their written permission. All adolescents who provided informed written consent by selecting that they agree to participate in the research were then invited to fill the questionnaire. Participants who completed all the data collections were entered into a lottery draw, the first prize of which was a tablet.

Measures

Positive and Negative Affect

The 10-Item version of the PANAS-C (Positive and Negative Affect Schedule - Children; Ebesutani et al., 2012) was used to measure affect. The scale consisted of five items measuring positive affect (joyful, cheerful, happy, lively, and proud) and five items measuring negative affect (miserable, mad, afraid, scared, and sad), and it had previously been tested on Italian adolescents (Alivernini et al., 2020). Adolescents were asked to indicate how often they had experienced the feelings described in each item during the previous month using a 5-point scale ranging from 1 (*never*) to 5 (*very often*). Cronbach's α at T0 was .78 for positive affect and .79 for negative affect, whereas at T1 it was .84 for positive affect and .73 for negative affect.

Personality Traits

Personality traits were assessed using the Italian Ten-Item Personality Inventory (I-TIPI; Chiorri et al., 2015; Gosling et al., 2003). The respondents indicated how much they felt that a total of ten pairs of adjectives applied to them on a 5-point Likert-type scale, ranging from 1 (*disagree strongly*) to 5 (*agree strongly*). Each of the Big Five personality traits was assessed by two items: extraversion (e.g., "I see myself as extraverted, enthusiastic"), agreeableness (e.g., "I see myself as sympathetic, warm"), conscientiousness (e.g., "I see myself as dependable, self-disciplined"), neuroticism (e.g., "I see myself as anxious, easily upset") and openness to experiences (e.g., "I see myself as open to new experiences, complex"). The original TIPI generally had low-to-moderate Cronbach's alphas (Nunes et al., 2018), which is a typical finding in 2-item scales (Ziegler et al., 2014). In our study the I-TIPI had moderate Cronbach's alphas ($\alpha = .63$ for extraversion; $\alpha = .51$ for agreeableness; $\alpha = .63$ for conscientiousness; $\alpha = .58$ for neuroticism; $\alpha = .60$ for openness to experiences). Mean scores were calculated for each personality trait, with higher values indicating their greater prevalence.

Motivation to Engage in PDB

Two scales were used, each one measuring a type of motivation by means of three items: autonomous motivation (e.g. "I engage in PDB because I find it personally meaningful") and controlled motivation (e.g. "I engage in PDB because I would feel ashamed not

to"). The items were based on those used in previous studies (Soenens et al., 2009), also conducted in the Italian context (e.g. Alivernini et al., 2008) and the responses were recorded on a 5-point scale, ranging from 1 ("not true at all") to 5 ("completely true"). Cronbach's α was .83 (for autonomous motivation) and .73 (for controlled motivation).

Moral Disengagement

Moral disengagement was assessed by means of six items (e.g. "Compared with the harmful effects of other behaviors, not complying with measures of social and physical distancing is not so bad" or "It makes no sense to blame individuals who don't comply with social distancing measures, when also everyone else does not follow them"), each one referring to different moral disengagement mechanism (e.g., euphemistic labeling, distortion of consequences, diffusion of responsibility). The items were adapted from another study conducted on Italian young people (Girelli et al., 2020). Replies for each item were chosen from a 5-point scale ranging from 1 (*I do not agree at all*) to 5 (*I completely agree*). For all items, higher values corresponded to a greater prevalence of moral disengagement behaviors. Cronbach's α was .79.

Intention to Engage in PDB

Two items (Cronbach's $\alpha = .83$) adapted from a previous study conducted in Italy (Girelli et al., 2020) were used to assess adolescents' intention to adopt PDB over the following 3 weeks (e.g., "How strong is your intention to engage in PDBs in the next 3 weeks?"). Adolescents' responses were recorded on a 5-point scale ranging from 1 (*not at all strong/likely*) to 5 (*very strong/likely*).

Physical Distancing Behavior

Adolescents' engagement in PDB (Cronbach's $\alpha = .87$) was assessed by three items corresponding to: (a) practicing physical distancing from others of at least 1 m; (b) avoiding physical contact with other people (handshakes, hugs and kisses); (c) avoiding crowded public places as much as possible. As the original version of the scale was in Italian, it was not necessary to translate it. The respondents indicated how often they had engaged in these behaviors during the previous week on a 5-point scale ranging from 1 (*never*) to 5 (*almost always/always*).

Demographic Variables

The participants were asked to provide information on their age and gender. Gender was coded as 0/1, with 1 indicating males and 0 indicating females.

Data Analysis

The changes in levels of positive and negative affect before and after the national lockdown were examined by means of a paired t-test. A structural equation model (SEM) was tested, using the Robust Maximum Likelihood estimator, in order to empirically examine the direct and indirect relationships of the variables on the basis of our hypotheses. The structure of the latent variables included in this model (i.e., motivations, moral disengagement, intention to engage in PDB and PDB) was previously tested by means of confirmatory factor analyses. Since we were interested in examining the possible consequences of changes in the absolute levels of positive and negative affect before and after the national lockdown, these variables were included in the analysis as difference scores (a year before the COVID-19 pandemic at T0, and after the national lockdown at T1; T1–T0). According to our hypotheses, difference scores in positive and negative affect, personality traits and autonomous and controlled motivations were considered as exogenous variables, while moral disengagement, intention to PDB and PDB as endogenous variables. Adolescents' age and gender were also included as exogenous control variables. All the exogenous variables were allowed to be correlated. As regards testing mediators, the confidence intervals (CIs) for the hypothesized indirect effects were calculated using the Delta method (Mackinnon, 2008). The goodness of fit of the SEM was judged by conventional criteria, employing both the chi-square test statistic and the following fit indices: the Comparative Fit Index (CFI) and the Tucker–Lewis index (TLI), both of which should be higher than .90 in a good-fit model (Schreiber et al., 2006); the Root Mean Square Error of Approximation (RMSEA) and the Standardized Root Mean Square Residual (SRMR), which are expected to be lower than .08 in an acceptable fit (Hooper et al., 2008).

Only complete data were used in the analysis ($N = 347$, missing data 5.2% of the T0 sample). A set of ANOVA (Analysis of Variance) analysis run on the baseline data ensured that there was no significant difference in the study variables between the included participants and those who were excluded.

All the analyses were conducted with the statistical modeling program Mplus version 8.1 (Muthén & Muthén, 2017).

Results

The descriptive statistics for all the measures and the latent factor correlations for the variables included in the proposed model are presented in [Supplementary Appendices SB and SC](#), respectively.

When compared with the same period 1 year earlier, there was an increase in adolescents' levels of

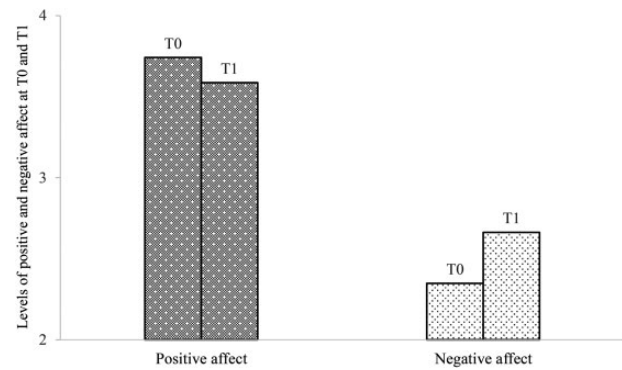


Figure 1. Changes in the levels of positive and negative affect after the national lockdown compared with the same period 1 year earlier.

Note. $N = 351$. Means were calculated about 1 year before COVID-19, in April 2019 (T0) and after the national lockdown, in May 2020 (T1). T0 is the baseline. All differences were statistically significant ($p < .001$).

negative affect following the national lockdown and a decrease in levels of positive affect (Figure 1).

As regards the measurement model of moral disengagement, the one-factor solution fitted the data reasonably well ($\chi^2 [9] = 28.26$, $p < .01$; CFI = 0.95; TLI = 0.92; RMSEA = 0.08; 90% CI = [0.047, 0.112]; SRMR = .04). All standardized factor loadings were statistically significant ($p < .001$) and ranged from .37 to .84.

The structural model including all the variables proved to have the following goodness of fit indexes: $\chi^2 (266) = 424.15$, $p < .00$; CFI = 0.94; TLI = 0.93; RMSEA = 0.04; 90% CI = [0.034, 0.049]; SRMR = 0.07. The standardized path coefficients for this model are shown in Figure 2, and the standardized path coefficients for indirect effects are shown in Table 1. Indirect effects were also tested, while controlling for the direct effect of positive and negative affect and personality traits on PDB, and the results remained unchanged.

The structural model results show that adolescents who felt that they were autonomously motivated were much less likely to consider themselves as morally justified in not engaging in PDB, while higher levels of controlled motivation were related to a greater degree of moral disengagement. Motivations accounted for 40% of variance in adolescents' moral disengagement. In turn, those participants who expressed more moral disengagement declared less intention to engage in PDB in the following 3 weeks. In addition to these indirect effects through moral disengagement, higher levels of autonomous motivation were related to a greater intention to engage in PDB, whereas no significant direct effects were detected for controlled motivation. Males and older adolescents tended to have less intention to engage in PDB. As regards personality traits, adolescents who were more open to experiences had less intention to engage in PDB, while no

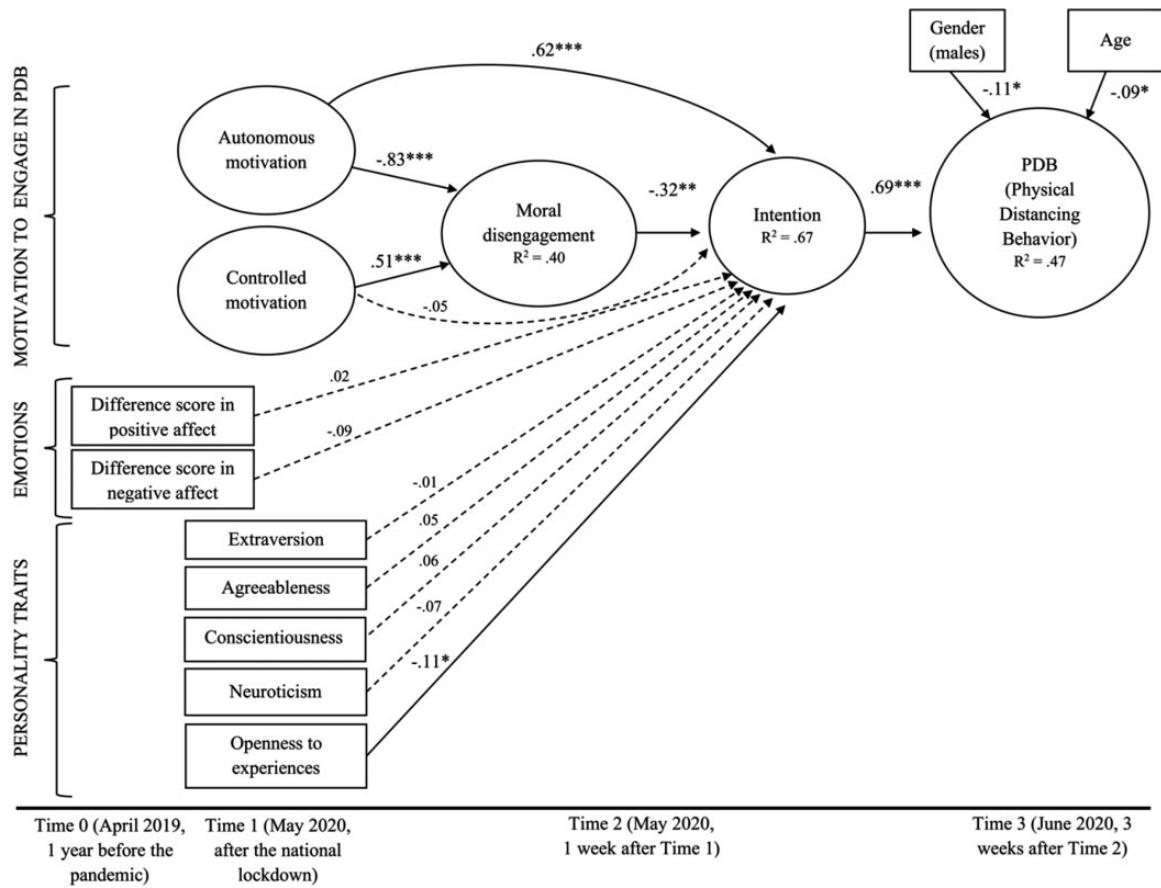


Figure 2. Standardized path coefficients for the tested model. *Note.* $N=347$. Dashed lines indicate paths that were not statistically significant ($p > .05$). $***p < .001$; $**p < .01$; $*p < .05$. All the exogenous variables were allowed to be correlated in the estimated model.

Table I. Standardized Path Coefficients for Mediated Effects of the Structural Equation Model for PDB

Paths	Mediator	Standard indirect effect	SE
Autonomous motivation → Intention	Moral disengagement	0.26**	.08
Controlled motivation → Intention	Moral disengagement	-0.16***	0.04
Autonomous motivation → PDB	Moral disengagement Intention	0.18**	0.06
Controlled motivation → PDB	Moral disengagement Intention	-0.11**	0.03
Extraversion → PDB	Intention	-0.01	0.04
Agreeableness → PDB	Intention	0.04	0.03
Conscientiousness → PDB	Intention	0.04	0.03
Neuroticism → PDB	Intention	-0.05	0.03
Openness to experiences → PDB	Intention	-0.08*	0.03
Positive affect → PDB	Intention	0.01	0.03
Negative affect → PDB	Intention	-0.06	0.04
Age → PDB	Intention	-0.06*	0.03
Gender (males) → PDB	Intention	-0.08*	0.03

Note. $N=347$. SE = standard error of the mean. $***p < .001$; $**p < .01$; $*p < .05$.

significant effects were detected for positive and negative affect. Intentions significantly predicted behavior 3 weeks later. Overall the model accounted for 67% of variance in intention and for 47% of variance in PDB.

An alternative model controlling for the effects of higher or lower levels of incidence of COVID-19 cases across the geographical areas considered in this study (dummy variable, 0 = lower levels, 1 = higher levels) was also tested. This model proved to have a poor fit ($\chi^2 [285] = 568.57, p < .00$; CFI = 0.89; TLI = 0.88; RMSEA = 0.05; 90% CI = [0.047, 0.060]; SRMR = 0.11). Higher levels of incidence of COVID-19 were weakly associated with more autonomous motivation ($\beta = .15, p < .01$), more intention to engage in PDB ($\beta = .10, p < .05$), and more PDB ($\beta = .09, p < .05$), while no significant associations were detected for controlled motivation and moral disengagement. In this poor-fitting model the results remained substantially unchanged.

Finally, we tested a model without the inclusion of intention to engage in PDB. Although this model was not in line with the theoretical framework of this study, it had a similar fit to the original model ($\chi^2 [220] = 336.09, p < .00$; CFI = 0.94; TLI = 0.94; RMSEA = 0.04; 90% CI = [0.030, 0.047]; SRMR = 0.06) and the significant paths as well as their directions remained unchanged.

Discussion

There is a lack of empirical evidence concerning psychological well-being outcomes in adolescents regarding COVID-19 (Sharma et al., 2020). This study compared adolescents' positive and negative emotions 1 year before the peak of the first wave of the pandemic (T0) and after the national lockdown (T1).

Our results show that even though the peak of the first wave of the pandemic was over at T1, the emergency measures had been substantially relaxed, and people were free to move again, adolescents experienced more negative affect and less positive affect compared with the same period 1 year earlier. Given the strong association during adolescence of positive and negative emotions with anxiety, depression and sleep quality (Coates & Messman-Moore, 2014; Shen et al., 2018; Stevens et al., 2013; Young et al., 2019), this result suggests an impact of the COVID-19 crisis on adolescents' mental health in the mid-term which deserves attention. To the best of our knowledge, this is the first study to provide longitudinal evidence on this issue.

The main purpose of this study was however to evaluate the importance of various factors proposed in the literature as possible predictors of adolescents' PDB. We tested a model, consistent with widely

adopted theories of health behavior change, which proved to fit the data well and accounted for a substantial amount of variance in adolescents' intentions and in behavior measured 3 weeks later.

As regards the above-mentioned changes in negative and positive emotions, our results suggest that they do not predict intention to engage in PDB. This evidence does not bear out the hypothesis put forward in a recent cross-sectional study that there might be a connection between anxiety levels and the adoption of PDB among adolescents (Oosterhoff et al., 2020). Our results are instead consistent with studies showing that the effects of emotions on the intention to engage in protective health behaviors can be nonsignificant when other motivational factors are taken into consideration (Nabi & Prestin, 2016).

It has also been supposed that personality factors might predict preventive behaviors against COVID-19 (West et al., 2020), but our findings indicate that the relationships between personality traits and PDB are statistically significant only for the trait of openness to experiences. As one might expect, adolescents who tend to be attracted by risk have less intention to adopt PDB. Nevertheless this relationship was still quite weak.

Previous studies indicate that moral disengagement can mediate the influence of motivational variables on ethical behavior such as PDB (Hodge et al., 2013; Moore, 2015). Our results are in line with this research, providing support for the hypothesis that moral decision-making plays an important role in the adoption of prevention behaviors during public health emergencies such as the COVID-19 crisis (Bavel et al., 2020). Adolescents with a higher level of moral disengagement are less likely to adopt PDB in the future, and this appears to be linked to their type of motivation.

In fact, both autonomous and controlled motivation have appeared to be the strongest predictors of adolescents' distancing behaviors, although they act in opposite ways. According to the results of the structural model, autonomous motivation leads to a higher likelihood of engaging in PDB in two ways: first, via its pathway to higher levels of intention and secondly by indirectly, but substantially, decreasing moral disengagement which has a negative relation to PDB. It has been suggested that autonomous motivation plays a positive role in various health behaviors (Gillison et al., 2019), including PDB (Oosterhoff et al., 2020), and this study provides empirical evidence suggesting that this kind of motivation effectively predicted adolescents' adoption of PDB 3 weeks later. In contrast, controlled motivation corresponds to significantly higher levels of moral disengagement, with reduced intention to engage in prevention behavior in future. We have therefore identified the potentially negative role

played by controlled motivation in the adoption of preventive behaviors by adolescents during the COVID-19 crisis. Our results suggest that, as it is often based on avoiding shame and guilt (Ryan & Deci, 2020), this type of motivation might actually fuel mental mechanisms of disengagement which have the function of reducing these negative emotions (Moore, 2015), thereby discouraging or preventing adolescents from engaging in PDB.

Limitations

Our findings should be interpreted while bearing in mind some limitations of the present study. First, even though we used a longitudinal design, taking into account many possible confounding factors suggested in the literature, it would be inadvisable to use the data to make strictly causal inferences. Second, although the adolescents in the study did not self-select to participate and they were from several different geographical areas of Italy, which was the first western country to be seriously affected by COVID-19, research in the field of PDB among adolescents will certainly benefit from future studies in various different cultural contexts. Third, this study relied on self-report measures which may be influenced by social desirability. We therefore repeatedly emphasized the anonymity of the current study to the participants, pointing out that they could respond freely, without the risk of criticism or prejudice.

In addition, our study was conducted starting immediately after the national lockdown and it was very difficult to collect data that were not based on self-reported responses, due to the limitations that had been imposed, as regards the obligation to maintain physical distancing, and the difficulty of having face-to-face meetings and of bringing participants together in the same place. Future studies might use technological devices, such as phone apps based on GPS tracking (Hagger et al., 2020) as different ways of measuring PDB, although similar approaches would need to comply with the privacy rights of the participants. Finally, consistently with the aims of our study, we measured adolescents' emotions over the period of a month. However, research based on daily diaries could provide further useful information about the variability of adolescents' emotions.

Conclusions

Despite the above-mentioned limitations, we believe that this study makes an innovative and effective contribution to the literature. It provides initial data regarding possible mental health outcomes among adolescents as regards COVID-19 in the mid-term related to a decrease in positive emotions and an increase in negative emotions. The study offers

longitudinal evidence on the several factors related to physical distancing among adolescents.

Personality and emotions do not appear to be among the more relevant variables, which would seem to be good news for health workers, since on the one hand individual differences in personality traits between adolescents are a very difficult variable to address in elaborating appropriate messages and effective interventions, and on the other hand, trying to persuade adolescents to adopt PDB by raising their anxiety levels might have negative consequences for their mental health. Instead, what appears to be particularly relevant is the interplay between the different types of motivation and the mechanisms involved in making moral decisions. Our results suggest that messages and regulatory or enabling interventions should be oriented towards supporting adolescents' autonomy, emphasizing the personal and social value of PDB, as well as pointing out that the decision of whether or not to adopt these behaviors is entirely up to them. In fact, autonomous motivation appears to increase the probability of PDB in future directly as well as indirectly, by promoting moral engagement. Targeted communications and interventions should therefore avoid the use of coercive strategies based on eliciting emotions such as shame and guilt in adolescents who do not adopt PDB, as these strategies could have the inverse effect of inhibiting preventive behaviors, because they are liable to trigger off mechanisms of moral disengagement.

Since several studies have shown the cross-cultural generalizability of the factors examined in the present research (e.g., Reeve et al., 2018 on motivation; Rolland, 2002 on personality traits; Karim et al., 2011; Vera-Villaruel et al., 2019 on emotions; Bandura et al., 1996; Girelli et al., 2020 on moral disengagement; Hassan et al., 2016 on behavioral intentions), our findings could provide useful indications for promoting PDB also among adolescents who live outside Italy.

Supplementary Data

Supplementary data can be found at: <https://academic.oup.com/jpepsy>.

Data Sharing and Declaration

The datasets analyzed during this study are not publicly available but are available from the corresponding author on reasonable request.

Ethics Declarations

Ethical Approval

All procedures performed in this study were in accordance with the ethical standards approved by the

institutional review board at the first and fifth authors' institution and with the 1964 Helsinki declaration and its later amendments.

Informed Consent

Written informed consent was obtained from schools and from all the participants (or their parents if minor) included in the study.

Authorship Criteria

All authors have seen the final draft of the manuscript, have approved of its submission to the Journal and be willing to take responsibility for it in its entirety. The article is not be submitted to more than one journal for simultaneous consideration.

Authors' Contribution

F.A. conceived of the study, participated in its design, coordination and in the interpretation of the data and drafted the article; E.C. conceived of the study, performed the statistical analyses, participated in the interpretation of the data and drafted the article; S.M. and L.G. participated in study design, data collection, and interpretation and helped to draft the article; M.C. and F.L. supervised the study design, contribute in the interpretation of data and critically revised the drafted article for important theoretical contents. All authors read and approved the final article.

Conflicts of interest: None declared.

References

- Abbott, A., Askelson, N., Scherer, A. M., & Affi, R. A. (2020). Critical reflections on COVID-19 communication efforts targeting adolescents and young adults. *Journal of Adolescent Health, 67*(2), 159–160. 10.1016/j.jadohealth.2020.05.013
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes, 50*(2), 179–211.
- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behavior*. Prentice Hall.
- Alivernini, F., Cavicchiolo, E., Manganelli, S., Chirico, A., & Lucidi, F. (2020). Students' psychological well-being and its multilevel relationship with immigrant background, gender, socioeconomic status, achievement, and class size. *School Effectiveness and School Improvement, 31*(2), 172–191.
- Alivernini, F., Cavicchiolo, E., Girelli, L., Lucidi, F., Biasi, V., Leone, L., Cozzolino, M., & Manganelli, S. (2019). Relationships between sociocultural factors (gender, immigrant and socioeconomic background), peer relatedness and positive affect in adolescents. *Journal of Adolescence, 76*(August), 99–108. 10.1016/j.adolescence.2019.08.011
- Alivernini, F., Lucidi, F., & Manganelli, S. (2008). Assessment of academic motivation: A mixed methods study. *International Journal of Multiple Research Approaches, 2*(1), 71–82. 10.5172/mra.455.2.1.71
- Bandura, A. (2002). Selective moral disengagement in the exercise of moral agency. *Journal of Moral Education, 31*(2), 101–119. 10.1080/0305724022014322
- Bandura, A., Barbaranelli, C., Caprara, G. V., & Pastorelli, C. (1996). Mechanisms of moral disengagement in the exercise of moral agency. *Journal of Personality and Social Psychology, 71*(2), 364–374.
- Bavel, J. J. V., Baicker, K., Boggio, P. S., Capraro, V., Cichocka, A., Cikara, M., Crockett, M. J., Crum, A. J., Douglas, K. M., Druckman, J. N., Drury, J., Dube, O., Ellemers, N., Finkel, E. J., Fowler, J. H., Gelfand, M., Han, S., Haslam, S. A., Jetten, J., ... Willer, R. (2020). Using social and behavioural science to support COVID-19 pandemic response. *Nature Human Behaviour, 4*(5), 460–471. 10.1038/s41562-020-0884-z
- Chiorri, C., Bracco, F., Piccinno, T., Modafferi, C., & Battini, V. (2015). Psychometric properties of a revised version of the Ten-Item Personality Inventory. *European Journal of Psychological Assessment, 31*(2), 109–119. 10.1027/1015-5759/a000215
- Coates, A. A., & Messman-Moore, T. L. (2014). A structural model of mechanisms predicting depressive symptoms in women following childhood psychological maltreatment. *Child Abuse & Neglect, 38*(1), 103–113. 10.1016/j.chiabu.2013.10.005
- Danesi, M. (2006). Proxemics. In K., Brown (Ed.), *Encyclopedia of Language & Linguistics* (2nd edn, pp. 241–243). Elsevier. 10.1016/B0-08-044854-2/01441-3
- Davis, F. D., Bagozzi, R. P., & Warshaw, P. R. (1989). User acceptance of computer technology: A comparison of two theoretical models. *Management Science, 35*(8), 982–1003. 10.1287/mnsc.35.8.98
- Ebesutani, C., Regan, J., Smith, A., Reise, S., Higa-McMillan, C., & Chorpita, B. F. (2012). The 10-item Positive and Negative Affect Schedule for children, child and parent shortened versions: Application of item response theory for more efficient assessment. *Journal of Psychopathology and Behavioral Assessment, 34*(2), 191–203. 10.1007/s10862-011-9273-2
- Efuribe, C., Barre-Hemingway, M., Vaghefi, E., & Suleiman, A. B. (2020). Coping with the COVID-19 crisis: A call for youth engagement and the inclusion of young people in matters that affect their lives. *The Journal of Adolescent Health, 67*(1), 16–17. 10.1016/j.jadohealth.2020.04.009
- Fishbein, M. (1980). A theory of reasoned action: Some applications and implications. In H. Howe, and M. Page (Eds.), *Nebraska Symposium on Motivation* (Vol. 27, pp. 65–116). University of Nebraska Press.
- Floyd, D. L., Prentice-Dunn, S., & Rogers, R. W. (2000). A meta-analysis of research on protection motivation theory. *Journal of Applied Social Psychology, 30*(2), 407–429. 10.1111/j.1559-1816.2000.tb02323.x
- Gillison, F. B., Rouse, P., Standage, M., Sebire, S. J., & Ryan, R. M. (2019). A meta-analysis of techniques to promote motivation for health behaviour change from a self-determination theory perspective. *Health Psychology Review, 13*(1), 110–130. 10.1080/17437199.2018.1534071

- Girelli, L., Cavicchiolo, E., Alivernini, F., Manganelli, S., Chirico, A., Galli, F., Cozzolino, M., & Lucidi, F. (2020). Doping use in high-school students: Measuring attitudes, self-efficacy, and moral disengagement across genders and countries. *Frontiers in Psychology, 11*, 663. 10.3389/fpsyg.2020.00663
- Gosling, S. D., Rentfrow, P. J., & Swann, W. B. (2003). A very brief measure of the Big-Five personality domains. *Journal of Research in Personality, 37*(6), 504–528. 10.1016/S0092-6566(03)00046-1
- Haddad, A., Doherty, R., & Purtilo, R. (2019). Respectful communication in an information age. *Health Professional and Patient Interaction, 141*–165. <https://doi.org/10.1016/b978-0-323-53362-1.00010-4>
- Hagger, M. S., Smith, S. R., Keech, J. J., Moyers, S. A., & Hamilton, K. (2020). Predicting social distancing intention and behavior during the COVID-19 pandemic: An integrated social cognition model. *Annals of Behavioral Medicine, 54*(10), 713–727. 10.1093/abm/kaa073
- Hassan, L. M., Shiu, E., & Parry, S. (2016). Addressing the cross-country applicability of the theory of planned behavior (TPB): A structured review of multi-country TPB studies. *Journal of Consumer Behaviour, 15*(1), 72–86.
- Hodge, K., Hargreaves, E. A., Gerrard, D., & Lonsdale, C. (2013). Psychological mechanisms underlying doping attitudes in sport: Motivation and moral disengagement. *Journal of Sport and Exercise Psychology, 35*(4), 419–432. 10.1123/jsep.35.4.419
- Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural Equation Modelling: Guidelines for Determining Model Fit. *Electronic Journal of Business Research Methods, 6*(1), 53–60. <https://doi.org/10.21427/D7CF7R>
- Jiang, L., Tang, K., Levin, M., Irfan, O., Morris, S. K., Wilson, K., Klein, J. D., & Bhutta, Z. A. (2020). COVID-19 and multisystem inflammatory syndrome in children and adolescents. *The Lancet Infectious Diseases, 20*(11), e276–e288. 10.1016/S1473-3099(20)30651-4
- Johnson, B. T., & Eagly, A. H. (1989). Effects of involvement on persuasion: A meta-analysis. *Psychological Bulletin, 106*(2), 290–314. 10.1037/0033-2909.106.2.290
- Karim, J., Weisz, R., & Rehman, S. U. (2011). International positive and negative affect schedule short-form (I-PANAS-SF): Testing for factorial invariance across cultures. *Procedia - Social and Behavioral Sciences, 15*, 2016–2022.
- Kolifarhood, G., Aghaali, M., Mozafar Saadati, H., Taherpour, N., Rahimi, S., Izadi, N., & Hashemi Nazari, S. S. (2020). Epidemiological and clinical aspects of COVID-19; A narrative review. *Archives of Academic Emergency Medicine, 8*(1), e41.
- Latimer, A. E., Krishnan-Sarin, S., Cavallo, D. A., Duhig, A., Salovey, P., & O'Malley, S. A. (2012). Targeted smoking cessation messages for adolescents. *Journal of Adolescent Health, 50*(1), 47–53. 10.1016/j.jadohealth.2011.04.013
- Lord, J. H., Rumburg, T. M., & Jaser, S. S. (2015). Staying positive: Positive affect as a predictor of resilience in adolescents with type 1 diabetes. *Journal of Pediatric Psychology, 40*(9), 968–977. 10.1093/jpepsy/jsv042
- Mackinnon, D. (2008). *Introduction to Statistical Mediation Analysis*. Erlbaum and Taylor Francis Group.
- Magee, C. A., Heaven, P. C. L., & Miller, L. M. (2013). Personality change predicts self-reported mental and physical health. *Journal of Personality, 81*(3), 324–334. 10.1111/j.1467-6494.2012.00802.x
- McCrae, R. R., & Costa, P. T. Jr. (2008). The five-factor theory of personality. In O. P. John, R. W. Robins, and L. A. Pervin (Eds.), *Handbook of Personality: Theory and Research*. (3rd edn, pp. 159–181). The Guilford Press.
- Moore, C. (2015). Moral disengagement. *Current Opinion in Psychology, 6*, 199–204. 10.1016/j.copsyc.2015.07.018.
- Muthén, L. K., & Muthén, B. O. (2017). *Mplus: Statistical analysis with latent variables: User's guide (Version 8)*. Muthén & Muthén.
- Nabi, R. L., & Prestin, A. (2016). Unrealistic hope and unnecessary fear: Exploring how sensationalistic news stories influence health behavior motivation. *Health Communication, 31*(9), 1115–1126. 10.1080/10410236.2015.1045237
- National Institute of Health. (2020). *Epidemia COVID-19, aggiornamento nazionale, 26 maggio 2020, [COVID-19 Pandemic, National update, May, 26, 2020]*. National Institute of Health.
- Noar, S. M., Zimmerman, R. S., Palmgreen, P., Lustria, M., & Horosewski, M. L. (2006). Integrating personality and psychosocial theoretical approaches to understanding safer sexual behavior: Implications for message design. *Health Communication, 19*(2), 165–174. 10.1207/s15327027hc1902_8
- Nunes, A., Limpo, T., Lima, C. F., & Castro, S. L. (2018). Short scales for the assessment of personality traits: Development and validation of the Portuguese Ten-Item Personality Inventory (TIPI). *Frontiers in Psychology, 9*, 461. 10.3389/fpsyg.2018.00461
- Oosterhoff, B., Palmer, C. A., Wilson, J., & Shook, N. (2020). Adolescents' Motivations to Engage in Social Distancing During the COVID-19 Pandemic: Associations With Mental and Social Health. *Journal of Adolescent Health, 67*(2), 179–185. 10.1016/j.jadohealth.2020.05.004
- Raynor, D. A., & Levine, H. (2009). Associations between the five-factor model of personality and health behaviors among college students. *Journal of American College Health, 58*(1), 73–81. 10.3200/JACH.58.1.73-82
- Reeve, J., Ryan, R. M., & Deci, E. L. (2018). Sociocultural influences on student motivation as viewed through the lens of self-determination theory. In G. A. D. Liem, and D. M. McInerney (Eds.), *Big theories revisited 2* (pp. 15–40). Information Age.
- Rogers, R. W. (1983). Cognitive and physiological processes in fear appeals and attitude change: A revised theory of protection motivation. In J. T. Cacioppo and R. E. Petty (Eds.), *Social psychophysiology: A sourcebook*. Guilford Press.
- Rolland, J. P. (2002). Cross-cultural generalizability of the Five-Factor Model of personality. In R.R. McCrae and J. Allik. (Eds.), *The Five-Factor Model of personality across cultures*. (pp. 7–28). Kluwer Academic/Plenum Publishers.
- Ryan, R. M., & Deci, E. L. (2017). *Self-determination theory: Basic psychological needs in motivation, development, and wellness*. Guilford Press.

- Ryan, R. M., & Deci, E. L. (2020). Intrinsic and extrinsic motivation from a self-determination theory perspective: Definitions, theory, practices, and future directions. *Contemporary Educational Psychology*, *61*, 101860. <https://doi.org/10.1016/j.cedpsych.2020.101860>
- Sanna, G., Serrau, G., Bassareo, P. P., Neroni, P., Fanos, V., & Marcialis, M. A. (2020). Children's heart and COVID-19: Up-to-date evidence in the form of a systematic review. *European Journal of Pediatrics*, *179*(7), 1079–1087. [10.1007/s00431-020-03699-0](https://doi.org/10.1007/s00431-020-03699-0)
- Schreiber, J. B., Stage, F. K., King, J., Nora, A., & Barlow, E. A. (2006). Reporting structural equation modeling and confirmatory factor analysis results: A review. *The Journal of Educational Research*, *99*(6), 323–338. <https://doi.org/10.3200/JOER.99.6.323-338>
- Schwartz, N. G., Moorman, A. C., Makaretz, A., Chang, K. T., Chu, V. T., Szablewski, C. M., Yousaf, A. R., Brown, M. M., Clyne, A., DellaGrotta, A., Drobeniuc, J., Korpics, J., Muir, A., Drenzek, C., Bandy, U., Kirking, H. L., Tate, J. E., Hall, A. J., Lanzieri, T. M., & Stewart, R. J. (2020). Adolescent with COVID-19 as the source of an outbreak at a 3-week family gathering—Four states, June–July 2020. *MMWR: Morbidity and Mortality Weekly Report*, *69*(40), 1457–1459. [10.15585/mmwr.mm6940e2](https://doi.org/10.15585/mmwr.mm6940e2)
- Shadel, W. G., Fryer, C. S., & Tharp-Taylor, S. (2009). Uncovering the most effective active ingredients of anti-smoking public service announcements: The role of actor and message characteristics. *Nicotine & Tobacco Research*, *11*(5), 547–552. [10.1093/ntr/ntp045](https://doi.org/10.1093/ntr/ntp045)
- Sharma, V., Reina Ortiz, M., & Sharma, N. (2020). Risk and protective factors for adolescent and young adult mental health within the context of COVID-19: A perspective from Nepal. *Journal of Adolescent Health*, *67*(1), 135–137. [10.1016/j.jadohealth.2020.04.006](https://doi.org/10.1016/j.jadohealth.2020.04.006)
- Shen, L., Schie, J., Ditchburn, G., Brook, L., & Bei, B. (2018). Positive and negative emotions: Differential associations with sleep duration and quality in adolescents. *Journal of Youth and Adolescence*, *47*(12), 2584–2512. [10.1007/s10964-018-0899-1](https://doi.org/10.1007/s10964-018-0899-1)
- Smetana, J. G., Campione-Barr, N., & Metzger, A. (2006). Adolescent development in interpersonal and societal contexts. *Annual Review of Psychology*, *57*(1), 255–284. [10.1146/annurev.psych.57.102904.190124](https://doi.org/10.1146/annurev.psych.57.102904.190124)
- Soenens, B., Vansteenkiste, M., & Niemiec, C. P. (2009). Should parental prohibition of adolescents' peer relationships be prohibited? *Personal Relationships*, *16*(4), 507–530. [10.1111/j.1475-6811.2009.01237.x](https://doi.org/10.1111/j.1475-6811.2009.01237.x)
- Stephenson, M. T., & Palmgreen, P. (2001). Sensation seeking, perceived message sensation value, personal involvement, and processing of anti-marijuana PSAs. *Communication Monographs*, *68*(1), 49–71.
- Stevens, N. R., Gerhart, J., Goldsmith, R. E., Heath, N. M., Chesney, S. A., & Hobfoll, S. E. (2013). Emotion regulation difficulties, low social support, and interpersonal violence mediate the link between childhood abuse and posttraumatic stress symptoms. *Behavior Therapy*, *44*(1), 152–161. [10.1016/j.beth.2012.09.003](https://doi.org/10.1016/j.beth.2012.09.003)
- Stiles-Shields, C., Plevinsky, J. M., Psihogios, A.M.6., & Holmbeck, G. N. (2020). Considerations and future directions for conducting clinical research with pediatric populations during the COVID-19 pandemic. *Journal of Pediatric Psychology*, *45*(7), 720–724. [10.1093/jpepsy/jsaa055](https://doi.org/10.1093/jpepsy/jsaa055)
- Takayama, L., & Pantofaru, C. (2009). Influences on proxemic behaviors in human-robot interaction. In IEEE/RSJ International Conference on Intelligent Robots and Systems, *St. Louis, MO*, pp. 5495–5502. [10.1109/IROS.2009.5354145](https://doi.org/10.1109/IROS.2009.5354145)
- Triandis, H. C. (1980). Values, attitudes, and interpersonal behavior. In H. E. Howe Jr., and M. Page (Eds.), *Nebraska symposium of motivation*. (Vol. 27, pp. 195–259). University of Nebraska Press.
- Vera-Villaruel, P., Urzúa, A., Jaime, D., Contreras, D., Zych, I., Celis-Atenas, K., Silva, J. R., & Lillo, S. (2019). Positive and Negative Affect Schedule (PANAS): Psychometric properties and discriminative capacity in several Chilean samples. *Evaluation & the Health Professions*, *42*(4), 473–497.
- Webb, T. L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin*, *132*(2), 249–268. [10.1037/0033-2909.132.2.249](https://doi.org/10.1037/0033-2909.132.2.249)
- West, R., Michie, S., Rubin, G. J., & Amlôt, R. (2020). Applying principles of behaviour change to reduce SARS-CoV-2 transmission. *Nature Human Behaviour*, *4*(5), 451–459. [10.1038/s41562-020-0887-9](https://doi.org/10.1038/s41562-020-0887-9)
- World Health Organization. (2020). Multisystem inflammatory syndrome in children and adolescents with COVID-19. <https://www.who.int/publications/i/item/multisystem-inflammatory-syndrome-in-children-and-adolescents-with-covid-19>. 1–3 May.
- Yañez, A. M., Bennisar-Veny, M., Leiva, A., & García-Toro, M. (2020). Implications of personality and parental education on healthy lifestyles among adolescents. *Scientific Reports*, *10*(1), 1–10. [10.1038/s41598-020-64850-3](https://doi.org/10.1038/s41598-020-64850-3)
- Young, K. S., Sandman, C. F., & Craske, M. G. (2019). Positive and negative emotion regulation in adolescence: Links to anxiety and depression. *Brain Sciences*, *9*(4), 76. [10.3390/brainsci9040076](https://doi.org/10.3390/brainsci9040076)
- Ziegler, M., Kemper, C. J., & Krueger, P. (2014). Short scales – Five misunderstandings and ways to overcome them [Editorial]. *Journal of Individual Differences*, *35*(4), 185–189. [10.1027/1614-0001/a000148](https://doi.org/10.1027/1614-0001/a000148)