

Constructive Optimism, Defensive Optimism, and Gender as Predictors of Autonomous Motivation to Follow Stay-at-Home Recommendations During the COVID-19 Pandemic

Tamara O. Gordeeva^{a, d}, Oleg A. Sychev^{b*}, Yuri I. Semenov^c

^a Faculty of Psychology, Lomonosov Moscow State University, Moscow, Russia

^b Altai State University for Humanities, Biysk, Russia

^c Academy of Sciences of the Republic of Sakha, Yakutia, Yakutsk, Russia

^d Higher School of Economics, Moscow, Russia

* Corresponding author. E-mail: osn1@mail.ru

Background. This study is based on self-determination theory and the research on dispositional optimism and unrealistic optimism. Dispositional optimism is known to be protective of well-being and is related to adaptive coping strategies. Investigations related to unrealistic optimism, on the other hand, revealed that it may have both positive and negative consequences.

Objective. To investigate dispositional optimism and two kinds of specific optimism as predictors of autonomous motivation to follow stay-at-home orders during the COVID-19 pandemic in a sample of Russian young adults: constructive optimism, meaning belief in the role of effort; and defensive optimism, meaning unrealistic expectations and denial that a problem exists.

Design. A correlational (cross-sectional) study was conducted to measure adherence to the recommendation to stay at home, autonomous motivation, dispositional optimism, constructive optimism, and defensive optimism. An online survey was completed by 1,403 young adults (68% women) during the first month of lockdown.

Results. The findings demonstrate that constructive optimism and its underlying dispositional optimism predict both autonomous motivation and adherence to the recommendation to stay at home, while defensive optimism produces the opposite, undermining effects. Structural equation modeling revealed the effect of gender on adherence to the recommendation (higher in women), mediated by different types of optimism and autonomous motivation.

Conclusion. Dispositional optimism together with situation-specific constructive and defensive types of optimism are essential for explaining the health-related behavior and its motivation. These results contribute to self-determination theory, considering the role of personality factors in determining motivation.

Keywords: COVID-19 pandemic, constructive optimism, defensive optimism, dispositional optimism, autonomous motivation, stay-at-home orders, gender, well-being

Introduction

The coronavirus outbreak that started in December 2019 has caused significant disruptions to people's lives around the world. The seriousness of the risk, unpredictability of the situation, and uncertainty about how to control the disease make the situation especially stressful. The COVID-19 pandemic has led many countries to implement lockdowns. While lockdowns help to contain the spread of the virus, research in many countries shows that they also result in substantial damage to well-being and mental health (Agteren et al., 2020; Ahmed et al., 2020; Balkhi, Nasir, Zehra, & Riaz, 2020; Brodeur, Clark, Fleche, & Powdthavee, 2020; Brooks et al., 2020; Bu, Hanspal, Liao, & Liu, 2020; Globig, Blain, & Sharot, 2020; Huang & Zhao, 2020; Lei et al., 2020; Pervichko, Mitina, Stepanova, Koniukhovskaia, & Dorokhov, 2020; Solomou & Constantinidou, 2020; Stanton et al., 2020; Wang et al., 2020). For example, findings from researchers in China, the country which faced the COVID-19 first, have shown a prevalence of depression during quarantine up to 37% (Ahmed et al., 2020), and a prevalence of anxiety up to 35% (Huang & Zhao, 2020). In particular, a comparison study found significant differences in the prevalence of depression and anxiety between people in quarantine and people not in quarantine (Lei et al., 2020). Similarly, a recent Australian study (Agteren et al., 2020) demonstrated significantly worse outcomes on all mental health measures for participants measured during COVID-19, compared to those measured before ($p \leq .001$ for all outcomes, effect sizes ranging between $d = .32$ to $d = .81$). Research on Google Trends in Europe and the US (Brodeur et al., 2020) found a substantial increase in the search intensity for boredom, loneliness, worry, and sadness. Most research shows increase in anxiety, depression, and sleep disturbance. The reported increase in mental health issues due to physical distancing, quarantine, and social isolation makes further research in this area critical in order to identify groups at risk and to tailor appropriate interventions.

While most results suggest that people's mental health may have been severely affected by the lockdown and social control mechanisms, there are also some promising findings regarding quarantine's effects on mental health. First, not everyone experienced significant deterioration in mental health, including stress, anxiety, depression, and loneliness. Second, it seems that psychological well-being was only partly affected by the pandemic and lockdown. For example, studying a Russian sample, Rasskazova and colleagues (2020) have shown that life satisfaction and positive and negative emotions remained stable during the spring 2020 pandemic compared to previous years. Third, it seems that most people have adapted to the quarantine. Globig, Blain, and Sharot (2020) found that anxiety was significantly lower one month into lockdown relative to the beginning of lockdown, and people reported an increase in their sense of agency; optimism and happiness remained stable.

The only study on psychological predictors of positive behavior change (e.g., social distancing, improved hand hygiene) during the COVID-19 pandemic showed the role of fear of the virus in public health compliance (Harper, Satchell, Fido, & Latzman, 2020). It is unclear whether positive attitudes and beliefs matter.

Psychological and Demographic Factors Related to Stress and Declining Mental Health During the Pandemic

Psychological Factors

It is possible that the effects of lockdown are mediated by people's perception of the severity of the situation and specific cognitive strategies and personality variables, such as optimistic expectations and resilience. Optimism, hope, and self-efficacy are three cognitive variables representing positive expectations that proved to protect against development of PTSD (Gallagher, Long, & Phillips, 2020) and which may be helpful in overcoming psychological consequences of COVID-19-related stress. We found two studies which examined different types of optimism in the context of COVID-19-related stress and well-being (Arslan & Yildirim, 2020; Globig et al., 2020).

Globig, Blain & Sharot (2020) discovered that optimism regarding the COVID-19 pandemic was associated with people's positive feelings and this association was mediated by people's sense of agency over their future. Arslan and Yildirim's study (2020) indicated that optimistic cognitions and psychological inflexibility mediated the effect of coronavirus stress on psychological problems. However, we found no research on the role of constructive and inflexible optimism ("rose-colored glasses") and its role in well-being during the pandemic.

Gender and Other Demographic Factors

Most studies show the effect of gender (female), age (Solomou & Constantinidou, 2020), health problems (de Pedraza, Guzi, & Tijdens, 2020), and low income (Bu et al., 2020) on well-being during the COVID-19 pandemic. Studies on different samples have shown that women are especially vulnerable to COVID-related anxiety and depression (Adams-Prassl, Boneva, Golin, & Rauh, 2020; de Pedraza et al., 2020; Pervichko et al., 2020; Rasskazova, Leontiev, & Lebedeva, 2020; Solomou & Constantinidou, 2020; Stanton et al., 2020; Wang et al., 2020). This may be related to less tolerance of stress and less productive coping strategies during the COVID-19 pandemic displayed by women. Indeed, Rasskazova and colleagues (2020) have shown that women were less prone to use active coping strategies and humor during the pandemic; these strategies were related to higher well-being and better mental health.

Optimism, Well-Being, and Health-Related Outcomes

Our research is concentrated on different types of optimism as factors that promote adherence to the recommendation to stay at home during the self-isolation (quarantine) period, which was intended to protect health-related outcomes. Optimism represents trait-like positive expectancies conceptualized in the context of goal-directed behavior. Scheier and Carver (1985) define *dispositional optimism* as a personality trait representing the tendency to anticipate favorable outcomes to events. It is an important predictor of well-being and life satisfaction, and is associated with lower levels of anxiety and depression (Andersson, 1996; Carver & Scheier, 2014) and better physical health and longevity (Carver, Scheier, & Segerstrom, 2010; Taylor, Kemeny, Reed, Bower, & Gruenewald, 2000). Optimism en-

hances people's motivation to pursue goal-oriented behaviors (Scheier & Carver, 1985) and is related to better subjective well-being in times of adversity (Carver et al., 2010).

Optimistic individuals have been reported to employ more *approach coping strategies* aiming to reduce, eliminate, or manage stressors or emotions, and fewer *avoidance coping strategies* seeking to avoid, ignore, or withdraw from stressors or emotions (Nes & Segerstrom, 2006). A recent meta-analysis shows that positive expectancies may protect against the development of posttraumatic stress disorder (PTSD) (Gallagher et al., 2020). Thus, dispositional optimism acts as a motivational mechanism important to mobilize cognitive and affective resources associated with well-being.

Since people are prone to be optimistic about life events, especially those happening in their own lives (Seligman, 2011; Sharot, 2012), they can sometimes rely on optimism too much. For example, some people “wear rose-colored glasses” and display unrealistic optimism. Goleman (1989) considers the individual's optimistic capacity for self-deception as a survival mechanism, which plays a vital role in the psyche of the healthy person. The function of denial is to soothe, maintain illusions, and promote well-being. Although positive illusions and expectations are prevalent in normal life and are often considered useful in some cases for maintaining a healthy mental state (Taylor et al., 2000), there is serious disagreement about whether they are beneficial or not. Colvin and Block (1994) conclude that it remains unproven whether unrealistic optimism, unrealistically positive views of the self, and illusions of control — three key positive illusions — foster mental health. Despite some new data showing that positive illusions, including self-enhancement and favorable comparisons with others, are related to high subjective well-being and low depressiveness (Dufner, Gebauer, Sedikides, & Denissen, 2019), we did not find strong empirical support for the health benefits of unrealistically positive expectations about the life-threatening events that are the object of our study.

Specific Types of Optimism: Constructive and Defensive Optimism

Dispositional optimism refers to stable personality characteristics that have important implications for regulating one's behaviors and maintaining well-being. Research suggests that specific types of optimism may be better predictors of COVID-19-related mental health outcomes (Globig et al., 2020) and behavior in stressful situation (Gassman, 2019) than is dispositional optimism. Gallaher et al.'s meta-analysis (2020) of positive expectations revealed that generalized self-efficacy has a weaker relationship with PTSD than specific self-efficacy. In the present research, we distinguish two specific types of optimism related to perception of threatening life events (the COVID-19 pandemic) — constructive optimism and defensive optimism.

Defensive optimism is a tendency to believe that the situation is not as bad as others (realistically) present it. Defensive optimism is similar to minimization, which is considered a type of cognitive distortion in cognitive-behavioral therapy; it is the opposite of exaggeration (Helmond, Overbeek, Brugman, & Gibbs, 2015). Minimization, or downplaying the significance of an event or emotion, is a com-

mon strategy for dealing with negative feelings such as guilt (Hoyk & Hersey, 2010). Defensive optimism is also close to self-deception involving denial.

Defensive optimism has a counterpart called *defensive pessimism* (Norem, 2008; Norem & Cantor, 1986); people use defensive pessimism as a strategy to prepare for anxiety-provoking events or performances. We suggest that both defensive pessimism and defensive optimism are motivated by anxiety. However, whereas the negative possible outcomes of a situation often motivate defensive pessimists to work harder for successful results, the prediction of positive outcomes does not motivate defensive optimists to take additional actions that may help to promote health-promoting false calm.

Whereas defensive optimism is an unrealistic belief in a positive future and/or optimistic expectancy of positive outcomes higher than the objective probability would warrant, *constructive optimism* refers to the belief in the role of effort, with a sense of control (Langer, 1975). Due to real persistence, constructive optimism may effectively prevent the spread of the virus. Both types of optimism deal with overcoming stressful situations, but constructive optimists acquire a sense of control and agency, believing in the role of efforts, whereas defensive pessimists seemingly succeed in coping with the anxiety related to uncontrollable events.

Autonomous and Controlled Motivation of Healthy Behavior

Any purposeful behavior implies the presence of motivation, including behavior associated with following the rules of quarantine and self-isolation. Self-Determination Theory (SDT) is one of the most influential contemporary theories of human motivation, which has successful applications in basically all domains of human life, including health and following a doctor's orders (Ryan & Deci, 2017). According to SDT, motivation differs not only in quantity, but also in quality, where "quality" refers to the relative degree of autonomy or self-determination (Ryan & Deci, 2000). *Autonomous motivation* comprises both intrinsic motivation and the types of extrinsic motivation in which people have identified with an activity's value and have integrated it into their sense of self. Conversely, *controlled motivation* consists of both introjected regulation, in which the regulation of action has been partially internalized and is energized by factors such as avoidance of shame and guilt, contingent self-esteem, pride, and external regulation, in which one's behavior is a function of external contingencies of reward, approval, or punishment.

In the health domain, it has been shown that autonomous forms of motivation are generally more effective in predicting health behavior than controlled forms (Hagger et al., 2014). Being autonomously motivated can promote engagement in and maintenance of health behaviors (Deci & Ryan, 2000; Ng et al., 2012; Patrick & Williams, 2012). Autonomous motivation has been positively associated with oral health behaviors (brushing and flossing one's teeth) (Halvari & Halvari, 2006), exercise and weight loss (Silva et al., 2011), healthy eating behavior (fruit/vegetable intake) (Dwyer et al., 2017; McSpadden et al., 2016; Shaikh, Yaroch, Nebeling, Yeh, & Resnicow, 2008), and it can predict health-related behaviors among adolescents, such as more physical activity and less marijuana use, smoking, and sexual intercourse (Gillison, Sebire, & Standage, 2012; Hardy, Dollahite, Johnson, & Christensen, 2015; Verloigne et al., 2011).

As to personality variables that predict autonomous motivation of healthy behavior, research to date is scarce. One study found that domain-specific optimism — optimism for the specific purpose of engaging in exercise — proved to be one of the best predictors of exercise engagement after autonomous motivation, whereas dispositional optimism was not related to exercise engagement and autonomous motivation (Gassman, 2019).

We hypothesized that defensive COVID-19-related optimism could have harmful consequences, undermining autonomous motivation to follow the recommendation to stay at home during a quarantine period. In particular, the effort to maintain healthy behavior during a pandemic can decrease if a person believes that the situation is not dangerous.

Methods

Given the theoretical and empirical evidence presented above, the purpose of the current study was to examine the mediating effects of the two types of specific optimism (constructive and defensive) and of autonomous motivation on the health-supportive behavior of Russian young adults, with respect to adherence to the recommendation to stay at home.

Prior to testing the mediation model, we first examined the psychometric properties of a new measure, the Constructive–Defensive Optimism Questionnaire (CODOQ), to enhance the scale’s usability for both research and practice using the sample of the present study. Subsequently, we addressed the following specific research hypotheses:

H1: Constructive optimism would be positively associated with dispositional optimism and well-being, whereas defensive optimism would be negatively associated with dispositional optimism;

H2: Autonomous motivation would mediate the positive impact of constructive optimism on staying-at-home behavior;

H3: Autonomous motivation would mediate the negative impact of defensive optimism on staying-at-home behavior;

H4: In accordance with our previous research on dispositional optimism in Russian samples (Gordeeva, Sychev, & Osin, 2021), we expected that women would display higher dispositional optimism and constructive optimism than men.

Participants and Procedure

Participants were 1,403 students from different universities in two large cities in the Far East of Russia and the Urals. The sample comprised 956 (68%) women and 447 men, age $M = 20.59$, $SD = 3.66$. Participants completed a battery of questionnaires online. The study started on April 10, 2020, two weeks after the introduction of the self-isolation mode (lockdown) in Russia (March 25, 2020), and ended on April 25, 2020.

Measures

Development of the Constructive and Defensive Optimism measure. Based on the construct’s definition and prior literature, a pool of six face-valid items was

generated to assess constructive and defensive optimism during the coronavirus pandemic. The content of the items reflects 1) the importance of efforts for coping with problems caused by the pandemic, along with the flexible view of the current situation typical of constructive optimism, and 2) defensive denial, including “positive” underestimation of the problem (similar to “rose-colored glasses”) (see items of the questionnaire in *Table 1*). All items were rated on a Likert-type scale ranging from 1 (*absolutely do not agree*) to 5 (*totally agree*). The reliability coefficients (Cronbach’s α) for all scales used in this study are presented in *Table 2*.

Dispositional optimism was assessed by the Russian version of the Life Orientation Test–Revised (Gordeeva et al., 2021; Scheier, Carver, & Bridges, 1994). This measure includes three positively worded items, three negatively worded items, and six filler items, rated on a scale from 0 (*strongly disagree*) to 4 (*strongly agree*).

Motivation to adhere to recommendations was measured with a questionnaire based on the UPLOC developed by SDT researchers (Sheldon, Osin, Gordeeva, Suchkov, & Sychev, 2017). This version of the questionnaire consists of one main question regarding the reasons for following the recommendations (“*Please explain the reasons why you are following these recommendations (at least to a small extent).*” “I plan to follow the recommendations and stay at home as much as possible, because...”) and two subscales, each with 4 items, measuring autonomous and controlled motivation. Examples of the items are: “The recommendations reflect my values” (autonomous motivation) and “I don’t want to be criticized for not following the recommendations” (controlled regulation). Respondents rated their agreement with each item on a scale from 1 (*not at all true*) to 7 (*very true*).

Adherence to the recommendation was measured with a single item asking about how much the person adheres to the recommendation to stay at home. Participants chose from 1 (*not at all*) to 7 (*totally follow this recommendation*).

To establish construct validity of the specific optimism measure, we used three additional well-being questionnaires. *Life satisfaction and happiness* were measured with Russian versions (Osin & Leontiev, 2020) of the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985) and the Subjective Happiness Scale (SHS; Lyubomirsky & Lepper, 1999). The SWLS consists of five items which were rated on a scale from 1 (*strongly disagree*) to 5 (*strongly agree*), and the SHS consists of four items rated on a 7-point scale. *Emotional well-being* was assessed using the Russian version of the Positive and Negative Affect Schedule (Osin, 2012; Watson, Clark, & Tellegen, 1988), which consists of two 10-item scales to measure both positive and negative affect over the last week. Each item is rated on a scale from 1 (*not at all*) to 5 (*very much*).

Data Analysis

Structural equation modeling was undertaken in Mplus 8, using robust maximum likelihood estimation (MLR). To assess the significance of mediated effects in the structural model, the bootstrap method, with 5,000 samples, was used in Mplus (Muthén & Muthén, 2015). Other analyses, including descriptive statistics, correlations analysis, exploratory factor analysis (EFA), and t-tests were carried out using R.

Results

Preliminary Analysis of the New Measure of Constructive and Defensive Optimism

To test the structure of the new measure of constructive and defensive optimism, we implemented EFA using the “minimum residuals” estimation method and parallel analysis for assessing the number of factors. The KMO measure of sampling adequacy (KMO = .69) and Bartlett’s test of sphericity $\chi^2(15) = 1,859.74, p \leq .001$ both indicated that it was appropriate to apply factor analysis to this set of data. Two moderately correlated factors ($r = .20$) were extracted, which explained 48% of the total variance. Factor loadings after “oblimin” rotation, presented in *Table 1*, show that the empirical structure of the questionnaire corresponded to the hypothesized structure.

Table 1

Results of the exploratory factor analysis of the new measure of constructive and defensive optimism (N = 1,403)

Items	Factor loading	
	Factor 1	Factor 2
1. I believe that by making efforts, we can improve the situation and find optimal solutions to problems.	.00	.78
2. I think that everyone is exaggerating; in fact, this virus is not as dangerous as they say.	.81	-.02
3. I think that now we must hope for the best, but prepare for the worst and remain calm.	-.01	.55
4. The people around me and the media overstate the problem; in fact, everything will be fine.	.69	.08
5. I believe that our efforts can help prevent the spread of the disease.	.00	.66
6. In the current situation, we have nothing to worry about; I do not see any real danger.	.62	-.08
Eigenvalues	1.52	1.37
Percentage of explained variance	25%	23%

Further, we tested the fit of the model with two correlated factors using CFA. Cross loadings and covariances between items were not allowed. The results of analysis indicated a good fit of this model: $\chi^2 = 27.11, df = 8, p \leq .001, CFI = .985, TLI = .971, RMSEA = .041$ (90% CI = [.025, .059]), PCLOSE = .777, $N = 1,403$. All factor loadings were higher than .55 and significant at $p \leq .001$; correlation between latent factors was $-.28 (p \leq .001)$. The reliability coefficients (Cronbach’s α) of scales were .70 for constructive optimism and .75 for defensive optimism.

The construct validity of the scales of constructive and defensive optimism is confirmed by the correlations with well-being indicators (see *Table 2*). As expected, constructive optimism showed weak positive correlations with indicators

of well-being such as positive affect, satisfaction with life, and subjective happiness (r from .12 to .17; both at $p \leq .001$), while defensive optimism did not correlate with any indicators of well-being (r from $-.02$ to $.03$; none are significant). These results indicate that constructive optimism may help to maintain a higher level of well-being during a pandemic, but defensive optimism, as a relatively ineffective type of coping with problems, is irrelevant for well-being. Accordingly, we found the opposite correlations of dispositional optimism with constructive ($r = .25$; $p \leq .001$) and defensive optimism ($r = -.07$; $p \leq .01$), which confirms that the last two constructs are completely different in nature.

Correlations of Different Types of Optimism with Health-Related Variables and Gender

Health-related variables showed the expected correlations with these two specific types of optimism (see Table 2). In particular, constructive optimism was moderately positively associated with autonomous motivation ($r = .45$; $p \leq .001$) and adherence to recommendations ($r = .28$; $p \leq .001$). The opposite, negative correlations, were found between defensive optimism and autonomous motivation ($r = -.29$; $p \leq .001$) and adherence to recommendations ($r = -.15$; $p \leq .05$). In addi-

Table 2
Descriptive statistics and correlations between different types of optimism, motivation, adherence to recommendations and well-being ($N=1,403$)

	α	Mean	SD	1	2	3	4	5	6	7	8	9	10
1. Constructive optimism	.70	4.00	0.83	1	-.20***	.24***	.44***	.03	.26***	.12***	-.07**	.16***	.16***
2. Defensive optimism	.75	2.48	0.9	-.20***	1	-.06*	-.28***	.15***	-.14***	.01	-.01	.02	.01
3. Dispositional optimism	.78	2.43	0.73	.25***	-.07**	1	.17***	-.13***	.08**	.37***	-.29***	.41***	.55***
4. Autonomous motivation	.81	5.46	1.42	.45***	-.29***	.20***	1	.26***	.41***	.14***	-.02	.16***	.14***
5. Controlled motivation	.73	3.71	1.66	.03	.15***	-.13***	.25***	1	.09***	-.05	.11***	0.00	-.10***
6. Adherence to recommendations	–	6.15	1.25	.28***	-.15***	.06*	.40***	.09***	1	.05*	-.07*	.11***	.06*
7. Positive affect	.89	2.98	0.77	.12***	.01	.37***	.14***	-.05	.06*	1	-.50***	.45***	.52***
8. Negative affect	.88	2.58	0.84	-.05	-.02	-.31***	-.04	.11***	-.05	-.49***	1	-.35***	-.47***
9. Satisfaction with life	.80	3.26	0.73	.15***	.03	.42***	.17***	.00	.11***	.45***	-.35***	1	.57***
10. Happiness	.76	4.24	1.27	.17***	.01	.55***	.14***	-.10***	.07*	.52***	-.46***	.57***	1

Note. The correlations controlled for gender are presented above the diagonal; the zero-order correlations are presented below the diagonal; * $p \leq .05$, ** $p \leq .01$, *** $p \leq .001$; α = Cronbach's α .

tion, defensive optimism demonstrated weak positive correlation with controlled motivation ($r = .15; p \leq .001$).

Participants reported significantly higher autonomous motivation to follow stay-at-home recommendations ($M = 5.46, SD = 1.42$) compared to their controlled motivation ($M = 3.71, SD = 1.66$), and both types of motivation were related to stay-at-home behavior, with much stronger correlation in the former case ($r = .40; p \leq .001$).

Analysis of differences between men and women using Welch's *t*-test (see Table 3) demonstrated that women were more prone to follow the recommendation to stay at home (at $p \leq .001$), and were also higher in constructive optimism, dispositional optimism, and autonomous motivation (all $p \leq .001$), while men were slightly higher than women in defensive optimism ($p \leq .05$). Most of these differences were small; however, the effect of gender on autonomous motivation was medium (Cohen's $d = .45$).

Given that many study variables turned out to be dependent on gender, we included it as a controlled variable in all statistical analyses. Correlations among study variables controlling for gender (see Table 2, above the diagonal) were close to the zero-order correlations.

Table 3
Gender differences in different types of optimism, motivation, adherence to recommendations, and well-being

	Means		SD		Welch's <i>t</i> -test	<i>df</i>	<i>p</i>	Cohen's <i>d</i>
	Female (N = 956)	Male (N = 447)	Female	Male				
1. Constructive optimism	4.08	3.81	.76	.94	5.34	724.8	$\leq .001$.33
2. Defensive optimism	2.44	2.57	.88	.93	-2.40	830.8	.017	.14
3. Dispositional optimism	2.51	2.25	.73	.69	6.30	918.2	$\leq .001$.35
4. Autonomous motivation	5.66	5.04	1.31	1.55	7.35	754.4	$\leq .001$.45
5. Controlled motivation	3.72	3.67	1.68	1.62	.56	899.2	.577	.03
6. Adherence to recommendation	6.25	5.94	1.13	1.46	3.93	703.0	$\leq .001$.25
7. Positive affect	2.99	2.94	.74	.82	1.22	801.7	.223	.07
8. Negative affect	2.64	2.44	.83	.86	4.07	847.9	$\leq .001$.24
9. Satisfaction with life	3.25	3.29	.73	.72	-1.04	885.8	.300	.06
10. Happiness	4.28	4.15	1.27	1.27	1.80	869.4	.071	.10

Structural Equation Modeling of Relations among Gender, Different Types of Optimism, and Health-Related Variables

We applied structural equation modeling to analyze the overall effect of different types of optimism and motivation on following the recommendation to stay at home. Adherence to the recommendation was included in the model as a dependent variable, along with the factor of autonomous motivation as its main predictor and two factors of constructive and defensive optimism. Given the small effect of controlled motivation on adherence to the self-isolation recommendation and its weak correlations with different types of optimism, the factor of controlled motivation was not incorporated into the model. We expected that the effect of constructive and defensive optimism on adherence to the recommendation may be direct or mediated by autonomous motivation. On the basis of the observed correlations, we added to the model the factor of dispositional optimism (with an auxiliary orthogonal factor of response style needed for explaining shared variance of negatively worded items) as a predictor of constructive and defensive optimism. Last, we included gender as a predictor of all other variables to control for its effects. Estimation of this model showed that there were four insignificant parameters in spite of acceptable values of fit indices. After exclusion of these insignificant parameters, we obtained the model presented in the *Figure 1* below, which had a satisfactory fit: $\chi^2 = 416.81$; $df = 125$; $p \leq .001$; CFI = .946; TLI = .935; RMSEA = .041 (90% CI = [.037, .045]), PCLOSE = 1, $N = 1,403$.

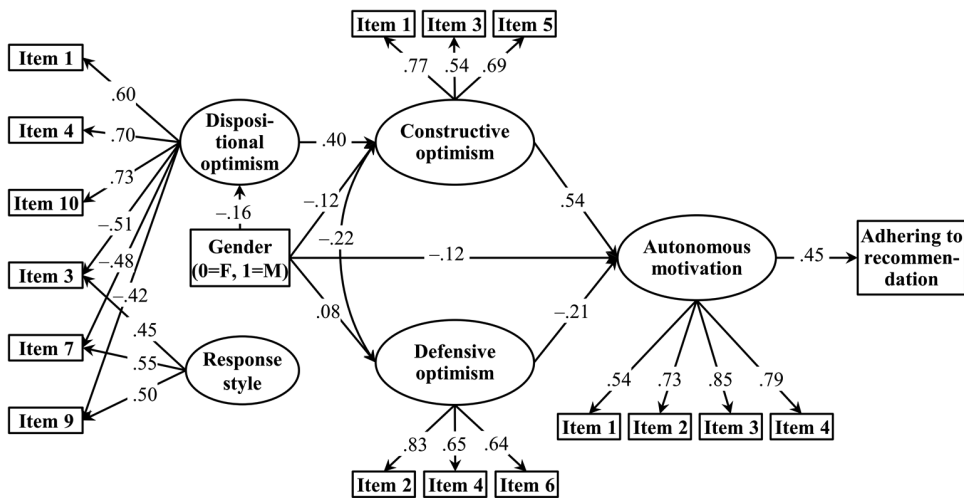


Figure 1. The structural model of relations among the different types of optimism, autonomous motivation, and adherence to the self-isolation recommendation, controlling for gender (all coefficients are standardized and significant at $p \leq .05$, $N = 1,403$).

Analysis of the indirect effects of different types of optimism and of gender on following the recommendation to stay at home in the presented structural model revealed that all tested effects were statistically significant (see *Table 4*).

Table 4
Indirect effects of different types of optimism and gender on adherence to the recommendation of self-isolation

Predictors	Mediators	Standardized indirect effect	<i>p</i>
Constructive optimism	Autonomous motivation	.24	≤ .001
Defensive optimism	Autonomous motivation	-.10	≤ .001
Dispositional optimism	Autonomous motivation and constructive optimism	.10	≤ .001
Gender	Autonomous motivation, defensive optimism, constructive optimism, and dispositional optimism	-.11	≤ .001

Thus, the structural model reveals that adherence to the recommendation to stay at home depends on constructive situation-specific optimism, and underlying it, dispositional optimism via autonomous motivation. At the same time, the “adherence to the self-isolation recommendation” variable is inversely related to defensive optimism via autonomous motivation. The effect of gender on adherence to the recommendation is fully mediated by different types of optimism and autonomous motivation.

Discussion

We found that compliance with quarantine rules during the COVID-19 pandemic significantly depends on personality and motivational variables, primarily optimistic beliefs and autonomous motivation. Based on the literature on dispositional optimism, unrealistic optimism, and defensive pessimism, we differentiated two types of specific optimism in the context of the COVID-19 pandemic: constructive and defensive optimism. As predicted, we have shown that situation-specific optimistic beliefs may have different forms — constructive and defensive — with different motivational and behavioral consequences related to the COVID-19 pandemic. Constructive optimism includes belief in the importance of efforts for coping with problem and a sober assessment of its real difficulties, while defensive optimism implies “positive” underestimation of the problem and its denial.

With regard to the psychometric properties of the newly developed specific optimism measure, the results confirmed that it is a valid and reliable measurement instrument for assessing COVID-19-related optimism, demonstrating satisfactory internal consistency. The questionnaire showed satisfactory reliability of the scales and its two-factor structure was successfully confirmed using EFA and CFA. The two types of specific optimism were weakly negatively interrelated and showed opposite associations with general dispositional optimism and well-being.

Structural modeling showed that constructive and defensive optimism have the expected effects on the autonomous motivation to follow the recommendation to stay at home, and indirectly (via motivation) on real adherence to this recommendation. Both dispositional optimism and specific constructive optimism predict au-

onomous motivation and health-related behavior, while defensive optimism has the opposite, undermining, effects. The discovered gender differences in these two types of optimism provide a possible explanation for better adherence to the recommendations typical of women, confirmed by the results of structural modeling and analysis of indirect effects. Finally, our results on gender differences are consistent with those obtained by other researchers. In particular, Solomou and Constantinidou (2020) showed that males reported lower levels of compliance with precautionary measures.

Following previous research on self-control (Holding, Hope, Verner-Filion, & Koestner, 2019), these results contribute to self-determination theory considering personality predictors, i.e., the role of generalized and specific optimism in autonomous motivation related to healthy behavior. Previous research in this field has mostly concentrated on environmental predictors of autonomous and controlled motivation.

Conclusion

Our results suggest that in addition to dispositional optimism, situation-specific constructive and defensive optimism are essential for explaining the health-related behavior. While constructive optimism supports adherence to the recommendation to stay at home via autonomous motivation, defensive optimism undermines it. These results contribute to self-determination theory, considering the role of personality factors in determining motivation.

Implications and Limitations

Our study has important practical implications. High dispositional optimism and constructive specific optimism and low defensive optimism impact the quality of motivation and promote adaptive health behavior during a pandemic. This means that support for realistic optimistic beliefs is recommended to mass media and public institutions, to promote both healthy attitudes and behavior. This is, of course, easier said than done, but doctors and the media should strive for a realistic and at the same time optimistic reflection of COVID-19 related events.

A limitation of this research was the participants' age, mostly under the age of 30. Prior studies showed that dispositional optimism tends to decline in older age (Gordeeva et al., 2021; Hinz et al., 2017), so the age-related changes in constructive and defensive optimism need further research. Also age was found to be a significant predictor of reactions to COVID-19-related stress (de Pedraza et al., 2020; Solomou & Constantinidou, 2020), with young people suffering more (Pervichko et al., 2020). Future studies may benefit from considering whether constructive and defensive optimism are associated with changes in motivation quality and well-being over time. Thus, a longitudinal design is preferable in the future to understand the causal role of both dispositional and constructive optimism in COVID-related health behavior and well-being.

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