

Meaningfulness Buffers and Crisis of Meaning Mediates The Longitudinal Effect of Covid-19 Stress On General Mental Distress

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Research Article

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Abstract

Background: Reactions to the COVID-19 pandemic are diverse. People who experience the situation as stressful (COVID-19 stress) appear vulnerable to developing general mental distress. Moreover, existential crises can arise. The identification of buffering factors and their effect over time is therefore highly relevant. The current study examined longitudinal protective effects of meaningfulness and self-control and negative effects of crisis of meaning on general mental distress.

Methods: N=431 participants from Germany and Austria (mean age: 42 years) completed an online survey in both April/May (T1) and July/August 2020 (T2). We examined (i) whether two personal resources, meaningfulness, and self-control, measured at T1, moderated the longitudinal effect of COVID-19 stress (T1) on general mental distress (T2), and (ii) whether crisis of meaning (T1) mediated the latter effect.

Results: Meaningfulness and self-control predicted lower symptoms of anxiety and depression over time, and crisis of meaning predicted higher symptoms. Meaningfulness but not self-control buffered the longitudinal effect of COVID-19 stress on general mental distress. COVID-19 stress was associated with crisis of meaning which, in further consequence, predicted general mental distress three months later.

Conclusions: Meaningfulness and self-control appear to have generally protective effects on psychological distress. Moreover, meaningfulness seems to be particularly protective when people feel burdened by the situation. Strengthening this resource is thus especially appropriate for vulnerable populations. Measures that support meaningfulness will also prevent the emergence of crises of meaning, which can be triggered by acute stress reactions and appear to affect mental health in the longer term.

Background

In March 2020, the WHO declared COVID-19 to be a pandemic. The early phase of the pandemic was accompanied by increased levels of general mental distress in the general population in Germany and Austria as in many other countries [1–6]. Several relevant resources were identified that appeared to serve as protective factors. Older age [7] and male gender [8] were associated with higher mental stability in terms of demographic characteristics. Supportive psychological characteristics were trust in the healthcare system [9, 10], psychological flexibility and acceptance of difficult experiences [11], self-esteem [12], resilience [13], and self-control [2, 14].

Beyond threatening mental health, large-scale crises also have the potential to shatter worldviews, jeopardize existential security, and trigger crises of meaning [15–17]. Several researchers have addressed existential experiences during the pandemic. Besides an intensified confrontation with one's mortality [18, 19], experiences of meaning – or its loss – are of crucial importance here. In times of crisis, meaningfulness is a resource that fundamentally determines whether a person sees their life as worth living and is therefore willing and motivated to actively overcome challenges and take responsibility for

their health [17]. Various studies have shown that meaning in life was a protective factor during the pandemic [2, 20–23]. At the same time, it emerged that for quite a few people, the large-scale crisis was accompanied by a shaking of their worldview [24]. High levels of acute stress caused by the pandemic were linked to crises of meaning, which in turn predicted high levels of general mental distress [2]. The latter study also found that meaningfulness and crisis of meaning covaried with the pandemic-related restrictions in Germany and Austria. Meaningfulness was high and crisis of meaning low during the first lockdown, which met with very high approval from the population [25]. Meaningfulness was substantially lower and the crisis of meaning higher for the second survey period covering the weeks immediately following the lockdown, a time characterized by insecurity, contradictions in the communication of public health measures, and regional differences regarding the measures in force. This suggests that public health measures - or the way they are communicated and implemented - may have far-reaching consequences in the lives of individuals [26].

Long-term investigation of such processes is therefore desirable. Protective effects of meaning in life have since been confirmed in longitudinal studies among Chinese students [27–29] and Turkish students [20]. To our knowledge, studies in the general population and other countries are still pending. The present study aimed to examine the protective effects of meaningfulness and self-control in a German-speaking general population and, beyond this, to test moderation and mediation effects – as reported by Schnell & Krampe (2020) [2] – in a longitudinal design. Specifically, we examined two hypotheses: (i) whether meaningfulness and self-control as measured during the first months of the pandemic (T1) moderated a putative effect of COVID-19 stress at T1 on general mental distress measured three months later (T2), and (ii) whether crisis of meaning (T1) mediated the putative effect of COVID-19 stress at T1 on general mental distress at T2.

Methods

Procedure and participants

We conducted power analyses to ensure sufficient power. Associations between meaning in life and mental health are typically medium to large [cf. 17]. Assuming a medium effect size ($f^2 = .15$), $\alpha = .05$, and power = .95, G*Power [30; version 3.1.9.6] determined a necessary sample size of $N = 153$ for a double moderation model with two covariates. Monte Carlo Power Analysis for Indirect Effects [31] was used for simple mediation analysis. Targeting a power of .95 and using correlation coefficients and standard deviations from a prior cross-sectional study [2], a necessary sample size of $N = 106$ was determined. Online surveys were conducted during the first wave of the pandemic in April/May 2020 (T1) and in a period of relatively low incidence in July/August 2020 (T2). Inclusion criteria were providing informed consent, minimum age of 18 years, completion of the questionnaires, and affirming honest responses. Consent to repeat participation was not an inclusion criterion. $N = 1,568$ participants completed the questionnaire at T1, $N = 431$ took part at T2. Evidence of biased attrition was found for education only: Participants at T2 were slightly more educated, odds ratio = 1.21 (standardized predictors). Thirty-four percent reported secondary or advanced education, 66% had a university degree. Sixty-six percent

identified as women and 34% as men. The mean age was 42 (SD = 17; two missing values), ranging from 18 to 82 years. Fifty-three percent were resident in Germany, 41% in Austria, the remainder in Switzerland or Italy.

Measures

At T1, a seven-item COVID-19 stress scale [2, 32, 33] was employed to determine the experience of acute stress due to the pandemic. Using a six-point Likert scale (0-5), it taps feelings of intolerability, boredom, anger, fear, and pessimism. In the present study, Cronbach's alpha was .79.

Two dimensions of meaning in life, meaningfulness and crisis of meaning were assessed by the respective 5-item scales from the Sources of Meaning and Meaning in Life Questionnaire, using a six-point Likert scale (0-5) (SoMe; [34, 35]). Cronbach's alphas were .81 and .92, respectively.

Self-control, i.e., a person's ability to control or modify their impulses, was assessed using the 13-item SCS (SCS-KD; [36]; five-point Likert scale, 1-5). Cronbach's alpha was .82.

At T2, general mental distress was measured by the PHQ-4 [37], a brief four-item measure of core symptoms of depression and anxiety (four-point Likert scale, 0-3). Cronbach's alpha was .83.

Analysis

We used PROCESS 3.5 for SPSS [38] to conduct a double moderation (model 2) and a simple mediation (model 4) analysis, tested with percentile bootstrapping based on 5,000 bootstrap samples. Age and education covaried with the dependent variable and were thus included as covariates. Skewness and kurtosis for all variables were in acceptable ranges. In the double moderation analysis, general mental distress (T2) served as the dependent variable, COVID-19 stress (T1) as the independent variable, and meaningfulness (T1) and self-control (T1) as moderators. Variables defining products were mean-centered. In the simple mediation analysis, general mental distress (T2) served as the dependent variable, COVID-19 stress (T1) as the independent variable and crisis of meaning (T1) as mediator.

Results

Table 1 presents descriptive statistics and correlations between study variables, age, and education.

Table 1
Descriptive statistics and correlations between study variables, age, and education.

	%	M/SD	α	(2)	(3)	(4)	(5)	(6)	(7)
(1) COVID-19 stress (T1) ^a		1.44/0.90	.79	-.19**	.29**	-.12*	.30**	-.11*	-.09
(2) Meaningfulness (T1) ^a		3.01/1.16	.81		-.65**	.30**	-.34**	.03	.13**
(3) Crisis of meaning (T1) ^a		1.08/1.26	.92			-.37**	.48**	-.03	-.08
(4) Self-control (T1) ^b		3.10/0.69	.82				-.28**	.06	-.00
(5) General mental distress (PHQ-4 sum score) (T2) ^c		2.97/2.59	.83					-.15**	-.11*
(6) Age		42/17							.19**
(7) Education: university	66								
Gender: female	66								
Residence: GER/AUT/other	53/41/6								
Family status: partnered	62								
Children: one or more	36								
Note. N = 431. ^a range = 0-5. ^b range = 1-5. ^c range = 0-12.									
* p < .05 (two-sided). ** p < .01 (two-sided).									

Examining the moderator effects of meaningfulness and self-control on the longitudinal effect of COVID-19 stress on general mental distress

The double moderation model was significant at $F(7, 421) = 17.95, p < .001, R^2 = .23$. COVID-19 stress (T1), meaningfulness (T1), self-control (T1), and age significantly predicted general mental distress (T2). Meaningfulness but not self-control moderated the longitudinal association between COVID-19 stress and general mental distress (see Table 2).

Table 2
 Double moderation of COVID-19 stress (T1) predicting general mental distress (T2)

Effect	Estimate	SE	t	95% CI for estimate		p
				LL	UL	
Intercept	3.80	0.32	11.87	3.17	4.43	<.001
COVID-19 stress (IV)(T1)	0.58	0.13	4.53	0.33	0.83	<.001
Meaningfulness (Mod 1)(T1)	-0.54	0.10	-5.29	-0.74	-0.34	<.001
Interaction IVxMod 1	-0.22	0.11	-2.12	-0.43	-0.02	.03
Self-control (Mod 2)(T1)	-0.68	0.17	-4.00	-1.01	-0.35	<.001
Interaction IVxMod 2	0.27	0.19	1.44	-0.10	0.63	.15
Age	-0.02	0.01	-2.71	-0.03	-0.01	.007
Education ^a	-0.13	0.24	-0.55	-0.61	0.34	.59

Note. N = 429. CI = confidence interval; LL = lower limit; UL = upper limit. ^a secondary or advanced = 1, university degree = 2.

As Figure 1 illustrates, the conditional effect of COVID-19 stress on general mental distress decreased with increasing scores of meaningfulness. In contrast, self-control did not affect the direction or strength of the relation between COVID-19 stress and general mental distress.

Examining crisis of meaning as a mediator of the longitudinal effect of COVID-19 stress on general mental distress

Figure 2 shows the results of a simple mediation analysis testing an indirect longitudinal effect of COVID-19 stress on general mental distress mediated by crisis of meaning. As hypothesized, crisis of meaning significantly mediated the longitudinal effect of COVID-19 stress on general mental distress. The indirect effect was statistically different from zero (indirect effect = 0.36, bootstrap 95% CI [0.20, 0.51]; completely standardized indirect effect = 0.12, bootstrap 95% CI [0.07, 0.18]). Higher COVID-19 stress was related to a higher crisis of meaning which, in turn, predicted higher general mental distress three months later. The direct effect of COVID-19 stress on general mental distress as measured three months later remained significant, indicating that pandemic stress also contributed to symptoms of anxiety and depression independently of a crisis of meaning.

Discussion

The question of whether or not we perceive our lives as meaningful has profound implications for how we relate to ourselves and our environment [17]. The evaluation of life as meaningful determines whether we see life as worth living at all and are thus motivated to invest in constructive interaction with the environment - even if this should be challenging [39]. Apart from this activating and motivating function

which has been replicated by several studies [e.g., 40, 41], meaningfulness also has a buffering function: It impacts how people cope with existing stress or pain [42, 43]. The present study offers another example of this buffer effect by focusing on stress caused by the COVID-19 pandemic. Over three months, meaningfulness predicted general mental distress directly. It also served as a moderator of the longitudinal relationship between COVID-19 stress and general mental distress: People who had reported high meaningfulness at T1 suffered substantially less from general mental distress at T2. Indeed, the total score of general mental distress (PHQ-4) was never elevated (exceeding a score of 3; [see 37]) when meaningfulness had been high at T1 (see Fig. 2). With a higher level of personal meaningfulness, severely stressed people were better able to cope with pandemic-related challenges and maintain their mental stability. Our study is thus in line with recent research that showed a risk-protective effect of meaning in life [27–29]. Additionally, it reveals how meaningfulness exerts a buffering effect under particularly stressful conditions.

Furthermore, we investigated the role of self-control. It is associated with numerous indicators of well-being, such as happiness [44], self-esteem [45], satisfaction with life [46], and mental health [47]. According to longitudinal studies, self-control can predict well-being and health up to 30 years later [48]. Also, in the present longitudinal study, people with high self-control at T1 reported less general mental distress three months later. However, a moderation effect of self-control was not confirmed. Thus, self-control did not buffer elevated stress over time, as observed in the cross-sectional study [2]. This might be attributable to contextual influences. At T1, the appearance of the pandemic and accompanying measures demanded much self-control from all of us. But higher-order goals were salient, which may have motivated self-control, especially under high stress [2]. As the pandemic situation at T2 was less critical, mental health might have been less dependent on self-control at this point.

A second focus of the current study was on the consequences of crises of meaning reported at the beginning of the pandemic. Here, a mediation effect was confirmed: High acute stress due to the pandemic was associated with elevated levels of crisis of meaning. These, in turn, predicted increased general mental distress three months later. Symptoms of anxiety and depression can thus partly be attributed to people's sense of having lost meaning in their lives. This can manifest in feelings of disorientation, alienation, arbitrariness, or incoherence [49]. The direct effect between COVID-19 stress and general mental distress remained significant when controlling for crisis of meaning, which indicates that pandemic stress does not necessarily and for everyone translate into an existential crisis but contributes to feelings of anxiety and depression for other reasons as well. This was to be expected, of course, since crises are perceived very differently by different people.

The outcomes of the present study are in line with the general scientific evidence. Considering the overall responses to the pandemic, the majority seems to be resilient, whereas some experience it as a critical interruption of the continuity of their life [50]. A significant minority questions previous social or personal priorities [24] and enters into a crisis of meaning [2]. Although such crises are typically accompanied by psychological suffering [51–53] and even suicidality [49], they also have a considerable constructive

potential: A more authentic approach to life, based on a more realistic - and thus more stable – worldview, seems to come into effect when crises are genuinely confronted [54, 55].

Strengths and limitations

This study's strengths include a longitudinal design with a substantial sample size and the employment of validated measures to assess general mental distress, meaning in life, and self-control. Its major limitation is the fact that the sample is not representative. We did not use random sampling, and women and more educated participants were over-represented. This was considered in the analyses by including education as a covariate, but not gender, as it was not related to the outcome variable, general mental distress. (When gender was included as a covariate nonetheless, results did not change substantially; findings not reported here.) Second, there was a slightly greater risk of dropout amongst individuals with lower education. However, this effect was small, and since the study focused on intrapersonal changes, we assume that attrition did not lead to any relevant bias.

Conclusion

Summarising the results indicates that existential questions should be taken seriously and targeted in times of large-scale crises - both in counseling and therapy and concerning public health measures. The latter can have a tangible impact on the four pillars of meaningfulness - significance, purpose, coherence, and belonging [17] through the design of the measures taken, their communication, and implementation [26]. Our data clearly show that enabling citizens to maintain meaning in their lives even under challenging conditions is an effective preventive measure against the emergence of mental health problems. The association of acute stress reactions with a crisis of meaning, by contrast, prospectively increased the probability of experiencing symptoms of depression and anxiety.

Declarations

Ethics Approval and Consent to Participate

Ethical approval was issued by the Review Board (Psychology) of the University of Innsbruck. The procedures used in this study adhere to the tenets of the Declaration of Helsinki and its later amendments. Informed consent was obtained from all individual participants included in the study.

Consent for publication

Not applicable

Availability of Data and Materials

The dataset generated and analysed during the current study is not publicly available because participants did not agree for their data to be shared publicly, but it is available from the corresponding author on reasonable request.

Competing Interests

The authors have no relevant financial or non-financial interests to disclose.

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Authors' Contributions

TS and HK collected, analyzed, and interpreted the data. TS conceptualized the study and wrote the manuscript. HK revised the manuscript. Both authors read and approved the submitted version of the manuscript.

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Figures

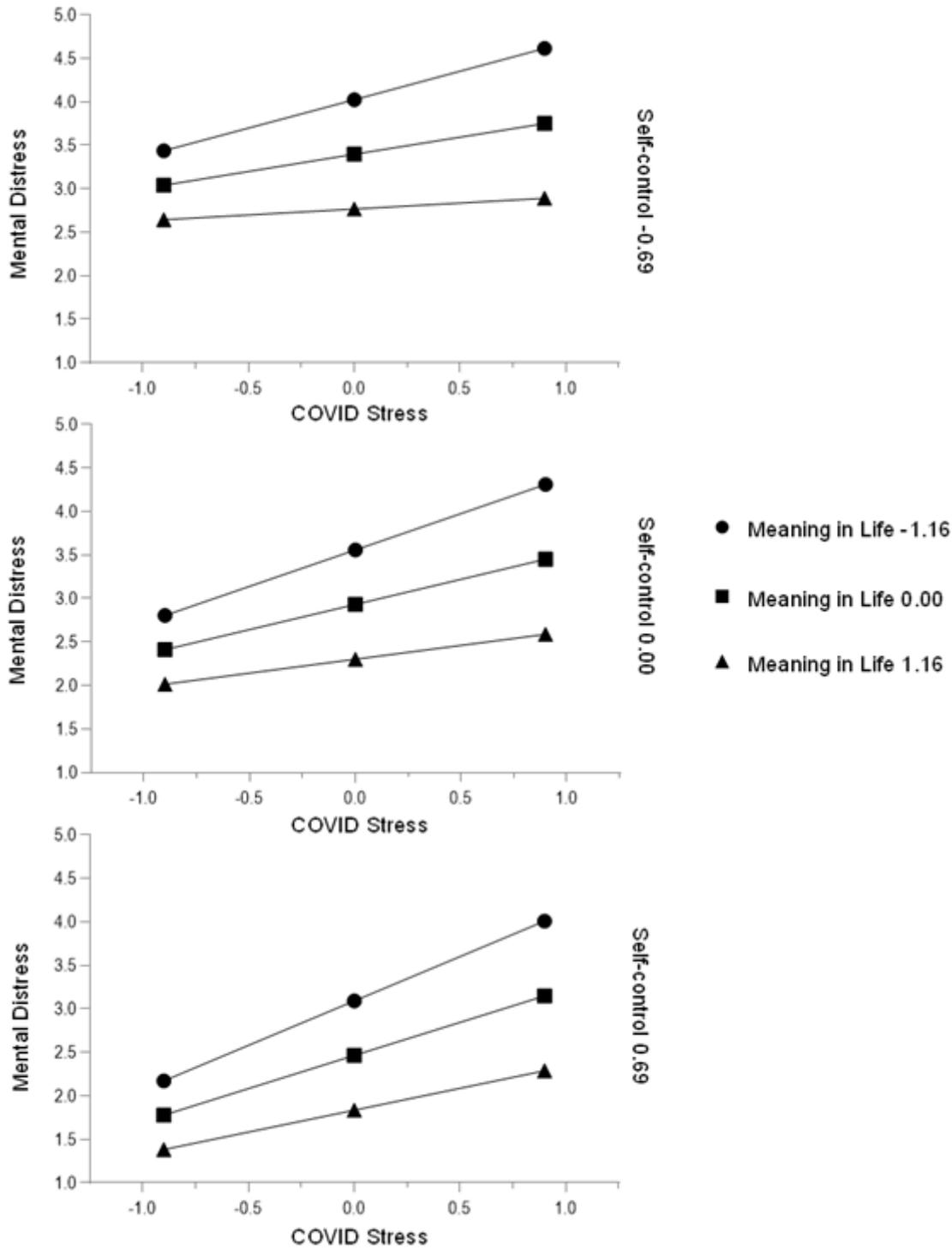


Figure 1

Conditional effects of COVID-19 stress (T1) on general mental distress (PHQ-4, T2) for low, mean, and high meaningfulness (T1) and low, mean, and high self-control (T1)

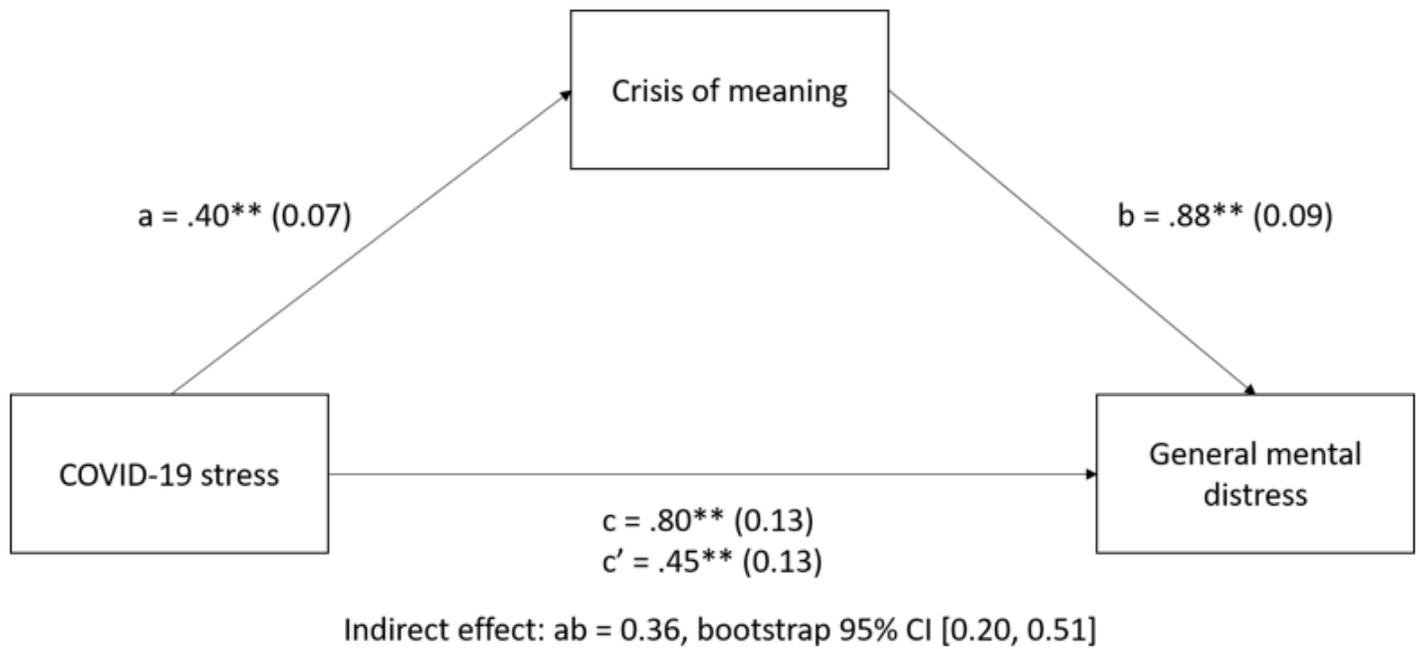


Figure 2

Mediation model of the effect of COVID-19 stress (T1) on general mental distress (T2) through crisis of meaning (T1).

Note. N = 429. Regression models adjusted for age and education. Coefficients are unstandardized ordinary least squares (OLS) regression coefficients. Path c represents the total effect of COVID-19 stress on general mental distress; path c' is the direct effect of COVID-19 stress on general mental distress.

** p < .001 (two-sided).