

## RESEARCH ARTICLE

# Having a prevention regulatory focus longitudinally predicted distress and health-protective behaviours during the COVID-19 pandemic

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## Abstract

People focussed on prevention (vs. promotion) are motivated by safety and are less inclined to take risks. We tested if having a prevention (vs. promotion) focus before the COVID-19 pandemic outbreak predicted threat perceptions and health outcomes throughout the pandemic. Participants ( $N = 161$ ) took part in a longitudinal study. Measures were assessed before the pandemic was declared (on November 2019, T1) and after a global pandemic was declared (on June 2020, T2). Participants who were more focussed on prevention prior to the onset of the pandemic (at T1) perceived greater risk and were more worried about contracting COVID-19, and engaged in more preventive behaviours during the pandemic (at T2). They also reported less anxiety and felt healthier later on (at T2). Exploratory analyses revealed that enacting preventive behaviours helped people cope with pandemic-related anxiety. Being motivated by security and enacting preventive behaviours seems to have helped people reduce anxiety over risk even during the pandemic.

## KEYWORDS

anxiety, health protection, preventive behaviours, regulatory focus, well-being, worry

The COVID-19 global pandemic caused a myriad of individual and social disruptions worldwide (United Nations, 2020). For example, since the onset of the pandemic, people have been experiencing more loneliness (e.g., Killgore et al., 2020), poorer psychological health and well-being (e.g., Qiu et al., 2020; Shanahan et al., 2020), poorer relationship quality and more relationship conflicts (Balzarini et al., 2020; Overall et al., 2021), and less sexual desire and sexual activity (Lehmiller et al., 2021; Wignall et al., 2021). Some researchers have examined how stressors related to COVID-19 influence relationships and well-being. For example, people who experienced more social isolation, stress, and financial strains during the pandemic also reported less relationship adjustment (Balzarini et al., 2020). Researchers have also been examining how individual differences shape people's behaviours, experiences, and well-being during the pandemic. For example, people who perceived greater danger for their health during this pandemic reported less life

satisfaction later on (Zacher & Rudolph, 2021), perceived to be more vulnerable to infection (Yildirim et al., 2020), and were more likely to adhere to social distancing regulations (Abdelrahman, 2020).

One individual difference that might be particularly important in influencing people's responses to a pandemic is the regulatory focus. According to Regulatory Focus Theory (Higgins, 2015), people with a prevention focus strive for security and avoid risks, whereas people with a promotion focus strive for growth and take risks. Hence, being motivated by security and being able to regulate feelings and actions in line with survival motives should be crucial in health-threatening contexts (Vohs & Baumeister, 2011; Zou & Scholer, 2016). Indeed, considering motivations towards security as a proxy for prevention focus, research also showed that people who were more motivated to protect their health reported engaging in behaviours that could help protect against contracting COVID-19 (e.g., washing hands) more frequently (Luo et al., 2020). However, research directly examining

how the regulatory focus has been shaping behaviours during the COVID-19 pandemic is extremely limited. One study found that people who were single and more focused on general prevention (vs. promotion) reported having sex with casual partners less frequently one month later because they perceived more pandemic-related threats (Rodrigues, Balzarini, et al., 2021). Another study found that people more focused on prevention (vs. promotion) in sexuality were more careful searching for information related to the COVID-19 virus (Rodrigues, 2021). This study shows that one's regulatory focus in specific domains (e.g., sexual health) can also shape broader health behaviours, which other researchers also argued for (e.g., Ferrer et al., 2017).

We launched a study examining the impact of regulatory focus in sexuality on sexual behaviours before the onset of COVID-19 (27 November 2019). By coincidence, the second measurement point on June 2020 (T2) occurred after a global pandemic had been announced, and subsequent social distancing measures were implemented in response (Balmford et al., 2020; United Nations, 2020). We took this valuable opportunity to examine for the first time if the regulatory focus on sexuality predicted how people responded and felt during the pandemic. Specifically, a longitudinal study with people from the UK and the USA examined if those who were more focussed on prevention (vs. promotion) prior to the COVID-19 pandemic perceived more health risks, behaved in accordance with their motives, and experienced more positive functioning.

## 1 | THE ROLE OF REGULATORY FOCUS ON HEALTH

The Regulatory Focus Theory (Higgins, 2015) postulates that people who are more focussed on prevention are motivated by security and protection and strive to avoid risks even at the cost of new opportunities. In contrast, people who are more focussed on promotion are motivated by growth and advancement and strive to obtain gains, even at the cost of risks. Research has shown that people more focussed on prevention are more aware of health threats (Rodrigues et al., 2019) and tend to be more careful with their health (Zou & Scholer, 2016). For example, these people are more likely to adhere to medical prescriptions (Avraham et al., 2016), take cancer screening tests (Ferrer et al., 2017), maintain smoking cessation (Fuglestad et al., 2013), and use condoms with casual partners (Evans-Paulson et al., 2021; Rodrigues et al., 2020). Having more control over their behaviours (Lemarié et al., 2019; Rodrigues, Lopes, & Carvalho, 2021) arguably helps people more focussed on prevention to enact health behaviours and feel protected against threats.

Examining the role of regulatory focus during this pandemic, one study showed that people who were single and more focused on prevention perceived more pandemic-related threats and consequently engaged in oral sex and intercourse less frequently and with fewer casual partners later on (Rodrigues, Balzarini, et al., 2021). Another study showed that people who were single and more focused on prevention in sexuality perceived to be well informed

about the pandemic, were more likely to retrieve COVID-19 information from reliable sources (e.g., scientific reports), were less fearful of becoming infected with COVID-19, had fewer intentions to have casual sex (Rodrigues, 2021). This suggests that having a focus on prevention can motivate people to be aware of health threats and more careful when searching for information and procedures that can help them protect their health. By doing so, they should feel more protected against infection (see also Rodrigues, Lopes, & Carvalho, 2021). Supporting this reasoning, people who felt that they were well-informed about COVID-19 also perceived to have the necessary skills to avoid infection (e.g., acquiring masks and using them correctly), engaged in more behaviours to protect themselves, and were less nervous and less anxious about becoming infected with the virus (Luo et al., 2020).

## 2 | CURRENT STUDY

Having a predominant focus on prevention (i.e., being motivated by security) heightens health concerns and fosters health-protective behaviours (Avraham et al., 2016; Ferrer et al., 2017; Fuglestad et al., 2013; Rodrigues et al., 2019, 2020; Zou & Scholer, 2016), but at the same time decreases threat concerns (Rodrigues, Lopes, & Carvalho, 2021) and helps activate specific behaviours and coping strategies to deal with the COVID-19 pandemic (Luo et al., 2020; Rodrigues, 2021). We took the opportunity to collect data in an ongoing project on regulatory focus in sexuality and sexual health behaviours. We reasoned that security motives—even if measured in a specific domain (see also Ferrer et al., 2017)—might have helped people alleviate some of the consequences of the pandemic on their functioning.

We had three main goals with this longitudinal study. First, we aimed to ensure the temporal stability of our regulatory focus in sexuality assessment and the predictive validity of our measure. Scores in the regulatory focus in sexuality measure were expected to correlate before (T1) and after (T2) the pandemic (H1a) and to predict scores in a general measure of regulatory focus after the pandemic (H1b). Second, we aimed to examine if regulatory focus (T1) predicted health outcomes during the COVID-19 pandemic (T2). Specifically, we expected people more focussed on prevention (vs. promotion) to perceive more pandemic-related risks (H2) and to be more worried about contracting COVID-19 (H3). These people should also enact behaviours that allow them to protect their health (H4), experience less anxiety due to the pandemic (H5), and feel more physically healthy (H6). Third, we tested our main hypotheses controlling for perceived life satisfaction before the COVID-19 pandemic and for country of residence. Life satisfaction and well-being have been associated with regulatory focus (e.g., Hanke et al., 2019; Zou et al., 2015) and have been shown to predict health outcomes (e.g., Diener & Chan, 2011; Lawrence et al., 2015; Smyth et al., 2017). Differences in health policies and government restrictions (Balmford et al., 2020) might have impacted how participants perceived and behaved during the COVID-19 pandemic. Lastly, we explored the

possibility that perceived risks, worry about contracting COVID-19, and preventive behaviours were the underlying mechanisms through which people more focussed on prevention experienced less anxiety and more physical health.

### 3 | METHOD

#### 3.1 | Procedure

We recruited a sample of people residing in the UK and the US through Clickworker in November 2019 (T1). Interested participants were invited to take part in a longitudinal study and were told that this study aimed at understanding people's sexual attitudes and behaviours. To participate, people had to be over the age of 18. At the onset of the study, potential participants were informed about their rights as participants (e.g., confidentiality, anonymity, possibility to withdraw from the study without penalties) and had to provide informed consent (e.g., indicate their agreement to participate) to be enrolled in the study. We sent out invitations through Clickworker to participants who completed the survey at T1, to take part in a follow-up study about sexuality in the times of COVID-19 in June 2020 (T2). Only participants that completed both waves of the survey were considered eligible. Participants were asked to report their regulatory focus in sexuality (at T1 and T2), as well as their general regulatory focus, their perceived risk of infection, how worried they were about contracting COVID-19, how frequently they engaged in preventive behaviours, their anxiety related to the pandemic, and their perceived health (all at T2). Additional measures were included for other purposes and will not be discussed further in this paper. At the end of each survey, participants were thanked, debriefed about the general goal of the project, and provided with the contact of the research team if they wanted more information about the research project or its results. Participants received \$1.5 (USD) for their participation at each wave. The Ethics Committee at Iscte-Instituto Universitário de Lisboa (#55/2020) approved this study before its initiation.

#### 3.2 | Participants

A power analysis using G\*Power (Faul et al., 2009) indicated that 158 participants would be needed to estimate a linear regression model with two predictors with medium effect size ( $f = 0.10$ ) and 95% power. This effect size was based on previous studies examining the associations of regulatory focus in sexuality with health-protective behaviours (e.g., Evans-Paulson et al., 2021; Rodrigues et al., 2020; Rodrigues, Lopes, & Carvalho, 2021). The online survey was initiated by 406 participants at T1. Of the 384 participants that completed the survey at T1, 165 participated in T2 (attrition rate: 42.97%). Of these, we excluded four participants with more than 10% missing cases in our main measures at T2 (Bennett, 2001). The final sample included 161 participants (51.6% women) with ages ranging from 18 to 50 years ( $M = 33.94$ ,  $SD = 7.54$ ). Participants were living in the UK

(50.9%) or the US (49.1%), and most of the participants identified as heterosexuals (76.4%), who were white (74.5%), lived in urban areas (43.5%), and were in the working class (47.8%; see the Electronic Supplemental Material for more details).

#### 3.3 | Measures

##### 3.3.1 | Regulatory focus (T1 and T2)

Using the measure developed by Rodrigues et al. (2019), we assessed motivations for prevention (three items, sample item: 'Not being careful enough with my sex life has gotten me into trouble at times';  $\alpha = 0.82$ ) and promotion in sexuality (six items, sample item: 'I am typically striving to fulfil my desires with my sex life';  $\alpha = 0.93$ ) at T1. Items for their respective subscale were mean aggregated. To reduce fatigue and maintain participant retention (Bolger et al., 2003) at T2, we selected the two most representative items from prevention ('Throughout my sex life I sometimes acted in ways that were objectionable, according to my education') and promotion ('I am primarily striving to create my "ideal sex life" - to fulfil my sexual desires and aspirations') based on the factor loadings reported in the original validation study. We also added the two most representative items of a widely used measure of general regulatory focus (Lockwood et al., 2002) assessing prevention ('In general, I am focussed on preventing negative events in my life') and promotion motives ('In general, I am focussed on achieving positive outcomes in my life'). In all cases, responses were given on 7-point scales (from 1 = *Not at all true of me* to 7 = *Very true of me*), with higher scores indicating a predominant focus on prevention or promotion.

##### 3.3.2 | Life satisfaction (T1)

A single-item retrieved from Cheung and Lucas (2014) was used to assess life satisfaction: 'In general, how satisfied are you with your life?'. Responses were given on a 7-point scale (from 1 = *Very dissatisfied* to 7 = *Very Satisfied*), with higher scores indicating higher perceived life satisfaction.

##### 3.3.3 | Perceived risk (T2)

We adapted the measure developed by Napper et al. (2012) to the COVID-19 context. Using 7-point response scales, participants were asked to make cognitive assessments of risk (three items; e.g., 'I think my chances of getting COVID-19 are'; 1 = *Zero* to 7 = *Very large*), affective or intuitive assessments of risk (three items; e.g., 'I feel vulnerable to COVID-19 infection'; 1 = *None of the time* to 7 = *All of the time*), and the salience of risk (two items; e.g., 'Getting COVID-19 is something I have'; 1 = *Never thought about* to 7 = *Thought about often*). All items were mean aggregated into one index ( $\alpha = 0.82$ ), with higher scores indicating a more perceived risk of COVID-19 infection.

### 3.3.4 | Worry (T2)

We used two items from the Love in the Time of COVID study (<https://loveinthetimeofcovid.me>) to assess the extent to which participants were worried about contracting COVID-19 ('To what degree are you worried about getting COVID-19?'), and having family members contracting COVID-19 ('To what degree are you worried about family members getting COVID-19'). Responses were given on a 5-point scale (1 = *Not at all* to 5 = *Extremely*). Items were mean aggregated,  $r = 0.70$ ,  $p < 0.001$ , with higher scores indicating more worry about contracting COVID-19.

### 3.3.5 | Preventive behaviours (T2)

We developed three items to assess how frequently people have been engaging in three types of preventive behaviours during the COVID-19 pandemic: 'To what degree have you self-isolated staying at home, avoiding public spaces?', 'To what degree have you been using masks or gloves while going out' and 'To what degree have you practiced other preventive measures (e.g., washing hands, wiping down surfaces)'. Responses were given on a 5-point scale (1 = *Not at all* to 5 = *A great deal*). Items were mean aggregated ( $\alpha = 0.69$ ), with higher scores indicating more frequent health-protective behaviours during the pandemic.

### 3.3.6 | Anxiety (T2)

We used the Generalized Anxiety Disorder Scale (Spitzer et al., 2006) to assess the frequency with which participants have been suffering from anxiety since the COVID-19 outbreak (seven items; e.g., 'Feeling nervous, anxious, or on edge'). Responses were given on a 4-point scale (0 = *Not at all* to 3 = *Nearly every day*). Items were mean aggregated ( $\alpha = 0.94$ ), with higher scores indicating greater pandemic-related anxiety.

### 3.3.7 | Perceived physical health (T2)

We used a single-item retrieved from the Short-Form Health Survey (Ware et al., 1996) and asked participants: 'Since the COVID-19 outbreak, how would you rate your physical health'. Responses were given on a 5-point scale (from 1 = *Poor* to 5 = *Excellent*), with higher scores indicating greater self-perceived physical health.

## 3.4 | Analytic plan

We computed overall correlations between variables and examined if regulatory focus scores were correlated in both waves (H1). We also conducted preliminary analyses to explore differences in our main predictor variable—regulatory focus—according to sociodemographic

variables using correlations and ANOVAs. This allowed us to determine if any covariates should be included in the main analyses. To test our main hypotheses, we computed linear regression models to examine if regulatory focus longitudinally predicted perceived risk of COVID-19 infection (H2), worry about contracting COVID-19 (H3), frequency of preventive behaviours (H4), anxiety due to COVID-19 (H5), and perceived health (H6). All models controlled for perceived life satisfaction at T1 and country of residence, together with any additional covariate identified in the preliminary analyses.

We additionally explored the possibility that regulatory focus predicted perceptions and behaviours later on, which then helped people cope with the pandemic and consequently increase well-being. We relied on previous research testing mediation models with two-wave longitudinal studies (e.g., Chen et al., 2019; Montoliu et al., 2021) and computed a mediation model using Mplus (Muthén & Muthén, 2012) using the Bayes estimator to account for our small sample size (Asparouhov & Muthén, 2021). Both prevention focus and promotion focus (at T1) were the predictor variables. Perceived pandemic-related risks, worry about contracting COVID-19, and frequency of preventive behaviours (at T2) were parallel mediators. Anxiety levels and perceived physical health (at T2) were the outcome variables. As in the previous analyses, we controlled for any additional covariates.

## 4 | RESULTS

### 4.1 | Preliminary analysis

Overall descriptive statistics and correlations between measures are presented in Table 1. As expected, results showed that scores on both prevention and promotion focus were significantly correlated in each wave, all  $p \leq 0.002$ . Furthermore, scores on each regulatory focus in sexuality at T1 were positively correlated with their respective scores at T2, all  $p < 0.001$ , and their respective general regulatory focus scores at T2, all  $p \leq 0.012$ .<sup>1</sup> The only exception was a non-significant correlation between scores on prevention focus in sexuality and general prevention focus at T2,  $p = 0.406$ . Results also showed life satisfaction to be positively correlated with promotion scores at T1,  $p = 0.038$ .

No significant correlations were found between regulatory focus at T1 and age, all  $p \geq 0.253$ . Moreover, no significant differences emerged for gender, all  $p \geq 0.113$ , sexual orientation, all  $p \geq 0.181$ , race/ethnicity, all  $p \geq 0.407$ , area of residence, all  $p \geq 0.358$ , or perceived socioeconomic status, all  $p \geq 0.062$ . Hence, no additional covariates were considered in our subsequent analyses.

### 4.2 | Longitudinal effects of regulatory focus

We tested the direct effect of regulatory focus on health outcomes with a series of linear regression models and included perceived life satisfaction as a covariate in these models (see Table 2). Results showed that people who were more focussed on prevention prior to the COVID-19 pandemic (at T1) perceived greater risk of COVID-19

TABLE 1 Overall Descriptive Information and Correlations

	Descriptive information		1	2	3	4	5	6	7	8	9	10	
	M (SD)	Range											
1. Prevention focus in sexuality (T1)	4.95 (1.68)	1-7	-										
2. Promotion focus in sexuality (T1)	4.50 (1.62)	1-7	-0.48***	-									
3. Life satisfaction (T1)	4.79 (1.43)	1-7	0.07	0.16*	-								
4. Prevention focus in sexuality (T2)	4.44 (1.94)	1-7	0.39***	-0.14	0.08	-							
5. Promotion focus in sexuality (T2)	4.53 (1.61)	1-7	-0.16*	0.28***	0.13	-0.28***	-						
6. General prevention focus (T2)	5.04 (1.58)	1-7	0.25***	-0.07	0.09	0.07	0.09	-					
7. General promotion focus (T2)	5.44 (1.46)	1-7	-0.02	0.17*	0.24**	0.01	0.26***	0.25**	-				
8. Perceived risk (T2)	4.18 (1.21)	1-7	0.15	0.02	0.04	-0.02	0.14	0.06	0.06	-			
9. Worry (T2)	3.31 (1.00)	1-5	0.20*	-0.04	0.06	0.00	0.22**	0.15	0.19**	0.78***	-		
10. Preventive behaviours (T2)	3.59 (1.03)	1-5	0.28***	-0.02	0.11	0.08	0.12	0.24**	0.26***	0.40***	0.53***	-	
11. Anxiety (T2)	1.27 (0.87)	0-3	-0.20*	0.05	-0.04	-0.28***	0.18*	0.13	0.02	0.43***	0.39***	0.14	-
12. Perceived physical health (T2)	3.13 (0.98)	1-5	0.22**	-0.06	0.18*	0.14	0.14	0.15	0.02	-0.21**	-0.14	0.02	-0.29***

\* $p \leq 0.050$ ; \*\* $p \leq 0.010$ ; \*\*\* $p \leq 0.010$ .

TABLE 2 Summary of the regression models predicting health outcomes during the COVID-19 pandemic

	Health outcomes (T2)				
	Perceived risk $\beta$	Worry $\beta$	Preventive behaviours $\beta$	Anxiety $\beta$	Perceived physical health $\beta$
Main predictors (T1)					
Prevention focus in sexuality	0.20*	0.24**	0.35***	-0.21*	0.22*
Promotion focus in sexuality	0.12	0.08	0.13	-0.06	0.02
Covariates					
Perceived life satisfaction (T1)	0.01	0.03	0.06	-0.01	0.16
Country of residence	-0.05	0.05	0.16*	0.20*	0.01

Note: Betas represent standardized estimates in the regression models predicting each health outcome. Country of residence coded as 0 = UK and 1 = USA.

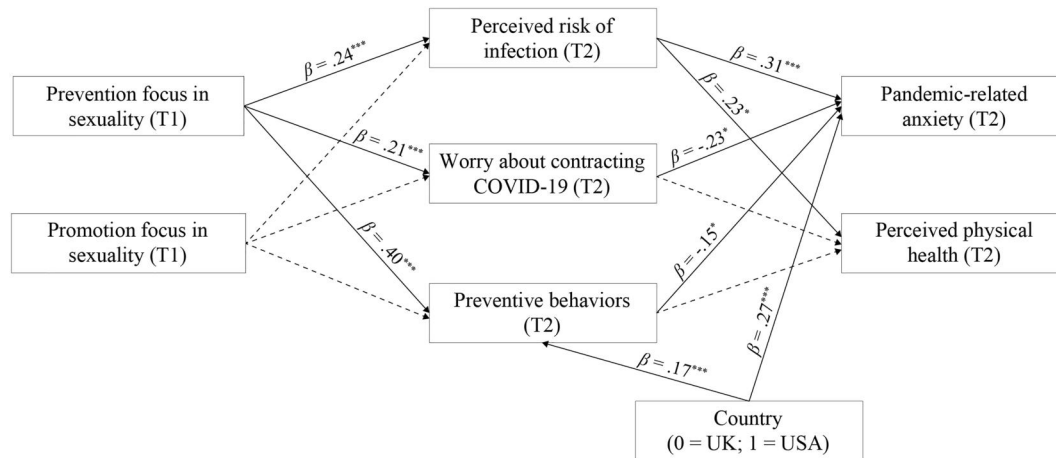
\*\*\* $p \leq 0.001$ ; \*\* $p \leq 0.010$ ; \* $p \leq 0.050$ .

infection,  $p = 0.029$ , were more worried about contracting the virus,  $p = 0.012$ , and enacted more preventing behaviours,  $p < 0.001$ , after the pandemic was declared (at T2). These people also experienced less pandemic-related anxiety,  $p = 0.019$ , and perceived better physical health,  $p = 0.016$ , at T2. No significant effects of promotion focus scores on health outcomes were found, all  $ps \geq 0.141$ .<sup>2</sup>

These analyses also revealed country differences in two health outcomes. Specifically, participants from the US (vs. the UK) reported more preventive behaviours,  $p = 0.038$ , and greater anxiety,  $p = 0.011$ , during the COVID-19 pandemic.

### 4.3 | Exploratory analyses

Based on our previous analyses, the exploratory mediation model controlled for country differences in preventive behaviours and anxiety. As shown in Figure 1, standardized results showed that prevention focus predicted more perceived risks,  $p < 0.001$ , more worry about contracting COVID-19,  $p < 0.001$ , and higher frequency of preventive behaviours enactment,  $p < 0.001$ . Results also showed that perceived risk was associated with higher anxiety,  $p < 0.001$  (indirect effect:  $\beta = 0.07$ ,  $p < 0.001$ ), and less perceived physical



**FIGURE 1** Standardized Regression Coefficients ( $\beta$ ) for the Exploratory Mediation Analysis. Dashed lines indicate non-significant paths. \* $p < 0.050$ ; \*\* $p < 0.010$ ; \*\*\* $p < 0.001$

health,  $p = 0.040$  (indirect effect:  $\beta = -0.05$ ,  $p = 0.040$ ). Worry about contracting COVID-19 was also associated with higher anxiety,  $p < 0.030$  (indirect effect:  $\beta = 0.05$ ,  $p = 0.030$ ), but not with perceived physical health,  $p = 0.480$ . Notably, frequency of preventive behaviours enactment became associated with less anxiety,  $p = 0.050$  (indirect effect:  $\beta = -0.06$ ,  $p = 0.050$ ), and no association emerged for perceived physical health,  $p = 0.110$ .

## 5 | DISCUSSION

Past research has shown that individual motivations for security or growth are important to understand health behaviours (Zou & Scholer, 2016). Some findings have already shown that people more focussed on prevention (vs. promotion) engage in more health-protective behaviours in different domains (Avraham et al., 2016; Ferrer et al., 2017; Fuglestad et al., 2013; Rodrigues et al., 2019, 2020; Zou & Scholer, 2016). At the same time, they are less concerned about infections (Rodrigues, Lopes, & Carvalho, 2021). Aligned with this, people more motivated to maintain their safety were less anxious and less fearful during the COVID-19 pandemic (Luo et al., 2020; Rodrigues, 2021). We addressed these apparently contradictory findings by examining if regulatory focus influenced different perceptions and health outcomes during the COVID-19 pandemic. In the current study, we used data from before the COVID-19 pandemic—intended to examine the temporal effects of regulatory focus on sexual behaviour—and built upon those results by assessing different health outcomes during the pandemic. This allowed us to examine the temporal effects of regulatory focus on perceptions (e.g., worry about infection), behaviours (e.g., adhere to social isolation), and psychological symptomatology (e.g., anxiety due to the pandemic).

Our findings supported the notion that regulatory focus in sexuality is relatively stable over time (Gödöllei & Beck, 2020) by providing evidence of the measure's temporal stability, considering the full scale at T1 and the same items of the predictor variable in

both waves of the survey. Results also provided evidence of predictive and convergent validity by showing that scores on regulatory focus in sexuality were associated with scores on a measure of general regulatory focus later on. This suggests that our predictor variables can also help understand individual functioning and well-being later on, even though scores on both sexuality and general prevention focus were uncorrelated at T2.

Our findings also showed that having a predominant focus on prevention (vs. promotion) predicted more risk perceptions, more worry about contracting COVID-19, and more protective behaviours (e.g., washing hands more frequently). This is aligned with other studies showing that being more focussed on prevention (vs. promotion) helps people to enact health-protective behaviours (Avraham et al., 2016; Ferrer et al., 2017; Fuglestad et al., 2013; Rodrigues et al., 2020), arguably because these people perceive more threats to their health (Rodrigues et al., 2019). Furthermore, our findings complement recent research showing associations between regulatory focus, fear of COVID-19 infection, and perceived pandemic-related threats (Rodrigues, 2021; Rodrigues, Balzarini, et al., 2021). If people more focussed on prevention are more aware of the risks a given context poses to their health, they should activate different coping mechanisms that can help them control health risks and avoid threats, and consequently experience psychological and physical well-being. This can include seeking more objective information about what they need to do to protect their health and have greater control over their behaviours. Aligned with this reasoning, our exploratory mediation analysis showed that having a predominant focus on prevention increased perceived risks related to the pandemic and more worry about infection, which increased anxiety and decreased perceived physical health (only for perceived risk). However, and in contrast with the overall correlations between T2 variables, enacting more protective behaviours during the pandemic seemed to have helped individuals more focussed on prevention become less anxious about the pandemic. All things considered, then, these findings show that acting in accordance with one's safety concerns helps people when faced with health threats, and highlight



distinct paths through which prevention focus impacts the fear of COVID-19 infection and psychological and physical well-being.

These longitudinal effects remained significant even after accounting for perceived life satisfaction before the pandemic and for country of residence. Worth of notice, people from the USA engaged more frequently in preventive behaviours and were more anxious due to the COVID-19 pandemic than their UK counterparts. These differences are likely attributable to the evolution of the pandemic in both countries at the time of the study (World Health Organization, 2020).

## 5.1 | Limitations and future studies

Our findings present novel data by highlighting the crucial role of regulatory focus in health and well-being at the onset of the pandemic. However, these findings should be taken with caution in light of some limitations. Our main predictor variables were focussed on sexuality, which can limit the generalization of our findings because we were unable to control for the effect of general regulatory focus at baseline. Similar to our results, past findings have shown correlations between regulatory focus in specific domains (e.g., health) and general regulatory focus (e.g., Ferrer et al., 2017). Also, our temporal effects remained the same even after controlling for general regulatory focus at T2. Arguably, we would have observed even stronger effects if we had assessed health or general regulatory focus at baseline. We also acknowledge limitations to our theoretical rationale due to inconsistencies in the measurement of regulatory focus across waves and the lack of correlation between prevention scores assessed at T2. This may be explained by validity or reliability issues associated with the use of single-item measures used in this wave or, more likely, by changes in the context. Indeed, the onset of the pandemic caused an overall decline in sexual activity (e.g., Lehmillier et al., 2021; Wignall et al., 2021), suggesting that sexual security goals were not necessarily motivating behaviours when compared to general security goals. Notwithstanding, we must also note that our regression models used T1 measures—assessed before the pandemic—as our predictor variables.

We also conducted exploratory mediation analyses with data from a two-wave longitudinal study and found a potential path through which regulatory focus helped people cope with the pandemic—enacting preventive behaviours. Some authors have questioned the adequacy of such analyses with a two-wave study (Cole & Maxwell, 2003) and therefore our findings must be taken with caution. Still, all outcomes were assessed at the second wave, were interdependent of one another, and were highly determined by the context. Building upon these exploratory findings, future studies should seek to replicate our findings with a fully longitudinal design (e.g., a three-wave study), add more complete measures of regulatory focus, disentangle the predictive value of each regulatory focus domain to different health outcomes and health behaviours, and explore the specific contribution of perceptions and behaviours to psychological and physical well-being in health-threatening contexts.

We were unable to examine the extent to which local policies and government restrictions specific to each country impacted how participants experienced the COVID-19 pandemic. For example, participants in the USA were likely to be more anxious than people in the UK due to an increased number of new infections and deaths caused by the COVID-19 (World Health Organization, 2020). However, this experience might have been more evident in states or cities with a higher number of infections and deaths or with more (vs. less) restricted social confinement policies. Future research should seek to examine how these policies and restrictions modulated individual motivations for security and, consequently, their perceptions and behaviours during this pandemic. Lastly, we have no information on how people who were more focussed on promotion were coping with the pandemic. We found no significant associations between a predominant focus on promotion and either indicator of individual function or well-being. However, this can mean that some of these people were not taking more risks or having more difficulties coping with the pandemic, while others had opposite behaviours and experiences. Drawing from research showing that promotion focus is associated with risk-taking in sexual health and dealing with the consequences afterward (Rodrigues, Lopes, & Carvalho, 2021), one possibility is determining if these people were more likely to take risks and get tested for COVID-19 more frequently. Future studies should explore variables that can help explain this lack of associations and account for personal history with COVID-19 (e.g., having been diagnosed with COVID-19, knowing someone diagnosed, frequency of testing). Lastly, and even though we had some diversity in our sample, this was not a representative sample, and therefore results should be taken with caution. Future studies should seek to have more heterogeneous samples of participants (e.g., include people with different gender and sexual identities, people from different race/ethnic backgrounds, and people from different socio-economic statuses) to increase the generalizability of our findings.

## 6 | CONCLUSION

This longitudinal study provided new and important insights to the literature on the COVID-19 pandemic and highlighted prevention focus as a unique contributor to health outcomes in this particular context. In a sample of people from the UK and the USA, being motivated by security (vs. growth) before the COVID-19 pandemic heightened health risks helped people have better coping strategies, motivated them to act accordingly, and fostered well-being during the pandemic. Overall, our findings are critically important to our understanding of individual motivations for public health crises and contributed to clarify why some people are more (or less) prone to risks in this context. Given that regulatory focus shapes health behaviours in different domains, our findings can also be extended to inform how people cope and function in their daily lives (e.g., Miller & Markman, 2007; Woltin et al., 2018) and potentially inform the development of health communication and awareness campaigns aimed at fostering public health. For example, campaigns should strive to have specific communications to people who have a predominant focus on

prevention by highlighting the risks of a given context and fostering health-protective behaviours and the positive health and well-being benefits of enacting protective behaviours. For people with a predominant focus on promotion, this type of communication may not be the most efficient and should highlight different factors that are yet to be determined.

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## CONFLICT OF INTEREST

No potential conflict of interest was reported by the authors.

## ETHICS STATEMENT

This study was approved by the Ethics Committee at Iscte-Instituto Universitário de Lisboa (#55-2020).

## AUTHORS CONTRIBUTIONS

David L. Rodrigues conceived and coordinated the study, performed the measurement and statistical analysis, interpreted the data, and drafted the manuscript; Diniz Lopes and Rhonda N. Balzarini participated in the study design and helped to draft the manuscript. All authors read and approved the final manuscript.

## DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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## ENDNOTES

<sup>1</sup> Additional correlation analyses between regulatory focus items showed significant correlations between the same item assessing prevention focus in sexuality at T1 and T2,  $r = 0.35, p < 0.001$ , and with the general prevention focus item at T2,  $r = 0.28, p < 0.001$ . Similarly, there were significant correlations between the same item assessing promotion focus in sexuality at T1 and T2,  $r = 0.29, p < 0.001$ , and with the general promotion focus item at T2,  $r = 0.19, p = 0.015$ .

<sup>2</sup> Exploratory analyses showed the same results for models that did not include the covariates, and for models additionally controlling for general regulatory focus at T2.

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