RESEARCH ARTICLE

Path analysis from COVID-19 perceptions to psychological health: The roles of critical distance and mastery

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Abstract

Objective: The Coronavirus disease 2019 (COVID-19) pandemic was previously associated with psychopathological symptoms. However, the psychological mechanisms underlying these associations are largely unexplored. Previous studies suggested associations between metacognitive abilities (e.g., mastery) and symptomatology, which may have impacts on COVID-19 perceptions. This study aims to explore, using path analysis, the mediational role of Critical Distance (differentiation and decentration abilities) and Mastery on the relationships between COVID-19 perceptions and psychological well-being and distress.

Methods: In a cross-sectional design, 227 participants ($M = 34.21$, $SD = 10.9$) filled self-report questionnaires.

Results: Metacognitive abilities were negatively correlated with psychopathological symptoms. Both Critical Distance and Mastery mediated the path from COVID-19 perceived severity and anxiety to psychological distress and well-being. Critical Distance seems to augment Mastery which tends to increase psychological well-being and limited psychological distress.

Conclusions: Metacognition seems to play a mediational role on the relationship between COVID-19 perceptions and mental health. Clinical psychologists and psychotherapists may enhance psychological interventions regarding COVID-19 psychopathological symptomatology by working on metacognitive Critical Distance and Mastery abilities.

KEYWORDS
COVID-19 perceptions, Critical Distance, Mastery, Metacognition, Symptomatology

1 | INTRODUCTION

Despite the new advances in vaccination in several countries, the Coronavirus disease 2019 (COVID-19) pandemic is still a threat to physical and mental health worldwide. It was declared on 11 March of 2020 a worldwide pandemic by the World Health Organization (WHO, 2020a) and caused millions of deaths worldwide (WHO, 2020b). Thus, it is imperative to continue to uncover the psychological mechanisms underlying COVID-19 perceptions and psychopathological symptoms,

to enhance psychological interventions (Faustino, Branco Vasco, Delgado, Farinha-Fernandes, & Guerreiro, 2021; Faustino et al., 2022; Prout et al., 2020). While previous studies documented associations between psychopathological symptoms and the COVID-19 pandemic (Faustino, Branco Vasco, Delgado, Farinha-Fernandes, & Guerreiro, 2021; Conversano et al., 2020; Lee & Crunk, 2020; Qiu et al., 2020; Salari et al., 2020; Silva Moeira et al., 2021), the search for underlying psychological mechanisms is still sparse. The study of these associations (COVID-19 risk and perceptions with mental

health) was conducted in several countries and some examples may be given.

Jia et al. (2020) described a significant increase in anxiety, stress, and depression levels in a community cohort study when comparing with population norms in the United Kingdom (UK). Also in the United Kingdom, Shevlin et al. (2020) documented that anxiety/depression and trauma symptoms were predicted by a young age, presence of children in the household, high estimates of personal risk and low/lost income. Daly and Robinson (2021), using the National Health Interview Survey (NHIS; $N = 30,915$), described that anxiety symptomatology increased during the onset of COVID-19 and lowered quickly as stay-at-home orders were lifted in the United States of America (USA). Faustino, Branco Vasco, Delgado, Farinha-Fernandes and Guerreiro (2021) documented associations between loneliness and symptomatology and the mediational role of psychological well-being and distress in these relationships in Portugal. In another study by Faustino, Branco Vasco, Delgado, Farinha-Fernandes, Guerreiro, and Matos (2021), several associations between symptomatology and COVID-19 perceptions were described, wherein COVID-19 anxiety correlated positively with somatization, anxiety, phobic anxiety, paranoid ideation and psychological distress. Zhang et al. (2021) documented an increase in cases with post-traumatic stress disorder (PTSD) in the general population. Furthermore, higher levels of psychological distress were associated with increasing number of days in lockdown in Italy (Conversano et al., 2020). Finally, several authors also point out the relationships between quarantine measures and the increasing levels of anxiety, stress, depression, fear of death, and cognitive difficulties (Banerjee, 2020; Brooks et al., 2020; Dickerson, 2020; Hiremath et al., 2020; Silva Moeira et al., 2021; Wang et al., 2017; Zandifar & Badrfam, 2020). Based on these evidences, the association between COVID-19 perceptions and mental health becomes clear. This association seems to be stable and consistent across different studies. Therefore, as previously stated, it is also extremely important to start exploring the psychological variables underlying this association.

Metacognition is a generic term used to define clusters of higher-order psychological and neuropsychological abilities associated with the mental processing of one's and others' internal variables (Faustino, Branco Vasco, Oliveira, et al., 2021; Semerari et al., 2003). It enables humans to understand one's own and the others' states of mind, core beliefs, wishes, intentions, and behaviours (Dimaggio et al., 2007, 2015; Pedone et al., 2017). According to the Metacognitive Multi-Function Model (MMFM, Semerari et al., 2003), metacognition encompasses the abilities of (1) monitoring, (2) differentiation, (3) integration, (4) decentration, and (5) mastery, divided into four factors: self-self, self-other, decentration, and mastery. In the empirical study by Pedone et al. (2017), who developed a self-report measure of metacognition (the MSAS, as further described in the Section 2), a four-factor structure was described: (1) Self-Reflectivity (clustering the abilities of monitoring and integration; (2) Critical Distance (clustering differentiation and decentration); (3) Understanding Other Minds; and (4) Mastery. This structure was replicated by Faustino, Branco Vasco, Oliveira, et al. (2021).

Key Practitioner Message
- COVID-19 pandemic is associated with psychopathological symptoms.
- Metacognition plays a sequential and mediating role in the relationship between COVID-19 perceptions and mental health.
- COVID-19 psychopathological symptoms may be reduced by augmenting Critical Distance (differentiation and decentration) and Mastery abilities.

Previous studies have associated metacognitive impairments with anxiety and depression (Capobianco et al., 2020), emotional disorders (Wells, 2000), personality disorders (Dimaggio et al., 2007, 2015), schizophrenia (Dimaggio & Lysaker, 2010), difficulties in affect regulation (Harder & Folke, 2012), poor social functioning (Bo et al., 2015), autism spectrum disorders (Grainger et al., 2014), learning disabilities (Lucangeli et al., 1998), executive dysfunctions (Lysaker et al., 2008), and neurocognitive impairment (Nicolo et al., 2012). Moreover, this evidence suggests that metacognition (critical distance and mastery) may play a pivotal role in processing internal and external information regarding self and others. Nevertheless, these variables were not studied in the pandemic context.

Critical Distance, as a single metacognitive factor in the MSAS clustering differentiation and decentration (Pedone et al., 2017); encompasses *all the subfunctions relating to ability to distance oneself from one's thoughts: (a) recognition of the representational nature of thought; (b) recognition that mental representations are not objective images of external reality; (c) recognition that one's own and others' beliefs may be false, and (d) recognition that others can have different points of view and beliefs* (p. 190, Pedone et al., 2017). The ability to distance oneself from one's thoughts and evaluate them critically (critical distance, as opposed to cognitive fusion) may be regarded as one of the most fundamental abilities of metacognition and psychological flexibility, being considered a transdiagnostic construct associated with emotion variables (Bernstein et al., 2015; Faustino, Branco Vasco, Farinha-Fernandes, et al., 2021; Faustino, Branco Vasco, Oliveira, et al., 2021). From this perspective, it may be viewed as an universally adaptive ability. Nevertheless, contexts may play a role in the adaptiveness of metacognitive abilities. According to Bernstein et al. (2015), the ability to distance oneself from distressing thoughts, situations, and maladaptive automatic behaviours may become maladaptive if an individual is distant and detached in a situation that requires him to stay focused and to process it adequately. In this way, an individual may avoid, overcompensate, transform, and/or dismiss an important theme that needs to be processed accordingly. For instance, individuals may distance themselves from a COVID-19 distressful appraisal without generating an alternative, adaptive appraisal. According to Bernstein et al. (2015), this may also be maladaptive regarding fear extinction learning (Foa & Kozak, 1986). Nevertheless, these are empirical

questions that are still unexplored (Aldao & Nolen-Hoeksema, 2012; Bernstein et al., 2015; Sheppes et al., 2011).

As a different metacognition construct, mastery reflects the ability to use mental content and knowledge about the self, others, and the world in complex decision-making, problem-solving and coping with emotional suffering (Semerari et al., 2003). It refers to the ability to process and to use mental contents as an adaptive strategy to develop adequate decision-making and contextually focused problem-solving that enables individuals to deal with distressful thoughts and appraisals. On the one hand, adequate levels of mastery seem to be associated, for example, with physical and mental health (O'Kearney et al., 2020) and adaptive functioning in the therapeutic relationship (Parolin et al., 2017). On the other hand, poor levels of mastery are associated with higher levels of anxious attachment (Outcalt et al., 2016), personality disorders (Carcione et al., 2011; Dimaggio et al., 2007, 2015), cognitive fusion (Faustino, Branco Vasco, Oliveira, et al., 2021) and schizophrenia (Lysaker et al., 2011).

In sum, based on the aforementioned evidence, metacognitive abilities (especially Critical Distance [differentiation and decentration] and mastery) may play a sequential mediational role on the relationship between COVID-19 perceptions (severity and anxiety) and mental health, namely, in psychological well-being and distress. The investigation of this assumption is the main goal of this study.

1.1 | Hypotheses

Path analyses with metacognitive Critical Distance (decentration and differentiation) and mastery are absent in the scientific literature. It can be hypothesized that Critical Distance and Mastery are significant variables in the relationships between COVID-19 perceptions and mental health. Four path analyses are hypothesized, from COVID-19 perceptions (anxiety and severity) to psychological well-being and psychological distress, with two sequential mediational roles of Critical Distance (differentiation and decentration abilities) and Mastery. It is assumed that Critical Distance may be embedded in Mastery because it is conceptualized as a low-level core metacognitive ability, while Mastery may be viewed as a higher-level metacognitive ability. Thus, Semerari et al. (2003) stated that "... *Mastery Basic Requirements (MBR) refers to the ability to define problems in plausible psychological terms. Mastery strategies can be divided into separate categories according to the complexity of the metacognitive operations involved.*" (pp. 10). The authors imply a gradation of complexity (with levels of complexity), wherein the third level strategies are defined as: *"Third level strategies (MS3) require a high level of reflection effort. They include adopting a rational and critical attitude to the beliefs that are behind a problematic state, using one's knowledge about others' mental states to regulate interpersonal problems and accepting in a mature way one's personal limits when trying to master oneself or influence events."* (Semerari et al., 2003, pp. 11). Therefore, it is plausible to assume that to be critical and to be rational towards different problems and to generate different regulation modes implies the allocation of abilities related to Critical Distance. This notion is well represented in the items

composing the mastery scale of the MSAS (Faustino, Branco Vasco, Oliveira, et al., 2021; Pedone et al., 2017), which we adopt in this study. Therefore, based on prior theorizations, the following hypotheses arise:

1. All metacognitive dimensions (according to MSAS) are positively correlated with psychological well-being and negatively correlated with psychological distress and symptomatology;
2. All metacognitive dimensions (according to MSAS) are negatively correlated with COVID-19 anxiety and perceived COVID-19 severity;
3. Critical Distance and Mastery abilities mediate the relationship between COVID-19 anxiety with psychological distress and well-being;
4. Critical Distance and Mastery abilities mediate the relationship between perceived COVID-19 severity with psychological distress and well-being.

2 | METHODS

2.1 | Participants and procedures

The sample consisted of 227 participants, 53 males (23.3%) and 174 females (76.7%), with ages varying from 18 and 72 years ($M = 34.21$, $SD = 10.9$). Participants were recruited from the general population, with inclusion criteria as follows: to be older than 18 years and younger than 90, to be in self-quarantine for more than 15 days, and not having a major neurocognitive disorder.

A small text with an invitation to participate was disseminated through social media (e.g., Facebook and LinkedIn), accompanied by a link to an online questionnaire built using the Qualtrics platform. By following the link, an informed consent form and a description of the study were presented, which subjects should read and accept prior to participation. Individuals could complete our online protocol in the period between 20 April and 20 of May of 2020, having 6 days to finalize it after initiating. Participation was voluntary, and no compensation was offered. This study was approved by the ethics committee of the Faculty of Psychology of the University of Lisbon.

During the data collection period, Portugal was under severe quarantine measures, which included legislated obligatory confinement to individuals who were infected or ill with COVID-19 and individuals from risk groups (e.g., chronic diseases and older adults). There were restrictions on public circulation, commerce, and other cultural or religious activities, with telework becoming mandatory when possible.

2.2 | Measures

2.2.1 | COVID-19 Inventory (COV19-I)

The COV19-I (Faustino, Branco Vasco, Delgado, Farinha-Fernandes, Guerreiro, & Matos, 2021) is a self-report measure focused on the

assessment of COVID-19 anxiety (regarding the pandemic situation and the possibility of contagion) and COVID-19 perceived severity (i.e., beliefs about the seriousness and the dangerousness of being infected by SARS-CoV-2 and developing COVID-19). It is composed by eight items that use a 6-point Likert Scale (1 = totality disagree and 6 = totally agree), in which individuals rate themselves according to their experience. Higher scores indicate higher levels of COVID-19 related anxiety and perceived severity. Cronbach's alpha for COVID-19 anxiety ($\alpha = 0.76$) and COVID-19 perceived severity ($\alpha = 0.87$) were considered adequate.

2.2.2 | Metacognition Self-Assessment Scale (MSAS)

The MSAS (Pedone et al., 2017; Portuguese version by Faustino, Branco Vasco, Oliveira, et al., 2021) is a self-report measure focused on the assessment of several metacognitive abilities (monitoring, differentiation, integration, decentration, and mastery). Its factorial structure identifies that these different subfunctions are grouped in four different factors: Self-Reflectivity (monitoring and integration), Critical Distance (differentiation and decentration), Understanding Other Minds, and Mastery. It has 18 items that are scored on a 5-point Likert scale (1—never to 5—always). High scores indicate better metacognitive self-evaluation on metacognitive abilities. Cronbach's alpha for the subscales ranged from 0.64 in Mastery to 0.73 in Critical Distance which was considered adequate.

2.2.3 | Mental Health Inventory (MHI)

The MHI (Ware et al., 1979, Portuguese version by Ribeiro, 2001) is a self-report instrument used to assess psychological well-being and psychological distress. It is composed by 38 items that are rated on a 6-point Likert scales (1 = never to g = always). Cronbach's alphas for psychological well-being ($\alpha = 0.80$) and psychological distress ($\alpha = 0.86$) were considered good.

2.2.4 | Brief Symptom Inventory (BSI-53)

The BSI-53 (Degoris, 1993, Portuguese version by Canavarro, 1999) is used to assess specific psychopathological symptoms (e.g., interpersonal sensitivity, depression, or anxiety) and also includes an informative general factor. It is also a self-report inventory, with 53 items rated on a 5-point Likert scale (0—never, to 4—many times). Cronbach's alpha for the total index was considered very high ($\alpha = 0.97$).

2.3 | Data analyses

IBM SPSS version 24 was used for all statistical analyses. Descriptive statistics were used to describe the sample, and normal distribution was assumed (estimated through skewness and kurtosis analyses; see the Results section). To perform path analysis, the macro process for SPSS (Hayes, 2013) was used. For a power analysis of 0.80 for indirect effects, a sample size of 113 individuals was required (power analysis was calculated using the MedPower software; Kenny, 2017). Since our sample size was of $N = 227$, it was considered adequate to perform the path analysis. Confidence intervals of 95% and 10,000 bootstrap computations were used in the four mediations (Table 1).

3 | RESULTS

Table 2 describes means, standard deviations, minimum, maximum, asymmetry, and kurtosis of the metacognitive dimensions (Self-Reflectivity involving monitoring and integration, Critical Distance involving differentiation and decentration, Understanding Other Minds, and Mastery, from the MSAS), COVID-19 anxiety and severity (COV19-I), psychological distress and well-being (MHI), and Psychopathological Symptoms (BSI-53).

Table 3 describes the correlational analysis between metacognitive dimensions (Self-Reflectivity, Critical Distance, Understanding Other Minds, and Mastery) and COVID-19 anxiety, COVID-19 severity, psychological distress and well-being and psychopathological symptoms. The Self-Reflectivity domain, which clusters the abilities of monitoring and integration, correlated positively with COVID-19 severity ($r = 0.17$, $p < 0.01$) and negatively with psychological distress ($r = -0.20$, $p < 0.01$) and psychopathological symptoms ($r = -0.36$, $p < 0.01$). The Understanding Other Minds domain correlated positively with COVID-19 anxiety ($r = 0.19$, $p < 0.01$) and severity ($r = 0.21$, $p < 0.01$) and negatively with psychopathological symptoms ($r = -0.23$, $p < 0.01$); see Table 3.

Figure 1 describes the path analysis from COVID-19 anxiety to psychological well-being, with Critical Distance (clustering differentiation and decentration) and Mastery as sequential mediators. Full arrows represent significant regressions, while traced arrows represent nonsignificant regressions. Regression standardized coefficients are displayed near the arrows. The model did not have empirical support, with the mediational effect not being statistically significant ($b = 0.01$;| -0.01; 0.03|, $p > 0.05$).

Figure 2 describes the path analysis from COVID-19 anxiety to psychological distress, with Critical Distance and Mastery as sequential mediators. The model did not have empirical support, with the mediational effect not being statistically significant ($b = -0.01$,| -0.03; 0.01|, $p > 0.05$).

Figure 3 describes the path analysis from COVID-19 severity to psychological well-being, with Critical Distance and Mastery as sequential mediators. The complete model did not have full empirical support, however, the mediational indirect effect was statistically significant ($b = 0.02$,| 0.01; 0.05|, $p < 0.05$).

Figure 4 describes the path analysis from COVID-19 severity to psychological distress, with Critical Distance and Mastery as sequential mediators. The complete model did not have full empirical support, however, the mediational indirect effect was statistically significant ($b = -0.01$,| -0.04; -0.01|, $p < 0.05$).

TABLE 1 Descriptive statistics

	n	%	M	SD	Amp	Min-Max
Days in self-imposed quarantine	227	100	47.3	12.0	85	5–90
Age	227	100	34.21	10.9	54	18–72
Gender						
Men	53	23.3				
Women	174	76.7				
Educational level						
<9 years	3	1.3				
Secondary	32	14.1				
Bachelor's degree	94	41.4				
Master's degree	92	40.5				
Doctoral degree	6	2.6				
Occupation						
Working	35	15.4				
Telework	77	33.9				
Lay-off	17	7.5				
Unemployed	32	14.1				
Student	51	22.6				
Student/worker	8	3.5				
Retired	7	3.0				
Marital STATUS						
Single	131	57.7				
Married	43	18.9				
Nonmarital partnership	35	15.4				
Divorced	17	7.5				
Widow	1	0.4				
Psychological treatment						
Yes	27	11.9				
No	200	88.1				
Self-reported diagnosis						
Yes	10	4.4				
No	17	7.5				

TABLE 2 Descriptive statistics of the variables under study

	M	SD	Min	Max	Asymmetry	kurtosis
Self-reflectivity	4.10	0.56	1.00	5.00	−0.902	3.413
Understanding other minds	4.52	0.58	1.00	5.00	−0.643	5.185
Critical distance	3.97	0.56	1.00	5.00	−0.583	2.677
Mastery	3.92	0.63	1.00	5.00	−0.688	1.538
COVID-anxiety	4.16	1.10	1.00	6.00	−0.471	−0.228
COVID-severity	4.61	1.10	1.00	6.00	−0.669	0.119
Psychological distress	2.83	0.56	1.00	4.67	0.387	0.857
Psychological well-being	4.90	0.92	1.50	7.00	0.002	0.439
Psychopathological symptoms	0.84	0.62	0.00	3.30	1.105	1.064

4 | DISCUSSION

The present study aimed to explore the relationships between meta-cognition and COVID-19 perceptions (severity and anxiety) and mental health. Results were challenging to interpret and required taking a deep look at the specificities of each construct.

Hypothesis 1 was partially confirmed, since not all metacognitive dimensions were positively correlated with psychological well-being

TABLE 3 Correlations between the variables under study

	COVID-19 anxiety	COVID-19 severity	Psychological distress	Psychological well-being	Psychopathological symptoms
Self-reflectivity	0.02	0.17**	−0.20**	0.08	−0.36**
Understanding Other minds	0.19**	0.21**	−0.13	0.01	−0.23**
Critical distance	0.10	0.20**	−0.02	−0.15*	−0.14**
Mastery	0.02	0.15*	−12**	0.06	−0.38**
Psychopathological symptoms	0.16*	0.02	0.49**	−0.37**	-

*p < 0.05. **p < 0.01.
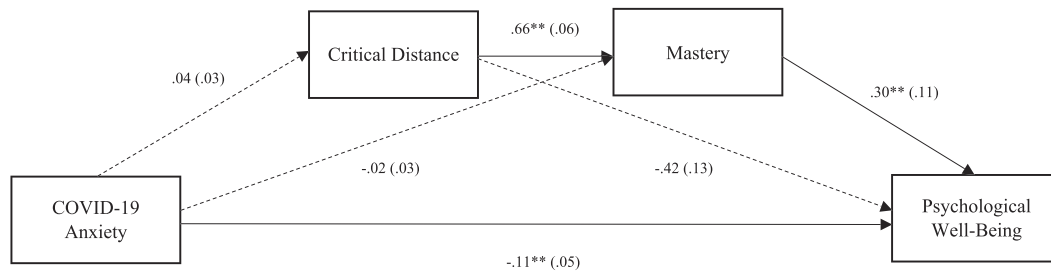
FIGURE 1 Path analysis from COVID-19 anxiety to psychological well-being, with Critical Distance (clustering differentiation and decentration) and Mastery as mediators (*Note*** = *p* < 0.01). Critical Distance (clustering differentiation and decentration)
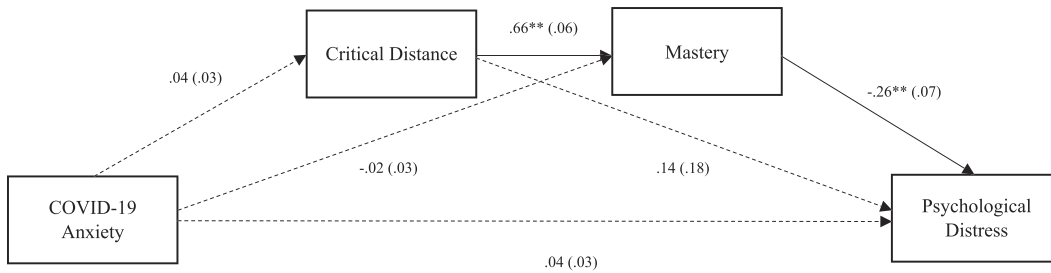

FIGURE 2 Path analysis from COVID-19 anxiety to psychological distress, with Critical Distance (clustering differentiation and decentration) and Mastery as significant mediators (*Note*** = *p* < 0.01)
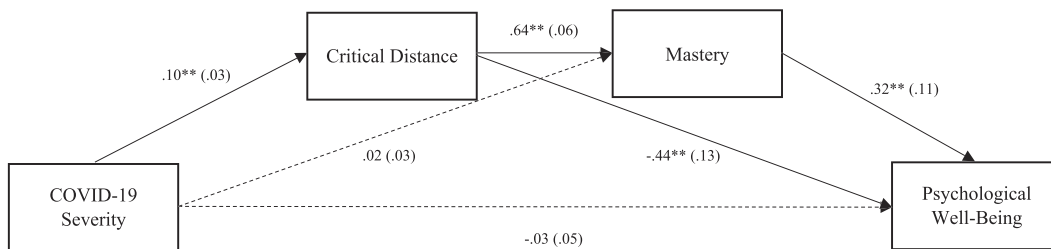

FIGURE 3 Path analysis from COVID-19 severity to psychological well-being, with Critical Distance (clustering differentiation and decentration) and Mastery as significant mediators (*Note*** = *p* < 0.01)

and negatively correlated with psychological distress and symptomatology. Self-Reflectivity and Mastery negatively correlated with psychological distress, which shows an association between the lack of abilities to understand one's own beliefs, needs, motivations, and decision-making with psychological distress. If an individual has

difficulties understanding his mind, it is plausible that he/she will have difficulties in applying information about the self to solve complex problems and to guide an adequate decision-making process. This is what happens in individuals with personality disorders, schizophrenia, and poor social functioning, because they cannot understand their
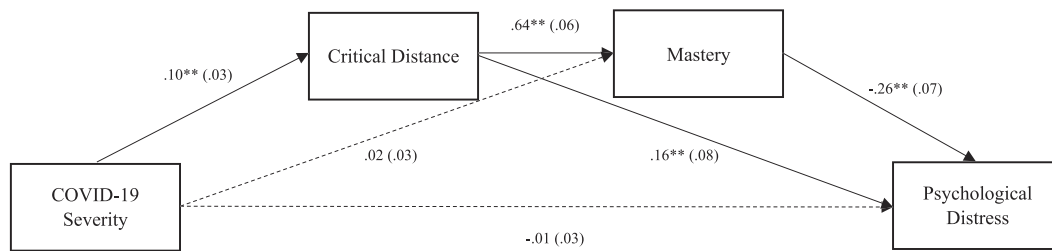
FIGURE 4 Path analysis from COVID-19 severity to psychological distress, with Critical Distance (clustering differentiation and decentration) and Mastery as significant mediators (*Note*** = *p* < 0.01)

psychological functioning, which impairs how they relate with others (Bo et al., 2015; Dimaggio & Lysaker, 2010; Dimaggio et al., 2007, 2015). Critical Distance (involving differentiation and decentration) was negatively correlated with psychological well-being, which was unexpected. However, the understanding of these surprising results may be related to the idea of an inflexible "use" of metacognitive distancing abilities (Critical Distance), as suggested by Bernstein et al. (2015). If an individual needs to stay focused on one stressful/meaningful situation to understand, reflect and generate an adaptive strategy to cope with it, but instead he/she is using distancing abilities to avoid processing the situation, a decrease in the levels of psychological well-being may result. Nevertheless, all metacognitive domains correlated negatively with psychopathological symptomatology, which supports previous assumptions according to which poor Self-Reflectivity, Critical Distance, Understanding Other Minds, and Mastery abilities facilitate a wide array of symptomatology (Bo et al., 2015; Capobianco et al., 2020; Dimaggio & Lysaker, 2010; Dimaggio et al., 2007; Semerari et al., 2003).

Hypothesis 2 was refuted, since not all metacognitive dimensions were negatively correlated with COVID-19 anxiety and COVID-19 perceptions. In fact, the correlational pattern was the opposite of what was expected, and only Understanding Other Minds correlated with COVID-19 anxiety. COVID-19 anxiety and COVID-19 severity reflect two different aspects of COVID-19 perceptions, wherein the first may be viewed as the emotional side and the latter as the cognitive side (Faustino, Branco Vasco, Delgado, Farinha-Fernandes, Guerreiro, & Matos, 2021). In this sense, one may understand why metacognition correlated more with perceived COVID-19 severity. The inverted correlational pattern may also be explained by the "awareness" aspect of the metacognitive abilities since they may be associated with developing perceptions about the self and the world. Individuals need to be aware of their psychological functioning to understand themselves and to apply metacognitive abilities (e.g., differentiation) accordingly. In this sense, adequate metacognitive skills may contribute to the estimation of the perceived severity of COVID-19. One may also speculate that individuals with lower metacognition have more propensity to adhere to extreme forms of conspiracy thinking, thus perceiving lower severity of COVID-19.

Hypothesis 3 was refuted. The first two models from COVID-19 anxiety to psychological distress and well-being, with Critical Distance and Mastery as sequential mediators, were not statistically significant.

One likely explanation is similar to the one mentioned for the previous hypothesis. If COVID-19 anxiety represents the emotional aspect of COVID-19 perceptions, then understandably, a path may be hard to be traced from it with metacognitive abilities. Metacognitive abilities and cognitive contents may not interact in the same way on mediational processes regarding COVID-19 anxiety and mental health. This can be ilustrated in the following example. Faustino et al. (2022), showed that early maladaptive schemas of vulnerability to harm and illness and mistrusfulness are significant mediators of the relationship between COVID-19 anxiety and psychological well-being. Probably, cognitive-affective schemas with dysfunctional contents, such as vulnerability, distrust and pessimism, are likely be more associated with COVID-19 anxiety, rather that metacognitive abilites (e.g., critical distance and mastery), due to biased information processing resulting from schematic content. Therefore, this study suggests that maladaptive schemas (cognitive contents rather that cognitive abilities) may play a significant role in mediations between COVID-19 anxiety and mental health. Nevertheless, Critical Distance predicted Mastery, which in turn predicted both psychological distress and well-being. Moreover, the significant direct negative path from COVID-19 anxiety to well-being also suggests that COVID-19 anxiety reduces well-being levels, which is consistent with previous findings (Faustino, Branco Vasco, Delgado, Farinha-Fernandes, & Guerreiro, 2021; Faustino, Branco Vasco, Delgado, Farinha-Fernandes, Guerreiro, & Matos, 2021).

Hypothesis 4 was confirmed, because Critical Distance and Mastery mediated the relationship between COVID-19 perceptions with psychological distress and well-being. According to the proposed model, abilities such as Critical Distance and Mastery are significant in the estimation of COVID-19 severity, which in turn contributes to psychological distress and well-being. Nevertheless, the direct path from COVID-19 severity to psychological distress was not significant, which means that COVID-19 severity by itself does not explain psychological distress and well-being in the study sample. Probably, the intensity of the estimation of COVID-19 perceptions and the direct relationship with distress and well-being is mediated by the metacognitive abilities of differentiation, decentration and mastery. In other words, the estimation of COVID-19 severity may be adaptive if individuals apply metacognitive abilities to guide problem-solving and to cope with psychological distress. A similar claim can be said relative to the direct path from COVID-19 severity to psychological well-being. Mastery abilities seem to be critical in these two mediations, on

the first model by predicting positively psychological well-being, and on the second model by predicting negatively psychological distress. Therefore, these results may be significant for psychological interventions focused on the promotion of metacognitive skills to deal with COVID-19 perceptions.

4.1 | Limitations and future directions

This study is inserted in a wider project that explored the impacts of the COVID-19 pandemic on mental health. It addressed some less studied topics during a particularly demanding and destabilizing pandemic period. Although using an online questionnaire allowed us to obtain a large sample of individuals and to capture participants' emotional states during this important period, some limitations of study can be identified, which can be considered in future studies. Specifically, this online study used a cross-sectional design, which may limit some causal explanations about the variables under study, and self-report measures are limited to individuals' self-awareness. The mediational role of Self-Reflectivity and Understanding Other Minds metacognitive domains was not explored, which should be explored in future studies.

Furthermore, other instruments measuring similar constructs have been used in recent studies, which can be combined with the ones used in this study in different protocols, in order to find additional support for the relationships described here and explore new ones (e.g., De Pasquale, Pistorio, et al., 2021; De Pasquale, Sciacca, et al., 2021, used the Fear of COVID-19 Scale to study the fear of contagion in relation to other variables). Finally, there is still a need for more studies regarding metacognition abilities and how they relate to other variables. Again, other instruments could be used in combination with the MSAS as it would be interesting to explore how these metacognitive domains relate to mood states, eating behaviour, or smartphone use (see, e.g., De Pasquale, Pistorio, et al., 2021; De Pasquale, Sciacca, et al., 2021).

5 | CONCLUSION

Critical Distance and Mastery play significant roles in the relationships between COVID-19 perceptions and mental health. More research is needed to replicate these findings. However, these results may enhance case conceptualization and clinical decision-making.

CONFLICT OF INTEREST
The authors declare that they have no conflict of interest

INFORMED CONSENT
Informed consent was obtained from all individuals.

ETHICS STATEMENT
Originality: This paper reflects and original unpublished scientific study. This study was revised and accepted by ethical commission of the Faculty of Psychology of University of Lisbon.

DATA AVAILABILITY STATEMENT
Data are not shared.

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