

## The Benefits of Group Identification for PhD Candidates' Health and Work

### *Os benefícios da identificação de grupos para a saúde e o trabalho dos candidatos ao doutorado*

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**ABSTRACT:** In line with the social cure literature, the present preregistered study aimed to test the extent to which group identification could have beneficial effects for PhD candidates, in particular by promoting their mental health, mitigating their feelings of imposture, and promoting their work. An online questionnaire was distributed to a convenience sample of 124 French PhD candidates and assessed participants' identification to the group of PhD candidates, psychological health (i.e., stress, anxiety, depression, burnout, obsessive passion), imposter thoughts, and work related variables expected to favor career success (i.e., self-efficacy, perceived competence, harmonious passion). As expected, group identification showed negative associations with stress, anxiety, depression, burnout, and obsessive passion. A contrario, group identification also showed positive associations with self-efficacy, perceived competence, and harmonious passion. However, no association was observed between group identification and imposter thoughts. Taken together, these results highlight the beneficial effects of social identification for PhD candidates' mental health and work. Theoretical and practical perspectives are discussed.

**Keywords:** Group identification, Social cure, health, work, Imposter syndrome, PhD candidates.

**RESUMO:** Em linha com a literatura de cura social, o presente estudo pré-registrado teve como objetivo testar até que ponto a identificação de grupos poderia ter efeitos benéficos para os candidatos ao doutorado, em particular ao promover sua saúde mental, mitigando seus sentimentos de impostura, e promover o seu trabalho. Um questionário online foi distribuído a uma amostra de conveniência de 124 candidatos ao doutorado franceses e avaliou a identificação dos participantes com o grupo de candidatos a doutorado, saúde

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psicológica (i.e., estresse, ansiedade, depressão, burnout, paixão obsessiva), pensamentos impostores e variáveis relacionadas ao trabalho que devem favorecer o sucesso na carreira (i.e., autoeficácia, competência percebida, paixão harmoniosa). Como esperado, a identificação do grupo mostrou associações negativas com estresse, ansiedade, depressão, burnout e paixão obsessiva. A contrário, a identificação do grupo também mostrou associações positivas com autoeficácia, competência percebida e paixão harmoniosa. No entanto, não foi observada associação entre a identificação do grupo e os pensamentos impostores. Em conjunto, estes resultados evidenciam os efeitos benéficos da identificação social para a saúde mental e o trabalho dos candidatos ao doutorado. São discutidas perspectivas teóricas e práticas.

**Palavras-chave:** Identificação de grupo; Cura social; Saúde; Trabalho; Síndrome do impostor; candidatos ao doutorado.

### Introduction

Modern societies face many challenges (e.g. climate change, poverty, famine, poor health, migration, war; United Nations). Researchers' capacity for innovation is an invaluable asset for tackling these societal problems. (e.g., European University Association). In this context, doctoral studies play a key role in the development of future innovations. Typically, doctoral programs aim to train PhD candidates to produce new knowledge, develop new services, organizations and technologies useful to the society as a whole (OECD, 2019, 2022). Thus, PhD candidates will contribute to meeting current and future societal and environmental challenges by making a substantial contribution to the social, technological and economic progress of our societies (Hazell et al., 2021).

Given the importance of doctoral studies in shaping progress and innovation, research into the psychosocial factors that are likely to impact PhDs' health and productivity remains crucial. Such research has currently highlighted a number of issues that seem particularly prevalent among PhD candidates, and likely to seriously weaken the innovative force these young researchers represent.

### **There is something rotten in the state of PhD**

PhD candidates tend to face many interrelated problems, including mental health issues, imposter thoughts, and negative perceptions of their abilities and of the quality of their work. More specifically, various health-related issues appear to be particularly prevalent among populations of PhD candidates globally, including stress, anxiety, depression, burnout, emotional difficulties, and suicidal ideation (e.g., Bonetto et al., 2023; Evans et al., 2018; Satinsky et al., 2021). Far from being a stable or improving issue, research indicates that the widespread and severe levels of stress and burnout in this population is on the rise (Levecque et al., 2017; Sorrel et al., 2020). This trend is especially visible among PhD candidates and young researchers (Kinman, 2001; Levecque et al., 2017).

In a meta-analysis of 16 studies representing 23,469 PhD candidates, Satinsky et al. (2021) estimated that the prevalence of clinically significant symptoms of depression was 24% (vs. 5 to 7% in the general population worldwide, and 13 to 15% among young adults in the US). These same authors also found, in a sample of nine studies including 15,626 PhD candidates, that the prevalence of clinically significant symptoms of anxiety was 17% (vs. 4% among young adults in the US). PhD candidates' mental health problems also tend to negatively impact their physical and social health (Rummell, 2015; Salzer, 2012). These health problems are therefore a growing concern for institutions and the scientific community worldwide (e.g., Hall, 2023; Nature, 2019 a,b; Woolston, 2019).

Related to these health outcomes, and linked to the organizational context, PhD candidates were also found to be particularly prone to imposter syndrome, defined as the persistent self-perception as an imposter (Kolligian & Sternberg, 1991; Leary et al., 2000). In fact, academia constitutes a work environment favoring imposter syndrome, particularly among PhD candidates (e.g., Van de Velde et al., 2019). Indeed, this

environment brings together several factors that can favor these imposter thoughts among PhD candidates. These last tend to experience performance pressure, continuous evaluations, and excessive self-criticism in a particularly competitive climate (Gardner & Holley, 2011; Hutchins, 2015; Knights & Clarke, 2014; Nori & Vanttaja, 2022). Thoughts of being an imposter tend to have deleterious consequences for individuals' health and work output (Bravata et al., 2020). Research indicates that imposter syndrome is linked to various mental health issues (e.g., stress, burnout, depression, intense negative emotions, low self-esteem, or somatic symptoms; Bravata et al., 2020; Leonhardt et al., 2017; Rohrmann et al., 2016). Therefore, imposter syndrome could be an important contributor to the high prevalence of PhD candidates' mental health problems previously described (e.g., Bonetto et al., 2023).

According to research, health issues tend to undermine work performance (Harvey et al., 2011), and may also contribute to program attrition and dropouts (Gardner, 2009). Besides constituting a major public health issue, these problems also hinder the success of PhD candidates. They are detrimental to their career development and ultimately undermine the innovative force that these young researchers represent (Hazell et al., 2021). For its part, imposter syndrome tends to be detrimental for PhD candidates' research self-efficacy (Haley, 2006; Jöstl et al., 2012), and would favor turnover intentions (e.g., Van de Velde et al., 2019). Moreover, impostor syndrome leads individuals who suffer from it to perceive their competences in a biased way. Yet, perceived competence is a crucial determinant of PhD studies dropout intentions (Litalien & Guay, 2015).

### **The benefits of group identification**

A large body of literature describes how social identification - the simple feeling of belonging to a group - predicts a wide range of positive outcomes for individuals'

(mental, physical and social) health (e.g., Bonetto et al., 2021; Haslam et al., 2018). Positive social identities promote health and well-being because they provide access to a wide range of social and psychological resources that have a significant impact on health, specifically social support (Avanzi et al., 2018), a sense of purpose (Wegge et al., 2006) and agency (Hopkins et al., 2016). The concept of social cure is precisely based on the idea according to which strong interpersonal relationships and social bonds are beneficial for individuals' health.

Therefore, research on social cure typically refers to social identification-building interventions dedicated to improving health (Haslam et al., 2018; Steffens et al., 2019; Wakefield et al., 2022) and social cure effects (associations between social identification and positive health outcomes) through an increased sense of belonging to one or several groups. Social cure-type interventions have now been designed, tested and found to have substantial positive effects on mental health across various populations and contexts (e.g., in different national contexts, during the covid-19 outbreak; e.g., Bonetto et al., 2021).

Importantly, research indicates that identification with a social group tends to favor well-being, and to reduce a wide range of mental health problems like stress, anxiety, depression, and burnout (e.g., Bonetto et al., 2021; Greenaway et al., 2016; Postmes et al., 2019). Accordingly, social identification-building interventions designed to favor individuals' feeling of belonging to social groups were found to substantially decrease feelings of loneliness, anxiety and symptoms of depression (e.g., Haslam et al., 2016). These social cure effects nevertheless remain relatively unexplored in the population of PhD candidates. Yet, the results previously described suggest that positive social identification may be an important protective factor that could be linked with PhD candidates' mental health.

Likewise, a few studies have shown a beneficial effect of group identification on impostor thoughts among PhD candidates. Across two studies (one cross-sectional and one longitudinal), Sverdlik et al. (2020) showed that perceptions of membership within one's scholarly community predicted fewer impostor thoughts among PhD candidates in Canada (although effect sizes were modest;  $r_{Study1} = -.16^{**}$ ,  $r_{Study2} = -.14^{**}$ ). Hence, this suggests that social identification - with one's scholarly community - may also be a potential protective factor against impostor syndrome among PhD candidates.

The beneficial effects of social identities for individuals apply to other domains than health and negative self-perceptions (such as impostor thoughts). Indeed, social identities seem to be associated with positive work outcomes, and thus favor career success. Highlighting the mechanisms behind the link between social identity and work-related variables, Maton et al. (2017) investigated the relationships between group identity and research self-efficacy (one's confidence to have the skills required to perform as a scientist) in a sample of STEM PhD candidates taking part in a program for high-achieving students from underrepresented minorities backgrounds. Results showed that science identity (i.e., how much being a scientist is viewed as part of who they are) and sense of community with the program's participants were both positively associated with participants' research self-efficacy (respectively  $r = .52^{**}$  and  $r = .26^{**}$ ). These work-related variables would in turn be predictive of career success (e.g., self-efficacy has been found to be predictive of publication output; Hemmings & Kay, 2010). These previous studies tended to focus on effects on individuals' self-efficacy, but these beneficial effects in the workplace can be expected to extend to other work-related variables able to influence PhD candidates' career success (e.g., perceived competence).

### **The present study**

In a nutshell, it seems that identification with a social group is associated with several positive outcomes in terms of health (e.g., reduced stress), self-perception (e.g., reduced imposter thoughts), and work (e.g., greater self-efficacy) in a variety of contexts. Nevertheless, few studies have really focused on the PhD candidates population, which is particularly prone to the problems described above (e.g., poor mental health, imposter syndrome). Moreover, these studies often focused on health (from a classic social cure perspective) to the detriment of other kinds of variables such as imposter syndrome or work-related variables that have attracted less attention from social cure researchers.

The present study aimed to test the extent to which group identification could have beneficial effects for PhD candidates, in particular by promoting their mental health, mitigating their feelings of imposture, and promoting their work. As a consequence, we formulated three hypotheses:

H1: Group identification will be negatively associated with psychological health problems (i.e., stress, anxiety, depression, burnout, obsessive passion).

H2: Group identification will be negatively associated with imposter thoughts.

H3: Group identification will be positively associated with work related variables expected to favor career success (i.e., self-efficacy, perceived competence, harmonious passion).

Preregistration, data and supplementary analyses for the present study are openly available here: [https://osf.io/kyzdr/?view\\_only=f175d8e570444ee4a243fefebfa9826](https://osf.io/kyzdr/?view_only=f175d8e570444ee4a243fefebfa9826). Statistical analyses were conducted using Jamovi (Şahin & Aybek, 2019). Informed consent was obtained from all participants involved in the study. This research has received a favorable opinion from the [anonymized for peer review] Ethics Committee, reference: 2023\_004

## Method

An online questionnaire was distributed to a convenience sample of 124 French PhD candidates, a rare and difficult to access population (74.60% female, 23.70% male, 1.80% 'other',  $M_{age} = 28.57$ ,  $SD_{age} = 5.99$ ,  $M_{year\ of\ PhD} = 2.64$ ,  $SD_{year\ of\ PhD} = 1.09$ ). In our sample, 19.10% were in their 1st year of PhD program, 26.10% in their 2nd year, 27.00% in their 3rd year, and 27.80% 'more'. In addition, 59.10% did their PhD in 'Social sciences, behavioral sciences and law', 13.90% in 'Physical sciences, life sciences and technology', 8.70% in 'Humanities', 8.70% in 'Health and related fields', 4.30% in 'Architecture, engineering and related technology' 1.70% in 'Education', 1.70% in 'Mathematics, computer and information sciences', 0.90% in 'Agriculture, natural resources and preservation', and 0.90% in 'Other' fields. They were 0.00% in 'Personal, protective and transportation services', 'Business, management and public administration', or 'Visual and performing arts and communication technologies'.

### Group identification

Identification to the group of PhD candidates (to the 'PhD community') was measured through a 4-item group identification measure (e.g., 'I feel strong ties with PhD candidates'; Doosje et al., 1995). Participants answered using a 7-point Likert scale (from 1 'Not at all' to 7 'Completely'). The scale displayed adequate internal consistency ( $\omega = .71$ ; one item dropped: 'I see myself as a PhD candidate').

### Stress

Participants filled the Perceived Stress Scale (PSS-4; Cohen et al., 1983; see Lesage et al., 2012 for the French 4-item version). They were asked to rate the extent to which they experienced each of the listed situations (e.g., 'unable to control the important things in your life') in the past month using 5-point Likert scales (from 1 'Never' to 5 'Very often'). The scale displayed adequate internal consistency ( $\omega = .75$ ).



### **Anxiety**

Participants filled the Generalized Anxiety Disorder (Gad-7; Spitzer et al., 2006; see Micoulaud-Franchi et al., 2016 for the French version). They were asked to rate the extent to which they experienced each of the listed situations (e.g., 'Feeling nervous, anxious or on edge') in the preceding two weeks. They answered using 4-point Likert scales (from 1 'Not at all' to 4 'Nearly every day'). The scale displayed high internal consistency ( $\omega = .91$ ).

### **Depression**

The questionnaire included the Beck Depression Inventory-Fast Screen-France (BDI-FS-Fr; Alsaleh & Lebreuilly, 2017). They were asked to report the answer that best describes their condition (e.g., sadness, pessimism) over the past 2 weeks and answered using a 4-point Likert scale (from 1 to 4) adapted to the item. The scale displayed high internal consistency ( $\omega = .84$ ).

### **Burnout**

Participants filled the Burnout Measure Short version (BMS-10; Malach-Pines, 2005; see Lourel et al., 2007 for the French version) adapted to the PhD context (e.g., 'When you think about your PhD work...' '...you feel tired'). Participants were asked to indicate their answers using 7-point Likert scales (from 1 'Never' to 7 'Always'). The scale displayed high internal consistency ( $\omega = .89$ ).

### **Imposter thoughts**

Imposter syndrome was assessed through the Leary Impostorism Scale (e.g., 'Sometimes I am afraid I will be discovered for who I really am'; Leary et al., 2000; see Bonetto et al., 2023 for the French version). Participants were asked to indicate how well each item corresponded to them in the context of their PhD. They reported their answers

using a 7-point Likert scale (from 1 'Not at all characteristic of me' to 7 'Extremely characteristic of me'). The scale displayed high internal consistency ( $\omega = .92$ ).

### **Self-efficacy**

The questionnaire included the General Self-Efficacy Short Scale (ASKU; Beierlein et al., 2013; see Décieux et al., 2020 for the French version) adapted to the PhD context (e.g., 'In the context of your PhD work' 'I can rely on my own abilities in difficult situations'). Participants reported their answers using 7-point Likert scales (from 1 'Not at all characteristic of me' to 7 'Extremely characteristic of me'). The scale displayed high internal consistency ( $\omega = .85$ ).

### **Perceived competence**

Perceived competence was assessed using the 'need for competence' sub-dimension of the Need satisfaction scale ('I have confidence in my ability to finish my PhD'; Van der Linden et al., 2018). This scale was validated in the domain of doctoral studies and was previously used in order to measure the feeling of competence in the PhD context (e.g., De Clercq et al., 2021). The scale displayed adequate internal consistency ( $\omega = .71$ ).

### **Passion**

The questionnaire finally included the Passion scale (Valleran et al., 2003; see Valleran, 2015 for the French version) adapted to the PhD context ('Concerning your work for your PhD...'). This scale allowed us to measure participants levels of harmonious (the person controls the activity and this activity is in harmony with their other activities; e.g., 'My activity is in harmony with the other activities in my life';  $\omega = .84$ ) and obsessive passion (the activity absorbs a lot of space in the person's self and conflict is experienced; e.g., 'I have the impression that my activity controls me';  $\omega = .76$ ) for their PhD activities. It also allowed us to measure passion criteria, that is the extent to

which the individual likes the activity, values it, spends time and energy on it, considers it an important part of himself or herself, and considers this activity a passion (Marsh et al. 2013; Vallerand et al. 2003; e.g., ‘My activity is passion for me’;  $\omega = .86$ ). This measure is generally used as a covariate in statistical analyses involving harmonious and obsessive passion (e.g., Vallerand et al., 2003). Harmonious and obsessive passions both showed strong positive correlations with passion criteria ( $r = .50^{***}$  and  $r = .70^{***}$  respectively) and correlated negatively (controlled for criteria;  $r = -.33$ ,  $p < .001$ ).

### **Socio-demographic variables**

Finally, participants indicated their gender and age, the discipline they were doing a PhD in, and how many years they had been in the PhD program.

All these measures were presented to participants in a randomized order, at the exception of the passion scale. This is because this scale took much longer to administer than our other measures, we preferred to place it at the end of the questionnaire in order to limit mid-questionnaire dropouts due to questionnaire length (Galesic & Bosnjak, 2011).

## **Results**

Descriptive statistics and correlations between all study variables can be found in Tables 1 and 2 respectively. For correlation analyses with obsessive and harmonious passion, we conducted partial correlations with passion criteria as a control variable.

All our measures of mental health issues (i.e., stress, anxiety, depression, burnout) showed strong positive intercorrelations ( $.69 \leq r's \leq .78$ , all  $p's < .001$ ). Obsessive passion was positively correlated with stress, anxiety, depression, and burnout (controlling for passion criteria;  $.30, \leq r's \leq .37$ , all  $p's < .01$ ).

For its part, imposter syndrome showed medium-to-strong positive correlations with these mental health issues ( $.36 \leq r's \leq .47$ , all  $p's < .001$ ). It also displayed strong

negative correlations with self-efficacy ( $r = -.49, p < .001$ ) and perceived competence ( $r = -.59, p < .001$ ). However, no association was observed between imposter thoughts and obsessive or harmonious passion (all  $p$ 's  $> .05$ ).

Self-efficacy and perceived competence displayed a strong positive correlation ( $r = .54, p < .001$ ). Perceived competence correlated positively with harmonious passion ( $r = .32, p < .001$ ). However, no association was observed between self-efficacy and harmonious passion ( $r = .16, p > .05$ ).

**Table 1.**

*Descriptive statistics for all study variables*

	Identification	Stress	Anxiety	Depression	Burnout	Obsessive passion	Imposter syndrome	Self-efficacy	Perceived competence	Harmonious passion	Passion criteria
N	124	124	124	124	124	116	124	124	124	116	116
Mean	5.00	3.16	2.36	1.66	4.03	2.95	2.96	3.62	2.99	4.47	5.12
Standard deviation	1.21	0.72	0.81	0.56	1.08	1.14	1.13	0.74	0.80	1.25	1.28

Note. The sample decreased due to mid-questionnaire dropouts

**Table 2.**

*Correlations between all study variables*

	1	2	3	4	5	6	7	8	9	10
Identification	—									
Stress	-.25 **	—								
Anxiety	-.20 *	.75 ***	—							
Depression	-.42 ***	.69 ***	.72 ***	—						
Burnout	-.39 ***	.73 ***	.78 ***	.77 ***	—					
Obsessive passion	-.29 **	.33 ***	.30 **	.32 ***	.37 ***	—				
Imposter syndrome	-.17	.36 ***	.43 ***	.47 ***	.37 ***	.00	—			
Self-efficacy	.24 **	-.12	-.10	-.35 ***	-.23 *	-.08	-.49 ***	—		
Perceived competence	.33 ***	-.40 ***	-.44 ***	-.57 ***	-.53 ***	-.12	-.59 ***	.54 ***	—	
Harmonious passion	.20 *	-.36 ***	-.32 ***	-.47 ***	-.52 ***	-.33 ***	-.16	.16	.32 ***	—

Note. \*  $p < .05$ , \*\*  $p < .01$ , \*\*\*  $p < .001$ . The correlations with Obsessive and Harmonious passions are controlled for passion criteria

Regression analyses were conducted. As expected, group identification showed negative associations with stress ( $\beta = -.25, p < .01$ ), anxiety ( $\beta = -.20, p < .05$ ), depression ( $\beta = -.42, p < .001$ ), and burnout ( $\beta = -.39, p < .001$ ), and obsessive passion (controlled

for criteria;  $\beta = -.26$ ,  $p < .01$ ). These associations remained significant when gender and age were statistically controlled for (see OSF). Furthermore, female participants, in comparison with male participants, reported higher levels of stress ( $\beta = .26$ ,  $p < .01$ ) and anxiety ( $\beta = .33$ ,  $p < .001$ ).

Contrary to our expectations, no association was observed between group identification and imposter thoughts ( $\beta = -.17$ ,  $p = .06$ ), providing evidence against H2. This association remained non-significant when gender and age were statistically controlled for (see OSF). Furthermore, female participants, in comparison with male participants, reported higher levels of imposter syndrome ( $\beta = .23$ ,  $p < .05$ ).

As expected, group identification showed positive associations with self-efficacy ( $\beta = .24$ ,  $p < .01$ ), perceived competence ( $\beta = .33$ ,  $p < .001$ ), harmonious passion (controlled for criteria;  $\beta = .16$ ,  $p < .05$ ). These associations remained significant when gender and age were statistically controlled for (see OSF). These results thus provide support for H3.

## Discussion

The present study aimed to examine the beneficial effects of social identification for PhD candidates. More precisely, we expected that identification to the group of PhD candidates could have beneficial effects for PhD candidates, in particular by (1) promoting their mental health, (2) mitigating their feelings of imposture, and (3) promoting their work. As a consequence, we hypothesized that PhD candidates identification to the group of PhD candidates will be negatively associated with psychological health problems (i.e., stress, anxiety, depression, burnout, obsessive passion; H1) and imposter thoughts (H2), but positively associated with work related variables expected to favor career success (i.e., self-efficacy, perceived competence, harmonious passion).

First, as expected, group identification showed negative associations with stress, anxiety, depression, burnout, and obsessive passion. These results provide support for H1. They are also in line with a large body of research about social cure effects showing that identification with a social group tends to favor well-being, and to reduce a wide range of mental health problems (stress, anxiety, depression, and burnout; e.g., Bonetto et al., 2021; Greenaway et al., 2016; Postmes et al., 2019). As expected from these previous studies, our results suggest that positive social identification - here identification to the group of PhD candidates - may be an important protective factor for PhD candidates mental health.

Second, and contrary to our expectations, no association was observed between group identification and imposter thoughts, providing evidence against H2. This result is inconsistent with Sverdlik et al.'s (2020) previous observations according to which the perception to belong to one's scholarly community may be a potential protective factor against impostor syndrome among PhD candidates. This result casts doubt on the impact of identification on PhD candidates' imposter thoughts. Further research is needed to gain a clearer picture of the relationships between group identification and impostor syndrome among PhD candidates.

Third, as expected, group identification showed positive associations with self-efficacy, perceived competence, and harmonious passion. These results provide support for H3, and are in line with previous findings showing that social identities tend to be associated with positive work outcomes (Maton et al., 2017). In other words, among PhD candidates, identification to the community of PhD candidates seems to be positively associated with variables expected to determine future career success (e.g., Hemmings & Kay, 2010).

Finally, our analyses were able to highlight - once again - the importance of considering how passion-related beliefs and attitudes shape mental health outcomes. Replicating results in the literature showing a clear link between dual passion and psychological distress among university students (Peixoto et al., 2021), our results did show positive links between obsessive passion for academia and stress, depression, anxiety, burnout. These point at the potential need to integrate components related with work-life balance, labor rights and digital privacy (see more specifically Lutsgarten et al., 2020) into training aimed at PhD candidates. In fact, the effectiveness of interventions to separate identity and self-esteem outcomes from academic work should be tested as a viable way to buffer the detrimental effects of obsessive passion for academia on mental health.

To summarize, identification to the community of PhD candidates tends to favor mental health and work self-perceptions among PhD candidates. These results enrich the social cure literature (1) by highlighting a social cure effect in the specific and little-studied population of doctoral students, and (2) by showing such effects on work-related variables (variables often neglected in the social cure literature in favor of health-related variables).

### **Limitations**

Our results are constrained by four main limitations. First, our sample could have been larger to increase the statistical power of the present study (e.g., Wegener et al., 2022). However, the population of PhD candidates represents a tiny fraction of the population of OECD countries (OECD, 2022). Second, these results should be replicated in a sample that more closely matches the distribution of PhD candidates by discipline, and a more balanced gender distribution (in the present study, the sample was 23.70% male). Third, the correlational nature of our study should invite caution regarding the

interpretation of our results. Although the literature provides evidence regarding the causal influence of group identification on health (e.g., Haslam et al., 2016), further studies should be conducted in order to explore potential causal links between group identification and all our outcome variables in the specific population of PhD candidates through experimental methods (Haig, 2003). Fourth, our study used short self-reported measures for our variables of interest, in which psychometric properties may not be optimal (e.g., Baumeister et al., 2007).

### **Perspectives**

Social groups can cure, but they can also harm, and several variables have been proposed to explain the shift from the former (social cure) to the latter (social curse; e.g., Häusser et al., 2020; Wakefield et al., 2019). In particular, social cure effects have been found to be moderated by group esteem (DeMarco & Newheiser, 2019). These effects are qualified by group esteem (i.e., the degree to which the group is socially valued and liked). For instance, DeMarco and Newheiser (2019) found that gaining a high-esteem group membership tends to favor individuals' needs satisfaction and well-being (social cure), while gaining a low-esteem group membership tends to undermine individuals' needs satisfaction and well-being (social curse). The perception of mutual social support in the group has also been identified as an important moderator of social cure effects (e.g., Häusser et al., 2020). Frisch et al. (2014) showed that social support received from people participants identified with was a more powerful stress buffer than support received from people the participant did not identify with. Our results (social cure effects) suggest that the PhD candidate identity would provide resources (e.g., self-esteem, social support) to PhD candidates. However, these characteristics of this group identity should be further explored in future studies in order to identify their putative impact on PhD candidates' health and work. Finally, the consideration of harmonious and obsessive passion



represents an original aspect of the present contribution. Indeed, to our knowledge, few studies have focused on the relationship between social identity and passion (for an example, see Bernabé et al., 2014). Consequently, future studies should aim to replicate these results, particularly in other contexts than the doctorate.

At a practical level, the present study's findings can inform interventions aimed at promoting PhD candidates' mental health and work on the basis of validated social cure interventions (Haslam et al., 2018; Steffens et al., 2019; Wakefield et al., 2022). Indeed, our results suggest that social identification-building interventions dedicated to create or strengthen social identities among PhD candidates would be beneficial for both mental health and career success. These results are also relevant for guiding doctoral supervision practices, and could draw supervisors' attention to the importance of supporting PhD candidates in their integration into social groups that promote their health and success as researchers. The effectiveness of these interventions and of such doctoral supervision practices will also depend on the support offered by broader policies, making it possible to capitalize on the potential of group identities for PhD candidates' health, work, and capacity for innovation (Jetten et al., 2014).

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