



UNIVERSIDADE D  
COIMBRA

Rafael José Gonçalves de Melo

**THE HUNTED MIND**  
UNVEILING THE EVOLUTIONARY PATHWAY TO SUICIDAL  
IDEATION

Dissertação no âmbito do Mestrado Integrado em Psicologia, subespecialização em Psicologia Clínica e da Saúde: Intervenções Cognitivo-Comportamentais nas Perturbações Psicológicas e Saúde, orientada pela Professora Doutora Paula Cristina de Oliveira de Castilho Freitas e apresentada à Faculdade de Psicologia e de Ciências da Educação da Universidade de Coimbra.

Setembro de 2019



Faculdade de Psicologia e de Ciências da Educação  
da Universidade de Coimbra

# THE HUNTED MIND: Unveiling the Evolutionary Pathway to Suicidal Ideation

Rafael José Gonçalves de Melo

Dissertação no âmbito do Mestrado Integrado em Psicologia, subespecialização em Psicologia Clínica e da Saúde: Intervenções Cognitivo-Comportamentais nas Perturbações Psicológicas e Saúde, orientada pela Senhora Professora Doutora Paula Cristina de Oliveira de Castilho Freitas e apresentada à Faculdade de Psicologia e de Ciências da Educação da Universidade de Coimbra.

Setembro de 2019



UNIVERSIDADE D  
COIMBRA

# The Hunted Mind: Unveiling the Evolutionary Pathway to Suicidal Ideation

*To my parents, sister and friends.*

Contents

*Acknowledgments*..... II

*Preface*..... IV

*Table of Studies*..... VII

**Study I** ..... 1

    Abstract ..... 3

    Resumo ..... 4

    Introduction ..... 5

    Method ..... 10

    Results ..... 21

    Discussion ..... 31

    References ..... 39

**Study II** ..... 49

    Abstract ..... 51

    Resumo ..... 52

    Introduction ..... 53

    Method ..... 58

    Results ..... 65

    Discussion ..... 71

    References ..... 77

## Acknowledgments

O produto que se apresenta neste documento é o somatório do esforço e da cooperação de várias pessoas. Como tal, deixo o meu profundo agradecimento:

Aos meus pais e irmã, pela segunda luta que marcou este ano. Pela paciência atrás de protocolos preenchidos.

À Professora Doutora Paula Castilho, por exigir o melhor de mim. Pela sapiência, rigor, dedicação e abertura que iluminou o percurso deste projeto.

Ao senhor Comandante dos Bombeiros Voluntários de Coimbra, Nelson Antunes, ao Doutor Rui Ângelo, da Divisão de Segurança, Saúde e Estatuto Social da Autoridade Nacional de Emergência e Proteção Civil, e à Doutora Raquel Pinheiro, da Escola Nacional de Bombeiros, pela carinhosa atenção com que receberam este projeto e pelos importantes contributos que ofereceram para o seu sucesso.

Aos doutorandos Ana Pinto e Diogo Carreiras, pela vossa atenção preocupada e importante contributo para o resultado deste projeto.

À Lia Almeida e ao Rui Carreira, um abraço muito especial a ambos, pela ajuda preciosíssima não apenas na recolha de protocolos, como na partilha de experiências “bombeirísticas”.

À Olívia Salvador e irmã, Angélique Salvador, pela ajuda na recolha de protocolos.

À Joana Flórido, pelo esforço na dinamização e divulgação do projeto.

Por último, mas principalmente, a todas as bombeiras e bombeiros que retiraram um momento das suas atividades para responderem ao alegre protocolo que lhes propusemos.

[...]

*Não era ainda lá Nesso chegado,  
quando nós ali fomos dar connosco  
num bosque sem caminho assinalado.  
Sem fronda verde, mas na cor bem fosco;  
sem ramo liso, aos nós, tortos, bicudos,  
sem pomos, mas com muito espinho tosco*

[...]

*Portanto o mestre disse: “Se dos troncos  
colheres um raminho a qualquer planta,  
os pensamentos teus se farão broncos.”  
Então, junto a um silvado, se adianta  
a colher um raminho este meu punho;  
e o seu tronco gritou: “Quem me quebranta?”  
E feito em sangue escuro testemunho,  
recomeçou: “Assim me dilaceras?  
Piedade a teu espírito não dá cunho?  
Homens fomos e eis-nos silvas meras:  
Bem deverias ter a mão mais pia,  
Se em nós almas de serpes supuseras.”  
E como em tição verde a que arderia  
uma das pontas, já a outra geme  
e range pelo vento que assobia,  
assim juntos o lenho roto espreme  
sangue e palavra; e o ramo então de cima  
deixo cair, e quedo tal quem teme.*

[...]

*Na selva cai, sem ver onde pousou;  
mas lá onde a Fortuna a tal se presta,  
e ali como grão de erva germinou.  
Surge uma ervinha e planta brava resta:  
e as Harpias lhe pastam toda a folha,  
fazem-lhe dor e à dor dão uma fresta.  
Iremos, como os mais, pela recolha  
dos despojos, mas não para vesti-los;  
que não é justo ter o que se tolha.  
Na triste selva vamos destruí-los  
e hão-de ficar-nos corpos pendurados,  
co as más sombras, nas sarças a cobri-los.*

[...]

A DIVINA COMÉDIA, Dante Alighieri (*Inferno*, XIII)

## Preface

Despite the very visual, almost cinematographic representation of the seventh circle of Dante's *Inferno*, inflicting people with fear since the fourteenth century, suicide and suicide-related behaviours are considered nowadays a major public health issue worldwide (Joiner, Ribeiro, & Silva, 2012; Nock et al., 2018; Ribeiro et al., 2016). According to the World Health Organization (2019), nearly 800 000 people die by suicide each year all around the globe, meaning a death by suicide every 40 seconds (O'Connor & Pirkis, 2016), and being the second major cause of death amongst youngsters (15-29 years of age); it is also estimated that at least 20 times more individuals attempt suicide than those who die by it and millions more have suicide-related cognitions (WHO, 2019). Moreover, data regarding the United Kingdom since the 1990s show that suicide among young males has markedly increased; given that divorced men possess higher suicide rates, one possible explanation for such phenomenon is that rising rates of divorce may bring together rising rates of suicide (Williams, 2014).

Now, data regarding Portugal is markedly scarce. According to the Portuguese Suicidology Society (SPS, 2019), an average rate of 8.23 suicides (per 100 000 habitants) was observed between 1996 and 2011 (year in which a rate of 9.6 suicides was detected). The WHO (2019), regarding data of the year 2016, points out a rate of 14.0 suicides to Portugal, one higher than the worldwide rate (10.6) but lower than the rate of Europe (15.4).

Pollock and Williams (1998) state that there are two major areas in the study of suicidal behaviour: research aiming to identify social and demographic risk factors and studies searching for psychological mechanisms or processes that mediate these behaviours. In the present works, we aimed for the latter. Concerning terminology, we use the one appointed by Silverman, Berman, Sanddal, O'Carroll, and Joiner (2007), according to whom *suicide-related behaviours* are primarily distinguishable in the presence or absence of intent to die, but also in the absence or presence of sustained physical harm. In the **presence** of intent to die, the term *suicidal behaviour* should be applied; note that suicidal behaviour is the current type of cognitions, communications and behaviours that is of interest in the current works – that is, in which there's some



intent to die. Conversely, in the **absence** of such intent, the term *self-harm* should be applied (Silverman et al., 2007; Van Orden et al., 2010).

So far, we have introduced the urgency in studying suicide and suicide-related behaviours. But why study suicidal behaviours among *firefighters*? The fundamental premise is that the firefighter vocation is intrinsically related to job-related stressors that constitute high-risk occupational hazards, such as repeated exposure to provocative and painful events (Stanley, Boffa, Hom, Kimbrel, & Joiner, 2017). A somewhat robust body of research has gathered evidence that firefighters are at greater risk for mental health problems, such as posttraumatic stress disorder (Heinrichs et al., 2005), depression, sleep disturbances, and alcohol abuse (Carey, Al-Zaiti, Dean, Sessanna, & Finnell, 2011; Hom, Stanley, Rogers, et al., 2016). In addition, recent studies have shown compelling evidence that a subpopulation in which rates of suicide ideation, plans, and attempts are higher than the general population is firefighters (Hom, Stanley, Ringer, & Joiner, 2016; Stanley, Hom, Hagan, & Joiner, 2015). In fact, Stanley and colleagues (2015) have found the following prevalence estimates of suicide-related behaviours throughout the career of 1027 current and retired northern-American firefighters: 46.8% for suicide ideation, 19.2% for suicide plan, 15.5% for suicide attempt, and 16.4% for non-suicidal self-injury (NSSI), or self-harm. The cross-national lifetime prevalence of suicidal ideation, plans, and attempts in the general population is about 9.2%, 3.1%, and 2.7%, respectively (Nock et al., 2008). Moreover, in a recent systematic review, Stanley, Hom, and Joiner (2016) conclude that first responders (including firefighters) are at elevated risk for suicide.

In Portugal, psychological research among firefighters is deeply integrated in the organizational and work or occupational psychology, especially in investigating work characteristics and engagement phenomena (*e.g.*, Ângelo & Chambel, 2015; Moreira & Queirós, 2012). In the clinical field, posttraumatic stress disorder (*e.g.*, Carvalho & Maia, 2009; Pinto, Henriques, Jongenelen, Carvalho, & Maia, 2015), and stress and burnout (*e.g.*, Miguel & Queirós, 2013; Vara & Queirós, 2007) have received considerable attention. To our knowledge, no studies have aimed to explore suicide-related behaviours, especially suicidal behaviours, among Portuguese firefighters.

Thus, the present dissertation is grounded in the Interpersonal-Psychological Theory of Suicide (IPTS; Joiner, 2005; Van Orden et al., 2010), for it is the first of the ideation-to-action theories and has already received considerable empirical evidence (Chu, Buchman-Schmitt, Hom, Stanley, & Joiner, 2016; Chu et al., 2017; Klonsky,

Saffer, & Bryan, 2018; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). To our knowledge, very few studies have been developed in Portugal within an interpersonal theory framework; besides, I (R. M) contacted the National Authority for Emergency and Civil Protection (ANEPC) in March of the current year and there is no available data regarding number of suicides or suicidal ideation prevalence among Portuguese firefighters, hence the importance of the present studies.

Concerning its structure, two studies compose this dissertation. In the first study (**Study I**), we further take on the validation of the Portuguese version of the Interpersonal Needs Questionnaire (Van Orden, Cukrowicz, Witte, & Joiner, 2012) using a sample of current firefighters, by investigating the factor structure and psychometric properties of the measure. Moreover, since the interpersonal theory's primary assumption have shown mixed results (Chu et al., 2017; Ma, Batterham, Calear, & Han, 2016), we intended to perform some empirical tests as well. In turn, in the second study (**Study II**), we tried to unveil the contribution of additional psychological constructs, especially those regarding a noxious early environment and evolutionary-shaped behavioural defensive responses included in our genetic repertoire, to the interpersonal theory's desire for suicide. So, we intended to examine the extent to which early experiences of threat, subordination and devaluation may impact on desire for suicide, through self-judgement and entrapment as mediators.

## Table of Studies

The dissertation is composed by the following studies:

- I. Melo, R., & Castilho, P. (2019). *Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*. Manuscript in preparation.
- II. Melo, R., & Castilho, P. (2019). *The impact of aversive childhood experiences, self-criticism and entrapment on desire for suicide*. Manuscript in preparation.

# Study I

Melo, R., & Castilho, P. (2019). *Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*. Manuscript in preparation.

**Thwarted Interpersonal Needs: Confirmatory Factor  
Analysis and Psychometric Properties of the Portuguese  
Version of the Interpersonal Needs Questionnaire**

**Authors:**

Rafael de Melo<sup>1\*</sup>

Paula Castilho, PhD.<sup>1,2</sup>

**Affiliations:**

<sup>1</sup>Faculty of Psychology and Education Sciences, University of Coimbra, Portugal

<sup>2</sup>Centre for Research in Neuropsychology and Cognitive Behavioural Intervention (CINEICC).  
Faculty of Psychology and Education Sciences, University of Coimbra, Portugal

---

\*Correspondence concerning this study should be addressed to:

Rafael J. Gonçalves de Melo, Faculdade de Psicologia e de Ciências da Educação, Universidade  
de Coimbra

Rua do Colégio Novo, Apartado 6153 3001-802 Coimbra, Portugal

E-mail address: rafaeljg.melo@gmail.com

### **Abstract**

Previous research has identified firefighters as a high-risk subpopulation for suicide-related thoughts and behaviours. The Interpersonal-Psychological Theory of Suicide proposes that suicidal desire is proximally caused by two interpersonal states, thwarted belongingness and perceived burdensomeness, measured by the Interpersonal Needs Questionnaire (INQ). In the present study, the factor structure of the Portuguese adaptation of the 15-item version of the INQ was examined, as well as the psychometric properties and convergent validity, among a sample of 169 current Portuguese firefighters. Moreover, regression models were undertaken to explore the link between the two interpersonal constructs, the likelihood of reporting suicidal ideation throughout firefighters' career and its severity, in an attempt to empirically test the theory's synergy hypothesis. We also considered the nonlinear association between thwarted belongingness and perceived burdensomeness, and the severity of suicide ideation throughout the career. Results showed that the original factor structure, comprising two first-order latent variables (thwarted belongingness and perceived burdensomeness), was confirmed in a 12-item model through confirmatory factor analyses. The Portuguese version of the INQ-12 also revealed adequate internal consistency and converged as expected with measures of suicidal ideation, depression, anxiety, entrapment, mindfulness and self-compassion. Furthermore, the linear perceived burdensomeness term and both quadratic and cubic terms of thwarted belongingness were significantly associated with the severity of suicidal ideation throughout the career. Contrariwise to theory predictions, the two-way interaction between both interpersonal theory's constructs was not significant. As such, a new way of calculating such interaction is offered. Overall, the INQ-12 demonstrated to be a psychometrically robust measure of thwarted interpersonal needs.

**Keywords:** interpersonal theory of suicide, thwarted belongingness, perceived burdensomeness, desire for suicide, firefighters, confirmatory factor analyses.

## **Resumo**

Estudos prévios identificaram os bombeiros como sendo uma subpopulação de risco elevado para a experiência de pensamentos e comportamentos relacionados com o suicídio. A Teoria Interpessoal-Psicológica do Suicídio propõe que o desejo de suicídio é causado, de forma proximal, por dois estados interpessoais, pertença frustrada e percepção de onerosidade, avaliados pelo *Interpersonal Needs Questionnaire* (INQ). No presente estudo, a estrutura fatorial da adaptação Portuguesa da versão de 15 itens do INQ foi examinada, bem como as características psicométricas e validade convergente, numa amostra de 169 bombeiros Portugueses no ativo. Mais ainda, numa tentativa de testar empiricamente a hipótese sinérgica da teoria, modelos de regressão foram testados para explorar a relação entre os dois construtos interpessoais, a probabilidade de ideação suicida ao longo da carreira e a sua severidade. Teve-se ainda em consideração a associação não linear entre pertença frustrada e percepção de onerosidade e a severidade de ideação suicida ao longo da carreira. Os resultados demonstraram que a estrutura fatorial original, composta por duas variáveis latentes de primeira ordem (pertença frustrada e percepção de onerosidade), foi confirmada num modelo de 12 itens através de análises fatoriais confirmatórias. A versão Portuguesa do INQ-12 também revelou consistência interna adequada e convergiu, no sentido esperado, com medidas de ideação suicida, depressão, ansiedade, *entrapment*, *mindfulness* e autocompaixão. Adicionalmente, o termo linear de percepção de onerosidade e os termos quadrático e cúbico de pertença frustrada foram significativamente associados com a severidade da ideação suicida ao longo da carreira. Ao contrário do previsto pela teoria, a interação entre ambos os construtos da teoria interpessoal não se revelou significativa. Como tal, uma nova forma de calcular esta interação é oferecida. Em suma, o INQ-12 demonstrou ser uma medida de necessidades interpessoais frustradas robusta do ponto de vista psicométrico.

**Palavras-chave:** teoria interpessoal do suicídio, pertença frustrada, percepção de onerosidade, desejo de suicídio, bombeiros, análises fatoriais confirmatórias.

## **Introduction**

Suicide is a remarkably complex phenomenon, puzzling the minds of both philosophers and researchers alike for hundreds of years (Kleiman et al., 2018; O'Connor & Nock, 2014). The notable complexity of suicide is due to a wide variety of suicidal phenomena that intertwine with each other making the pathway to suicide (Millner, Lee, & Nock, 2017), including suicidal ideation, suicide attempt, and, ultimately, death by suicide. Despite the significant increase in studying suicide and suicidal behaviours in the last few decades, a lot remains unclear (Klonsky, Saffer, & Bryan, 2018). For example, one question that is still of limited knowledge is the attempter-ideator distinction, since most suicidal ideators do not come to attempt suicide (Klonsky et al., 2018; May & Klonsky, 2016; Wetherall et al., 2018).

Given its importance to suicide prediction and prevention (Klonsky et al., 2018), recent developments in the psychology of suicidal behaviour have spawned a new background that enhances the search about the shift from suicidal ideation to suicide attempt: the ideation-to-action framework (Klonsky, May, & Saffer, 2016). So far, the ideation-to-action framework is comprised of four “next-gen” theories of suicide: the Interpersonal-Psychological Theory of Suicidal Behaviours (IPTB; Joiner, 2005; Van Orden et al., 2010); the Integrated Motivational-Volitional Model (IMV; O'Connor, 2011; O'Connor, Cleare, Eschle, Wetherall, & Kirtley, 2016; O'Connor & Kirtley, 2018); the Three-Step Theory (3ST; Klonsky & May, 2014, 2015); and the Fluid Vulnerability Theory (Rudd, 2006).

More than a decade ago, more specifically in 2005, Thomas Joiner introduced the Interpersonal Theory of Suicide in his book “*Why People Die by Suicide*”. Since then, the IPTB has contributed to substantial advances in the field of suicide and suicide-related behaviours, whether it be from a scientific or a clinical standpoint (Chu, Buchman-Schmitt, et al., 2017). The interpersonal theory posits that the most severe form of suicidal ideation proximally arises through thwarting of specific interpersonal needs (Joiner, 2005; Van Orden et al., 2010). In particular, desire for suicide results from an interaction between thwarted belongingness, perceived burdensomeness and interpersonal hopelessness – that is, hopelessness specific to these interpersonal states (Tucker et al., 2018). Also, capability for suicide accounts for the transition from suicidal desire to



suicidal behaviours, namely lethal or near-lethal suicide attempts. By now, a somewhat robust body of literature has meant to test the theory's primary hypotheses, among distinct samples, such as adolescents (Barzilay et al., 2015; Buitron et al., 2016), community-based participants (Batterham et al., 2018; Christensen, Batterham, Mackinnon, Donker, & Soubelet, 2014; Christensen, Batterham, Soubelet, & MacKinnon, 2013), college students (Suh et al., 2017; Tucker et al., 2018), clinical inpatients (Cero, Zuromski, Witte, Ribeiro, & Joiner, 2015) and outpatients (Hawkins et al., 2014), the military (Bryan, Morrow, Anestis, & Joiner, 2010; Chu et al., 2018), and firefighters (Chu, Buchman-Schmitt, Hom, Stanley, & Joiner, 2016; Gallyer et al., 2018). The IPTS has been studied across a wide range of axis I (*e.g.* depressive and bipolar disorders) and axis II (*e.g.*, borderline and antisocial personality disorders) psychological disorders (Silva, Ribeiro, & Joiner, 2015), insomnia (Chu, Hom, et al., 2017; Hom et al., 2017), bulimia nervosa (Smith et al., 2013), and bondage and discipline, dominance and submission, and sadomasochism (BDSM) practitioners (S. L. Brown, Roush, Mitchell, & Cukrowicz, 2017), as well.

Thus, recently, two systematic reviews of which one employed meta-analytic strategies were carried out (Chu, Buchman-Schmitt, et al., 2017; Ma, Batterham, Calear, & Han, 2016). Ma and colleagues (2016) assessed a total of sixty-six studies and, contrary to prospect, findings suggest mixed evidence for the IPTS core predictions. In this regard, the effect of perceived burdensomeness on suicide ideation was the most supported association, having been found to contribute to a greater amount of explained variance in suicide ideation than thwarted belongingness, across a range of settings (*e.g.*, hospital and online populations). Moreover, in some cases perceived burdensomeness accounted for the sole significant effect. On the other hand, the effect of thwarted belongingness on suicide ideation, despite having been less frequently tested than the other central interpersonal construct, was found to be non-significant in 60% of studies due to stronger effects of the perception of being a burden on others or other covariates. Furthermore, when significant, an unmet need to belong contributed less to the amount of explained variance in suicide ideation than perceived burdensomeness. In line with these findings, Chu and colleagues (2017) meta-analytically assessed 122 samples from 114 reports and found general support for the interpersonal theory of suicide. The relationships between both thwarted belongingness and perceived burdensomeness and severe suicidal ideation, suicide risk and continuous suicide attempt history revealed to be significant weak-to-

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

moderate positive ones, with perceived burdensomeness showing a greater effect size to all three associations than thwarted belongingness ( $r = .48$ ,  $r = .42$  and  $r = .25$  vs.  $r = .37$ ,  $r = .33$  and  $r = .11$ , respectively). Concerning the interaction between both interpersonal constructs, it was found to be, beyond main effects, significantly linked to suicide ideation and risk (Chu, Buchman-Schmitt, et al., 2017).

In order to test the interpersonal theory's main constructs, some measures have been developed. Gauging thwarted belongingness and perceived burdensomeness, the Interpersonal Needs Questionnaire (INQ) has been constructed (Van Orden, Cukrowicz, Witte, & Joiner, 2012; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). Also, the Acquired Capability for Suicide Scale (ACSS) has been made to assess capability for suicide (Bender, Gordon, Bresin, & Joiner, 2011; Van Orden et al., 2008); more lately, a 7-item scale specifically measuring the fearlessness about death component of the capability for suicide was refined from the original ACSS (ACSS-FAD) (Ribeiro et al., 2014). Additionally, the perceived pain tolerance relative to others component of the capability for suicide can be assessed by a single self-report item, this being the item 4 of the original ACSS (S. L. Brown et al., 2017). Recently, Tucker and colleagues (2018) have built the Interpersonal Hopelessness Scale (IHS), a new theoretically derived self-report scale meant to precisely gauge hopelessness about thwarted belongingness and perceived burdensomeness states.

Of all these measures, to our knowledge only the Interpersonal Needs Questionnaire – 15 items (INQ-15) possesses some calibration to the Portuguese non-clinical population, as presented by Costa and Campos (2018). Costa and Campos (2018) began a series of four studies, using either college students or community adults samples, by examining the factor structure of the Portuguese version of the INQ-15 through Exploratory Factor Analyses (EFA). As such, Costa and Campos' (2018) results suggested a three-factor solution, explaining 63.71% of the total variance measured on the INQ-15, contrasting to *a priori* predictions. According to the IPTS, desire for suicide (that is, active suicidal ideation) is due to hopeless states of thwarted belongingness and perceived burdensomeness (Joiner, 2005; Van Orden et al., 2010). Even though two EFAs suggested a four-factor model for the original version (25 items), Van Orden and colleagues (2012) have retained a final theoretically-consistent two-factor model that best described the latent structure of the INQ-15, which was confirmed via three Confirmatory

Factor Analyses (CFAs) employed in independent samples. Notwithstanding, it is noteworthy that Costa and Campos' (2018) three-factor model was confirmed via CFA, performed in the third study, since the model presented acceptable fit to the data ( $\chi^2/df = 3.422$ , CFI = 0.934, NFI = 0.910; RMSEA = 0.086, SRMR = 0.059; AIC = 363.711). Besides, when experimented a two-factor model, it did not fit the data well ( $\chi^2/df = 5.4642$ , CFI = 0.871, NFI = 0.848; RMSEA = 0.119, SRMR = 0.104; AIC = 564.143).

About reliability, Cronbach's alphas between .71-.86 suggested an acceptable-to-good internal consistency for the thwarted belongingness subscale and an excellent internal consistency for the perceived burdensomeness subscale ( $\alpha$ s = .91-.92) (Costa & Campos, 2018). In turn, Van Orden and colleagues (2012) found an alpha coefficient of .85 for the thwarted belongingness subscale and an alpha coefficient of .89 for the perceived burdensomeness subscale. Thus, regarding the convergent validity, Costa and Campos (2018) found significant positive correlations between perceived burdensomeness and depressive symptoms (Centre for Epidemiological Studies – Depression scale [CES-D]; Radloff, 1977),  $r = .49, p < .001$ , psychache (Psychache Scale [PS]; Holden, Metha, Cunningham, & McLeod, 2001),  $r = .46, p < .001$ , and suicide risk (Suicide Behaviors Questionnaire Revised [SBQ-R]; Osman et al., 2001),  $r = .50, p < .001$ . Significant positive correlations between thwarted belongingness and depressive symptoms (CES-D),  $r = .43, p < .001$ , psychache (PS),  $r = .36, p < .001$ , and suicide risk (SBQ-R),  $r = .35, p < .001$ , were also observed. In addition, the criterion validity of both interpersonal constructs was evaluated by comparison to suicide risk (operationalized via the SBQ-R), showing significant differences between values equal or above ( $N = 89$ ) and below ( $N = 314$ ) the cut-off point of the SBQ-R (score of 7) and scores on the perceived burdensomeness subscale ( $t[401] = 5.42, p < .001$ , Cohen's  $d = .97$ ), as well as on the thwarted belongingness subscale ( $t[401] = 6.51, p < .001$ , Cohen's  $d = .77$ ). The criterion validity of the two interpersonal constructs was also evaluated by comparison to suicide ideation (measured by the Suicide Ideation Questionnaire [SIQ]; Reynolds, 1988), exhibiting significant differences between values equal or above ( $N = 18$ ) and below ( $N = 262$ ) the cut-off point of the SIQ (score of 41) and scores on both perceived burdensomeness subscale ( $t[278] = 4.47, p < .001$ , Cohen's  $d = 1.60$ ) and thwarted belongingness subscale ( $t[278] = 3.18, p < .001$ , Cohen's  $d = .75$ ).

Next, on the second study, Costa and Campos (2018) analysed a longitudinal path analysis model, testing the direct and indirect effects of suicidal ideation at two different

moments through perceived burdensomeness, thwarted belongingness and both interpersonal constructs. Findings revealed a direct association between suicidal ideation at both moments ( $\beta = 0.40$ ,  $t = 4.55$ ,  $p < 0.001$ ; 95% CI [0.252, 0.588],  $p < 0.001$ ), and an indirect relationship between suicidal ideation at both moments through perceived burdensomeness ( $\beta = 0.24$ ,  $t = 2.72$ ,  $p < 0.01$ ; 95% CI [0.064, 0.404],  $p < 0.05$ ), and via thwarted belongingness and perceived burdensomeness ( $\beta = 0.05$ ,  $t = 2.38$ ,  $p < 0.01$ ; 95% CI [0.014, 0.010],  $p < 0.01$ ); however, thwarted belongingness did not mediate the link between suicidal ideation at both moments, in line with previous research, as stated before (Chu, Buchman-Schmitt, et al., 2017; Ma et al., 2016). In the third study, Costa and Campos (2018) examined the discriminant validity by correlating the scores on the INQ-15 subscales with the Multidimensional Scale of Perceived Social Support (MSPSS; Zimet, Dahlem, Zimet, & Farley, 1988), a measure meant to gauge the perceived social support. The INQ-15 subscales were found to be negatively and significantly correlated with all perceived social support dimensions (family, friends and significant others). Lastly, in Costa and Campos' (2018) fourth study, some evidence of temporal stability across two weeks was collected: the correlation between scores on the perceived burdensomeness subscale at both moments was  $r = .78$ ,  $p < .001$ , and the correlation between scores on the thwarted belongingness subscale was  $r = .92$ ,  $p < .001$ .

In sum, there has been a robust body of literature that meant to test the interpersonal theory's central hypotheses, across a wide range of populations, and findings suggest mixed evidence for such hypotheses. So, further research is needed, especially among high-risk populations. Moreover, the need to have available and reliable measures that mean to gauge psychological constructs is of utmost importance. Hence, the main purpose of this study is to adapt and validate the Portuguese version of the Interpersonal Needs Questionnaire-15 among a sample of current Portuguese firefighters. We started by exploring the underlying factor structure of the INQ-15; secondly, we intended to examine the psychometric properties of the factor structure, in particular items' analyses, internal consistency, and convergent validity, by comparing the INQ-15 with measures of suicidal ideation, depression, anxiety, entrapment, mindfulness and self-compassion. In addition, we searched for the relative contribution of desire for suicide (the interaction between perceived burdensomeness and thwarted belongingness) in predicting suicidal ideation throughout the firefighters' career.

## **Method**

### **Participants and Procedures**

Participants were 169 current Portuguese firefighters, recruited both via email and in person, across a convenient range of fire stations. Of these 169 firefighters, 134 were male (79.3%) and 35 were female (20.7%). The overall mean age was 33.27 years ( $SD = 10.31$ ; range: 18-62). Approximately half of participants had never been married (49.1%) and 47 participants (27.8%) were married. Regarding education, 56.8% ( $N = 96$ ) of individuals completed the 12<sup>th</sup> grade (overall mean complete years of education was 12.03;  $SD = 2.532$ ; Range: 4-19), and only 17.8% ( $N = 30$ ) had some college degree. Of 33 (20.5%) individuals that reported previous or current military service, 28 responded that were never exposed to war scenarios. Concerning the firefighter career, the majority (87.0%) was volunteer and, among these, 78 (78.8%) reported as being fire station's employees. The mean years of service as firefighter was 12.38 years ( $SD = 10.054$ ; Range: 1-44). About 14.8% of participants reported some previous or current suicidal ideation throughout the career, with nearly 3% of respondents reporting at least one suicide attempt. Gender differences regarding some important variables are shown in Table 1. Table 2 presents additional sociodemographic data regarding the total sample.

We started by contacting all eighteen District Commands of the National Authority for Emergency and Civil Protection (ANEPC) all over Portugal Continental, aiming to reach current firefighters through a web-based survey (a Limesurvey link), sent via email, as well as the National School of Firefighters (ENB). Concerning the web-based survey, participants were initially presented with a consent form built upon the most recent version of the Declaration of Helsinki; then, each participant had to tick a "Yes" or "No" option, offering informed consent. Only if the participant chose "Yes", he or she would proceed with the survey. At the end of the survey, a psychoeducational form was presented. Briefly, this form alerted that suicide-related thoughts and behaviours are, in themselves, reasons to seek help, since they pose a threat to one's life. In line with this, numerous national contacts and resources were presented, including the European Union emergency telephone number, 112, for more emergent situations. This psychoeducational form was presented nonetheless the participant's response to the informed consent, even if he or she would choose "No". The web-based survey had an estimated time of completion of about 20 minutes. Also, participants who provided their email address

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

following survey completion are eligible to win a 49.99€ prize to be drawn when the research is completed.

**Table 1** - Sample's demographic characteristics and gender differences regarding some important variables.

	Male (N = 134)		Female (N = 35)		<i>t</i>	<i>p</i> *	<i>d</i>
	M	SD	M	SD			
<b>Age</b>	34.77 (N = 128)	10.386	27.77 (N = 35)	7.971	-4.295	.000	0.756
<b>Education (Years)</b>	11.71 (N = 117)	2.436	13.27 (N = 30)	2.559	3.092	.002	-0.624
<b>Career (Years)</b>	13.67 (N = 128)	10.486	7.22 (N = 32)	5.802	-4.668	.000	0.761
	n	Valid %	n	Valid %	$\chi^2$	<i>p</i> *	<i>V</i>
<b>Marital Status</b>	(N = 134)		(N = 35)		20.929	.000	.352
Never married	54	40.3	29	82.9			
Married	45	33.6	2	5.7			
Together	23	17.2	2	5.7			
Separated	-	-	-	-			
Divorced	11	8.2	2	5.7			
Widowed	1	0.7	-	-			
<b>Firefighter Rank</b>	(N = 110)		(N = 24)		12.780	.078	.309
Recruit	8	7.3	-	-			
3 <sup>rd</sup> Rank	44	40.0	18	75.0			
2 <sup>nd</sup> Rank	23	20.9	5	20.8			
1 <sup>st</sup> Rank	16	14.5	1	4.2			
Sub-chief	8	7.3	-	-			
Chief	6	5.5	-	-			
Commanding Officers	5	4.5	-	-			

\*two-tailed *p* value.

Notwithstanding our efforts, only 11 responses to the web-based survey were collected, representing just 5.3% of the total responses. Hence, a total of 198 participants (94.7%) were recruited personally, through paper form, from various convenient fire stations across the Centre (mainly) and Alentejo regions of Portugal. The paper form followed the structure of the web-based survey. Of these 209 responses, 40 were not considered viable due to several missing data or a notoriously biased response style. At the end, the sample contains data from 169 current Portuguese firefighters. Importantly, all respondents were invited to voluntarily participate in the present research. Moreover, confidentiality and anonymity of all data was assured, being emphasised that the data was only used for the purpose of the study.

**Table 2** - Sociodemographic data regarding the total sample.

Sociodemographic Characteristics	Current Firefighters (N=169)	Valid (%)
<b>Geographic Location</b>		
Alentejo	6	3.6
Algarve	-	-
Centre	160	94.7
Lisbon	-	-
North	3	1.8
<i>Missing</i>	-	-
<b>Military Service</b>		
No	128	79.5
Permanent Board	1	0.6
Contract	4	2.5
Volunteer	18	11.2
Mandatory	10	6.2
<i>Missing</i>	8	-
Military Service Time Ago	M = 19.73; SD = 8.388; Range: 2-38	
<i>Missing</i>	7	-
<b>War Exposition</b>		
No	28	100.0
Yes	-	-
<i>Missing</i>	5	-
<b>Firefighter Rank</b>		
Recruit	8	6.0
3 <sup>rd</sup> Rank	62	46.3
2 <sup>nd</sup> Rank	28	20.9
1 <sup>st</sup> Rank	17	12.7
Sub-chief	8	6.0
Chief	6	4.5
Commanding Officers	5	3.7
<i>Missing</i>	35	-

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

<b>Emergency Medical Services</b>		
Yes	145	11.9
No	20	86.3
Only non-emergent transport	3	1.8
<i>Missing</i>	1	-
<b>Responded to Suicide Attempt</b>		
Yes	117	69.2
No	52	30.8
<i>Missing</i>	-	-
<b>Responded to Suicide Death</b>		
Yes	105	62.1
No	64	37.9
<i>Missing</i>	-	-
<b>Suicidal Ideation Throughout the Career</b>		
Yes	25	14.8
No	144	85.2
<i>Missing</i>	-	-
<b>Suicide Attempt Throughout the Career</b>		
Yes	5	20
No	20	80
<i>Missing</i>	-	-

---

## Measures

*Demographics Overview.* A demographics overview questionnaire was made and aimed to assess sociodemographic (*e.g.*, marital status, sex, education level) and firefighter occupational characteristics (*e.g.*, firefighter rank, years serving as firefighter).

*Interpersonal Needs Questionnaire – 15 (INQ-15;* Van Orden et al., 2012; Portuguese version by Campos & Holden, 2016). The INQ is an instrument that measures two proximal factors for desire for suicide, thwarted belongingness and perceived burdensomeness, as proposed by the IPTS (Joiner, 2005; Van Orden et al., 2010, 2008). The present version of the measure includes 15 items: 9 items measure the concept of thwarted belongingness (*e.g.*, “These days, I am close to other people”) and 6 items measure perceived burdensomeness (*e.g.*, “These days I think I am a burden on society”). Each item is rated in a Likert-like scale, rated from 1 (“Not at all true for me”) to 7 (“Very



true for me”). Therefore, higher total scores for each subscale mean higher either thwarted belongingness or perceived burdensomeness. According to Van Orden and colleagues (2012), the subscales of thwarted belongingness and perceived burdensomeness, regarding internal consistencies, presented Cronbach’s alpha coefficients of .85 and .89, respectively. This instrument counts with the Portuguese version by Campos and Holden (2016), who states that the measure possesses adequate psychometric properties concerning internal consistency: alpha coefficients for the thwarted belongingness subscale of .80, and .88 for the perceived burdensomeness subscale.

*Depression, Anxiety and Stress Scales* (DASS-21; Lovibond & Lovibond, 1995; Portuguese version by Pais-Ribeiro, Honrado, & Leal, 2004). The Depression, Anxiety and Stress Scales contain 21 items rated in a Likert-like scale, ranging between 0 (“Did not apply to me at all”) and 3 (“Applied to me very much or most of the time”), regarding the prior week. The DASS-21 are composed of 7 items for each correspondent negative emotional state. Examples for the subscales are: “I could see nothing in the future to be hopeful for” (Depression), “I felt I was close to panic” (Anxiety) and “I found it hard to calm down after something that upset me” (Stress). Higher results show greater levels of Depression, Anxiety or Stress, calculated by the sum of the 7 items scores that compose each subscale. The original version of the DASS-21 demonstrated good psychometric properties, with Cronbach’s alphas of .91, .81, and .89 to depression, anxiety, and stress, respectively (Lovibond & Lovibond, 1995). Concerning the Portuguese version, similar values were found, with alpha coefficients of .85 to depression, .74 to anxiety and .81 to stress (Pais-Ribeiro et al., 2004). In this study, Cronbach’s alphas were .90 to depression, .88 to anxiety and .91 to stress.

*Entrapment Scale* (ES; Gilbert & Allan, 1998; Portuguese version by Carvalho, Gouveia, Castilho, & Pimentel, 2011). The Entrapment Scale quantifies the degree of two types of entrapment, internal and external, through a 5-point Likert-like scale, ranging from 0 (“Not at all like me”) to 4 (“Extremely like me”). The internal entrapment (6 items; e.g., “I feel powerless to change myself”) is associated with motivation to escape, which has been triggered by internal aversive feelings and thoughts, contrary to external entrapment (10 items; e.g., “I can see no way out of my current situation”), in which the motivation to escape comes from the perception of threats that are present in the outside world. In the original version, Gilbert and Allan (1998) report good-to-excellent

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

Cronbach's alphas for the reliability of the internal entrapment scale (.93 for a student sample, .86 for a depressed group), as well as one extracted factor regarding factor structure, accounting for 74.8% of the variance in the student sample and for 60.5% in the depressed group. For the external entrapment scale, reliability alpha coefficients have been reported by the authors as 0.88 for the student group and 0.89 for the depressed sample, and also one extracted factor (factor structure) accounting for 49.9% of the total variance for the student sample; however, two factors were obtained for the depressed group, later merged into one (correlation between both factors was 0.58). Therefore, higher scores in each subscale represent higher levels of entrapment (internal vs. external, although some authors calculate the total sum of the scale; Carvalho et al., 2011). In the present study, the Cronbach's alpha coefficient for the internal entrapment subscale was .88, for the external entrapment subscale was .90 and for the total scale was .93.

*Suicidality Scale (SS; Castilho, Carreiras, & Pinto, 2019).* The Suicidality Scale measures how often an individual has thoughts about suicide and death. It includes 11 items rated on a 4-point scale (0 = "It never happens to me"; 1 = "It happens to me sometimes"; 2 = "It happens to me a lot" 3 = "It always happens to me"). With the adaptation of this scale, we intend to have a retrospective measure regarding thoughts and wishes of death and suicide, throughout each firefighter's career. Besides, one item examines if there was ever a suicidal plan (8 – "There were times when I planned how I would kill myself"). Preliminary analyses suggest a factor structure comprised of two first-order factors, hopelessness and death-related cognitions, and a second-order factor, reflecting the general construct of suicidality. The SS has demonstrated excellent reliability (Cronbach's alpha for the total scale was .94). More presence of suicidal thoughts is represented by higher scores on the SS. A Cronbach's alpha coefficient of .93 has been observed in this study. Regarding convergent validity, the SS has been associated as expected with measures of psychopathology (depression, anxiety and stress), as well as negative (experiential avoidance and entrapment) and positive (self-compassion) psychological variables.

*Self-Compassion Scale (SELFCS; Neff, 2003; Portuguese version by Castilho, Pinto-Gouveia, & Duarte, 2015).* The Self-Compassion Scale is a 5-point Likert scale, ranging from 1 ("Almost never") to 5 ("Almost always"), in which participants rate how

often the statements are true. The SELFCS includes 26 items that measure global self-compassion in six subscales, those being the six components of global self-compassion as defined by Neff (2003): *self-kindness* (five items; e.g. “I try to be understanding and patient towards those aspects of my personality I don’t like”), *self-judgment* (five items; e.g. “I can be a bit cold-hearted towards myself when I’m experiencing suffering”), *common humanity* (four items; e.g. “I try to see my failings as part of the human condition”), *isolation* (four items; e.g. “When I’m really struggling, I tend to feel like other people must be having an easier time of it”), *mindfulness* (four items; e.g. “When I’m feeling down I try to approach my feelings with curiosity and openness”), and *overidentification* (four items; e.g. “When something upsets me, I get carried away with my feelings”). It is also possible to divide the components or subscales into two major dimensions: a positive one, with positive components (i.e., self-kindness, common humanity and mindfulness), and a negative one, with negative components (i.e., self-judgment, isolation, and overidentification). As for the scores, a total score can be calculated by doing the sum of all items (and reverse-coding for the self-judgment, isolation, and over-identification subscales), as well as average scores for each subscale (partial scores). Higher scores show greater levels of self-compassion. The original version presented good psychometric properties, including adequate reliability of the total scale ( $\alpha_{Total} = .92$ ) and all subscales ( $\alpha_{Self-kindness} = .78$ ;  $\alpha_{Self-judgment} = .77$ ;  $\alpha_{Common\ humanity} = .80$ ;  $\alpha_{Isolation} = .79$ ;  $\alpha_{Mindfulness} = .75$ ;  $\alpha_{Overidentification} = .81$ ; Neff, 2003), with similar values being found in the Portuguese validation study: Cronbach’s alphas for the total scale in the clinical and nonclinical samples were .92 and .94, respectively, and ranged between .70 and .88 for the subscales (Castilho et al., 2016). In this study, the reliability alpha coefficient for the total scale was .84.

*Cognitive and Affective Mindfulness Scale-Revised* (CAMS-R; Feldman, Hayes, Kumar, Greeson, & Laurenceau, 2007; Portuguese version by Teixeira & Pereira, 2009). The Cognitive and Affective Mindfulness Scale was initially developed by Kumar, Feldman and Hayes (2005), derived from the need to measure individual differences in mindfulness, as stated by the consensus panel of Bishop and colleagues (2004) that proposed an operational definition of the construct. The authors of the CAMS-R noticed four components of mindfulness (and henceforth of this self-report measure): “1) the ability to regulate attention, 2) an orientation to present or immediate experience, 3) awareness of experience, and 4) an attitude of acceptance or nonjudgement towards

experience” (Feldman et al., 2007; p. 178). The revised form of this instrument therefore focuses (and offers a measure of) a mindful approach to the engagement with internal experiences as a second-order latent factor. All 12 items are divided into four first-order factors as predicted theoretically [ $\chi^2(50)=81.04, p = .004$ ; RMSEA = .050; SRMR = .051; CFI = .95], being each factor composed of three items: attention (*e.g.*, “It is easy for me to concentrate on what I am doing”), present-focus (*e.g.*, “I am preoccupied by the past”), awareness (*e.g.*, “I try to notice my thoughts without judging them”), and acceptance (*e.g.*, “I can accept things I cannot change”). About scoring, it is a 4-point Likert response format, ranging from 1 (“Rarely/Never”) to 4 (“Almost always”). Acceptable reliability alpha coefficients, regarding only the overall score, are reported in three samples (reaching between .74 and .77) (Feldman et al., 2007). Stronger alpha coefficients have been reported (.81; Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006; and .85; McPhail et al., 2005). Results regarding criterion (discriminant and convergent) validity show that higher scores in mindfulness are related to higher well-being, more problem analysis, cognitive flexibility, and plan rehearsal and less outcome fantasy and stagnant deliberation, lower distress, and lower levels of maladaptive emotion regulation (*e.g.*, thought suppression, experiential avoidance, *etc.*). In the present study, regarding reliability, the Cronbach’s alpha coefficient for the total score was .74.

### **Data Analytic Plan and Preliminary Data Analyses**

The present study had a cross-sectional design and all statistical procedures, with the exception for the confirmatory factor analyses, were performed through IBM SPSS Statistics 24 software. About gender differences in age, number of complete years of education, and number of years of service as firefighter, independent samples Student-*t* tests with Levene’s test for equality of variances were carried out. Moreover, the significance of the chi-square statistic ( $\chi^2$ ) was utilized to search for differences among marital status and firefighter ranks, between both genders. The level of significance was considered at 5%. In addition, effect sizes for the Student-*t* test (Cohen’s *d*) and chi-square (Cramer’s *V*) are reported. Concerning interpretation of the effect size statistics’ strength, we used Cohen’s (1988) criteria for Cohen’s *d* (small = 0.2, medium = 0.5, and large = 0.8) and Pallant’s (2016) criteria for Cramer’s *V* (two categories: small = .01, medium = .30, and large = .50).

The factor structure of the Portuguese version of the Interpersonal Needs Questionnaire-15 was tested by confirmatory factor analyses (CFA) through Mplus software, version 8.1, with robust maximum likelihood (RML) estimation. The basic assumptions for CFA were firstly investigated. Multivariate normality was assessed through Mardia's (1985) multinormality test, and examination of skewness and kurtosis values for each individual item (Table 3), since all significance tests meant to detect violation of multivariate normality have limited usefulness (Kline, 2016). Nonnormality of the data distribution was concluded if the values were greater than  $|3|$  for skewness and above  $|10|$  for kurtosis (Kline, 2016), as well as a significant Mardia's test (Mardia's multivariate skewness = 247.067;  $p < 0.001$ ; Mardia's multivariate kurtosis = 561.559;  $p < 0.001$ ). Examination of skewness and kurtosis values additionally suggest that items 1 to 5 were significantly skewed and highly kurtotic. Therefore, the data weren't normally distributed. In regard to extreme values (univariate and multivariate outliers), we chose to maintain these cases in the analysis, since they may be of interest to the study, and to preserve the factor's variability (Kline, 2016). Since linearity among latent variables is difficult to evaluate, linear relationships among pairs of observed variables were assessed via inspection of scatterplots (Ullman, 2013). In general, a somewhat linear association between the measured variables was observed. Examination of the determinants of the covariance matrix also did not pointed out any extremely small determinant, which suggests absence of problems with singularity or multicollinearity. Lastly, the residuals are centered around zero and appear to have a symmetrical distribution, even though one residual remained quite large, and, as seen below, the final model was able to fit the data reasonably well. Regarding missing data, only three participants skipped an item of the INQ-15. Such missing data were managed by mean substitution, in which the mean of the subscale of a certain item replaced missing scores.

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

**Table 3** – Descriptive statistics for all items of the INQ-15.

	Mean	SE	SD	Variance	Skewness	Kurtosis
Item 1	1.14	0.044	0.570	0.325	4.691	23.199
Item 2	1.15	0.043	0.553	0.305	4.558	22.920
Item 3	1.21	0.056	0.731	0.534	5.210	31.913
Item 4	1.14	0.041	0.538	0.289	4.756	25.283
Item 5	1.18	0.048	0.630	0.397	4.326	20.121
Item 6	1.33	0.053	0.686	0.471	2.386	5.580
Item 7	2.60	0.131	1.702	2.895	0.822	-0.141
Item 8	3.33	0.166	2.156	4.649	0.473	-1.096
Item 9	2.04	0.129	1.681	2.826	1.654	1.703
Item 10	2.48	0.139	1.803	3.251	1.088	0.217
Item 11	1.93	0.105	1.365	1.864	1.536	1.926
Item 12	1.86	0.109	1.422	2.023	1.951	3.416
Item 13	1.89	0.099	1.291	1.667	1.594	2.356
Item 14	2.28	0.113	1.473	2.169	0.980	0.038
Item 15	2.27	0.127	1.653	2.732	1.287	0.815

Note: SE = standard error of the mean; SD = standard deviation.

Concerning the evaluation of the overall fit of the CFA model, the foremost goodness-of-fit indices were taken into account, besides the chi-squared index, since this index is overly sensitive to sample size, which may result in an underestimation of the model fit (T. A. Brown, 2015), and to violation of the multivariate normality assumption (Schermelleh-Engel, Moosbrugger, & Müller, 2003). Such indices are the comparative fit index (CFI), the root-mean-square error of approximation (RMSEA), and the standardized root-mean-square residual (SRMR). Criteria for good model fit were a non-significant  $\chi^2$  ( $p > .05$ ),  $CFI \geq .95$ ,  $RMSEA \leq .06$ , and  $SRMR \leq .08$ ; criteria for acceptable fit were  $CFI \geq .90$ ,  $RMSEA \leq .08$ , and  $SRMR \leq .10$  (Hu & Bentler, 1999).

Spearman rank order correlations were used to explore not only the associations between the Thwarted Belongingness and Perceived Burdensomeness subscales (intercorrelations between the INQ subscales), but also the relationships between both interpersonal theory latent variables and other theoretically related constructs (convergent validity). We made use of Cohen's (1988) criteria to analyse the size of the correlations: small (from .10 to .29), medium (from .30 to .49) and large (from .50 to 1.00).

The internal consistency (reliability) of the INQ's subscales was assessed using the Cronbach's  $\alpha$  coefficient. Evaluation of the magnitude of the alpha coefficient was

made through Murphy and Davidshofer's (1988) criteria, in which an alpha below .6 is unacceptable, an alpha at the .7 level is low, from .8 to .9 is at the moderate to high level, and above the .9 level is high.

In order to search for gender differences in thwarted interpersonal needs (both scores of Thwarted Belongingness and Perceived Burdensomeness subscales), nonparametric independent samples (Mann-Whitney *U*) tests were utilized.

Lastly, a hierarchical multiple linear regression was utilized to investigate the independent and interactive effects of perceived burdensomeness and thwarted belongingness on the severity of suicidal ideation throughout the career, after controlling for depression, a well-known variable related to suicidal ideation. In order to conduct the linear regression, preliminary data analyses were conducted to ensure that the assumptions of normality, linearity, multicollinearity and singularity, homogeneity of variance (homoscedasticity), and independence of residuals were not violated. Skewness and kurtosis values for the independent and the dependent variables suggested perceived burdensomeness being extremely positively skewed and kurtotic, as well as suicidal ideation throughout the career being highly positively skewed and kurtotic. Ergo, as expected, these variables (and henceforth the interaction between thwarted belongingness and perceived burdensomeness) were not normally distributed. Once the data were nonnormally distributed, the assumption of homoscedasticity also failed (Tabachnick & Fidell, 2013). Nonlinearity was diagnosed from the examination of the residual plot, where standardized residuals were plotted against predicted values. Most of the residuals are either above or below the zero line on the plot at the predicted values, suggesting an S-shaped function. Regarding multivariate collinearity, tolerance values inferior to .10 and variance inflator factor (VIF) values superior to 10.0 were indicators of extreme multicollinearity (Kline, 2016) between thwarted belongingness and perceived burdensomeness, perhaps due to their interaction.

So that the data can be more nicely normally distributed, more linear-related and less heteroscedastic, data transformations were computed (Tabachnick & Fidell, 2013). On one hand, an inverse transformation was applied to perceived burdensomeness (PB), and, on the other hand, a squared-root transformation was applied to suicidal ideation throughout the career (dependent variable). Also, since the residual plot showed a curvilinear, S-shaped function between standardized residuals and predicted values, not only quadratic but also cubic terms were also included in the analysis. In fact, it is

theoretically plausible that the relationship between either thwarted belongingness and perceived burdensomeness and suicidal ideation throughout the career may not be linear, as well (Cero et al., 2015). In this regard, so that lower order coefficients in higher order regression equations may be meaningfully interpreted, each predictor was centered to its mean (Cohen, Cohen, West, & Aiken, 2003; Kline, 2016). Mean-centering the variables is a solution to reduce multicollinearity, too (Tabachnick & Fidell, 2013). With centered predictors, the mean  $M_X$  is zero, and the regression of  $Y$  on  $x$  at  $x = 0$  is meaningful (Cohen et al., 2003). Once centered the linear predictor, the higher order predictors from centered  $x$  were formed.

## **Results**

### **Confirmatory Factor Analysis**

Based on data from current Portuguese firefighters, confirmatory factor analyses were performed. We hypothesized, according to the IPTS, that the model would comprise two first-order factors: perceived burdensomeness and thwarted belongingness. The items 1 to 6 serve as indicators of the perceived burdensomeness factor; the items 7 to 15 serve as indicators of the thwarted belongingness factor.

Structural equation modelling (SEM) analyses with robust maximum likelihood (MLR) estimation were performed using data from 169 firefighters. The baseline model was easily rejectable,  $\chi^2(105, N = 169) = 947.908, p < .001$ . We then tested the hypothesized model. As presented in Table 4, this model (Model 1) was also rejectable,  $\chi^2(89, N = 169) = 268.095, p < .001$ , comparative fit index (CFI) = .79, once it failed to exhibit an adequate fit to the data.



**Table 4** – Goodness of fit statistics for the INQ-15 factor models.

Model	Goodness of fit statistics							
	$\chi^2$ (df)	<i>p</i>	CFI	SRMR	RMSEA	RMSEA 90% CI		AIC
						Low/High	<i>p</i>	
1 (89)	268.095	<.001	.788	.107	.109	.094/.124	<.001	6251.382
2 (52)	89.381	.001	.939	.048	.065	.041/.088	.135	4363.929

*Note:* Model 1 is the hypothesized model: Model 2 is the modified model, in which some items were removed, and others were allowed to correlate.

Through examination of the hypothesized model standardized estimates, the following indicators (*i.e.*, items) had the smallest estimates: item 9 ( $O = .165$ ), item 11 ( $O = .384$ ) and item 12 ( $O = .262$ ), which belong to the thwarted belongingness factor (F2). The remaining estimates for the standardized factor loadings ranged from .487 (item 8 from F1) to 1.004 (item 1 from F1). In addition, those items presented the lowest *R*-Square coefficients (this meaning the amount of accounted variance by the respective factor): item 9 ( $R^2 = .027$ ), item 11 ( $R^2 = .148$ ) and item 12 ( $R^2 = .069$ ), which may indicate very high levels of error. Since those items possessed *R*-Square coefficients inferior to .20, we chose to remove them from the model (Hooper, Coughlan, & Mullen, 2008). Table 5 summarizes the modified model estimated unstandardized and standardized factor loadings and *R*-Square values.

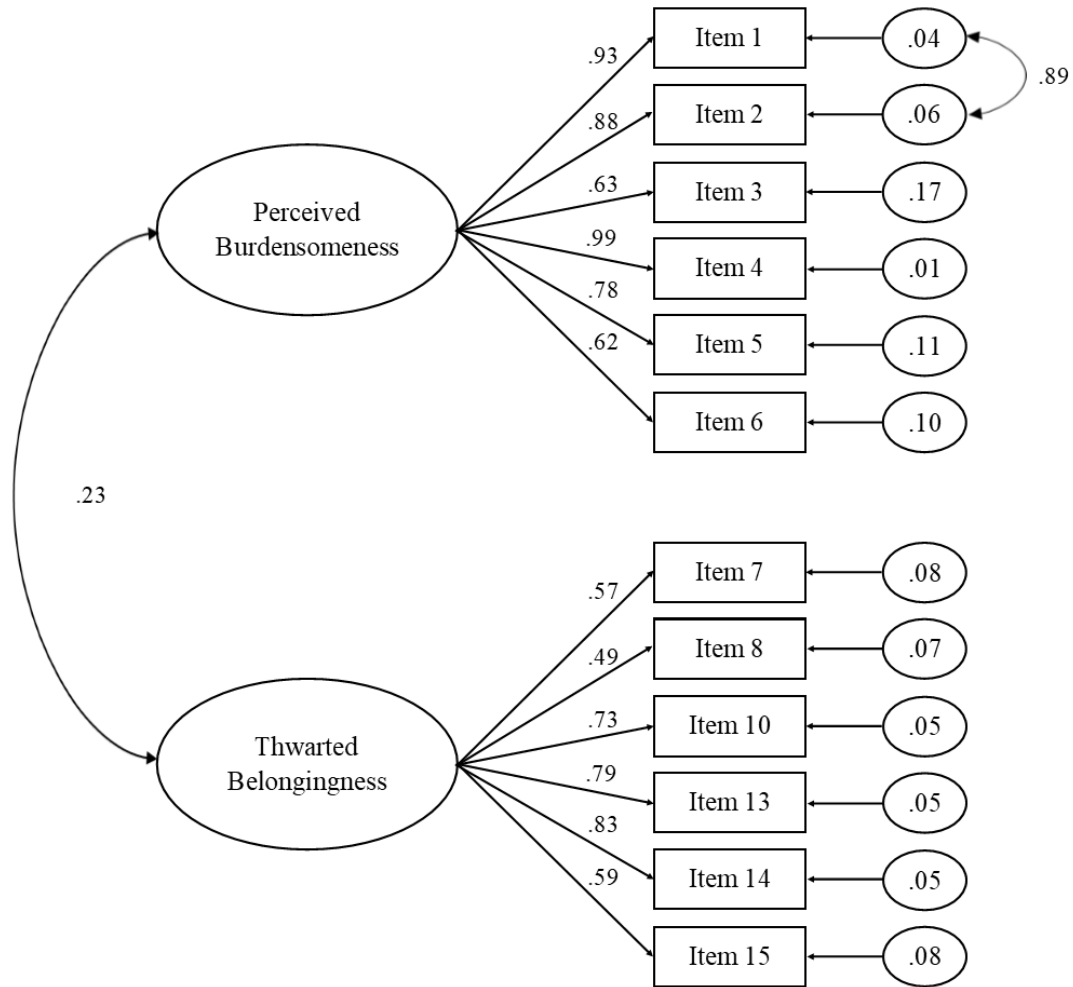
*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

**Table 5** – Modified model estimated unstandardized and standardized factor loadings and R-Square values.

	Estimate	SE	Std Est	R <sup>2</sup>
Perceived				
Burdensomeness (PB)	-	-	-	-
Item 1	1.000	0.000	0.933	0.870
Item 2	0.913	0.067	0.879	0.772
Item 3	0.866	0.178	0.630	0.397
Item 4	1.002	0.119	0.990	0.981
Item 5	0.919	0.141	0.775	0.601
Item 6	0.805	0.105	0.624	0.389
Thwarted				
Belongingness (TB)	-	-	-	-
Item 7	1.000	0.000	0.565	0.319
Item 8	1.106	0.166	0.493	0.243
Item 10	1.362	0.192	0.726	0.527
Item 13	1.058	0.145	0.788	0.621
Item 14	1.268	0.194	0.828	0.685
Item 15	1.014	0.164	0.590	0.348
Covariances				
PB w/ TB	0.118	0.045	0.233	-
Item 1 w/ Item 2	0.048	0.030	0.887	-

Modification indices (MI) were also examined, which suggested that items 1 and 2 might be correlated, both presenting a MI = 77.77. Given that these two items have similar content and belong to the same factor (perceived burdensomeness), correlation of their measurement errors was allowed. Next, we tested the modified model (Model 2), which acceptably fitted the data,  $\chi^2(52, N = 169) = 89.381, p < .001, CFI = .939, RMSEA = .065$ . All standardized factor loadings for the items were significant, ranging from .49 to .99. The modified CFA model of the INQ with significant standardized coefficients presented is shown in Figure 1, where rectangles represent measured variables, and circles represent latent variables. In addition, no hypothesized direct effect is implied by the absence of a line connecting variables.

**Figure 1** – Modified CFA model for the factor structure of the INQ with significant standardized coefficients presented.



As the modified model had an acceptable fit to the data, no additional *post hoc* model modifications were undertaken.

**Reliability, Item Analyses, and Intercorrelations between the INQ subscales**

Correlations between items of the Perceived Burdensomeness subscale ranged from medium to large (range: .494-.972). Concerning the Thwarted Belongingness subscale items, correlations sizes were also moderate to large (range: .300-.655). Correlations between items of both subscales showed small sizes (range: -.001-.258).

Correlations between the INQ-12 factors are presented on Table 6. The matrix exhibited that the correlation between perceived burdensomeness and thwarted belongingness is of medium size.

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

**Table 6** - Intercorrelations (Spearman's rho) between INQ-12 factors.

Factor	PB	TB
Perceived Burdensomeness (PB)	1.000	-
Thwarted Belongingness (TB)	.319***	1.000

\*\*\* $p$  (two-tailed)  $\leq$  .001.

As displayed in Table 7, the Perceived Burdensomeness subscale possessed a high internal consistency, as suggested by a Cronbach's alpha of .91. The alpha coefficient revealed a moderate reliability for the Thwarted Belongingness subscale ( $\alpha = .85$ ).

**Table 7** - Reliability and item analyses for the modified model.

	Mean ( <i>SD</i> )	Corrected Item-total Correlation	Cronbach's Alpha if Item Deleted
Perceived Burdensomeness ( $\alpha = .91$ )			
Item 1	1.14 (.57)	0.451	0.791
Item 2	1.15 (.55)	0.455	0.791
Item 3	1.21 (.73)	0.340	0.794
Item 4	1.14 (.54)	0.441	0.792
Item 5	1.18 (.63)	0.399	0.792
Item 6	1.33 (.69)	0.365	0.793
Thwarted Belongingness ( $\alpha = .85$ )			
Item 7	2.60 (1.70)	0.488	0.781
Item 8	3.33 (2.16)	0.436	0.799
Item 10	2.48 (1.80)	0.613	0.765
Item 13	1.89 (1.29)	0.658	0.763
Item 14	2.28 (1.47)	0.686	0.757
Item 15	2.27 (1.65)	0.461	0.784

### Gender Differences in Thwarted Interpersonal Needs

Nonparametric independent samples tests were performed to evaluate gender differences regarding both scores of the interpersonal theory variables subscales (Table 8). The Mann-Whitney  $U$  tests did not reveal gender differences in perceived burdensomeness ( $U = 2078.00$ ,  $Z = -1.303$ ,  $p > .05$ ) and in thwarted belongingness ( $U = 2336.50$ ,  $Z = -.033$ ,  $p > .05$ ).

**Table 8** - Means, standard deviations, minimum and maximum scores for the Interpersonal Needs Questionnaire-12 factors per gender.

	Masculine (N = 134)				Feminine (N = 35)			
	<i>M</i>	<i>SD</i>	Min	Max	<i>M</i>	<i>SD</i>	Min	Max
Perceived Burdensomeness	7.07	3.17	6.00	28.00	7.43	2.90	6.00	19.00
Thwarted Belongingness	14.92	7.51	6.00	40.00	14.60	6.66	6.00	32.00

### **Convergent Validity**

Convergent validity (Table 9) was assessed by computing Spearman rank order correlations (Spearman's rho) between the INQ-12 latent variables and theoretically related constructs, measured through self-report measures. On one hand, perceived burdensomeness showed a positive and small correlation with anxiety, a positive and medium correlation with thwarted belongingness, depression and suicidal ideation, and a positive and large correlation with entrapment. Also, as expected, perceived burdensomeness exhibited a negative and small correlation with mindfulness, and a negative and medium correlation with self-compassion. On the other hand, thwarted belongingness presented a positive and small correlation with depression and anxiety, and a positive and medium correlation with suicidal ideation and entrapment. Thwarted belongingness showed a negative and medium correlation with mindfulness and self-compassion, as well. These results mean that higher levels of both perceived burdensomeness and thwarted belongingness are associated with higher levels of suicidal ideation, depression, anxiety and entrapment, and lower levels of mindfulness and self-compassion.

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

**Table 9** - Correlation coefficients (one-tailed Spearman's rho) between the study variables.

Variable	1.	2.	3.	4.	5.	6.	7.	8.
1. Perceived Burdensomeness (INQ)	1.000	-	-	-	-	-	-	-
2. Thwarted Belongingness (INQ)	.319***	1.000	-	-	-	-	-	-
3. Suicidal Ideation (SS)	.476***	.354***	1.000	-	-	-	-	-
4. Depression (DASS-21)	.382***	.254***	.646***	1.000	-	-	-	-
5. Anxiety (DASS-21)	.265***	.234**	.473***	.668***	1.000	-	-	-
6. Entrapment (ES)	.510***	.366***	.690***	.667***	.508***	1.000	-	-
7. Mindfulness (CAMS-R)	-.212**	-.41***	-.41***	-.38***	-.37***	-.49***	1.000	-
8. Self-compassion (SELFCS)	-.31***	-.43***	-.51***	-.54***	-.45***	-.54***	.561***	1.000

\*\*p ≤ .01; \*\*\*p ≤ .001

### Multiple Regressions Analyses

In our study, we searched for the relative contribution of desire for suicide (the interaction between perceived burdensomeness and thwarted belongingness) in predicting suicidal ideation throughout the firefighters' career. Specifically, we tested the synergy hypothesis in two ways. First, we conducted a direct logistic regression to examine the independent and interactive associations of the IPTS constructs on the likelihood that respondents would report that they had suicidal ideation throughout their career, after controlling for some important covariates (sex and years as firefighter) (Chu et al., 2016). Hence, the model contained five independent variables (sex, years as firefighter, perceived burdensomeness, thwarted belongingness and their interaction). The full model containing all predictors was significant at a statistical level,  $\chi^2(5, N = 160) = 11.142, p < .05$ , meaning that the model was capable of distinguishing between respondents who reported and didn't report previous or current suicidal ideation throughout their career as firefighters. The model as a whole explained between 6.7% (Cox and Snell R Square) and 11.8% (Nagelkerke R Square) of the variance in suicidal ideation status, and correctly classified 85.6% of cases. However, as shown in Table 10, none of the predictors made a unique statistically significant contribution to the model ( $p$  values  $> .05$ ). The pattern of findings remained the same when no covariates were entered in the regression.

**Table 10** – Logistic Regression of Interpersonal Theory of Suicide Variables Predicting the Likelihood of Reporting Suicidal Ideation Throughout the Career.

	B	S.E.	Wald	df	$p$	Odds Ratio	95.0% C.I. for Odds Ratio	
							Lower	Upper
Sex	1.774	1.059	2.803	1	.094	5.894	.739	47.009
Years as Firefighter	.018	.022	.633	1	.426	1.018	.975	1.063
PB	-.339	.368	.848	1	.357	.712	.346	1.466
TB	-.095	.123	.599	1	.439	.909	.715	1.157
PBxTB	.019	.018	1.208	1	.272	1.019	.985	1.055
Constant	-1.917	2.660	.520	1	.471	.147		

*Note:* N = 160. Presence/absence of suicidal ideation throughout career (dichotomous variable) was entered as the DV. PB = perceived burdensomeness; TB = thwarted belongingness.

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

Second, a hierarchical multiple linear regression was used to measure the independent and the interactive aptitude of perceived burdensomeness (PB) and thwarted belongingness (TB) to predict levels of the severity of suicidal ideation throughout the career (Suicidality Scale), after controlling for the influence of depression, and the quadratic and cubic terms of the two interpersonal theory variables (Table 11).

Levels of depression were entered at Step 1, explaining 46.1% of the variance in the severity of suicidal ideation throughout the career. After entry of thwarted belongingness and perceived burdensomeness at Step 2, the model explained 54.6% of the variance measured in the dependent variable. In Step 3, the interaction between perceived burdensomeness and thwarted belongingness was entered; the variance explained by the model 3 was 55.0%, showing no statistically significant increase. The quadratic terms of thwarted belongingness and perceived burdensomeness were entered at Step 4, explaining 55.7% of the variance in the dependent variable; change statistics also suggested a non-significant increase over the previous model. At last, after entry of thwarted belongingness and perceived burdensomeness cubic terms, the total variance explained by the overall model was 57.5%,  $F(8, 160) = 27.052, p < .001$ .

The interpersonal theory lower order, linear predictors (thwarted belongingness and perceived burdensomeness) explained an additional 8.4% of the variance in suicidal ideation throughout the career, after controlling for depression,  $R$  square change = .084,  $F$  change (2, 165) = 15.282,  $p \leq .001$ . The cubic terms of both thwarted belongingness and perceived burdensomeness also explained an additional 1.8% of the variance in the observed criterion (SS scores), after controlling for depression, the independent and interactive lower order, linear predictors of the IPTS, and their higher order (quadratic) terms,  $R$  square change = .018,  $F$  change (2, 160) = 3.324,  $p < .05$ .

In the full model, neither the linear thwarted belongingness coefficient ( $\beta = .034, p = .678$ ) nor the interaction between thwarted belongingness and perceived burdensomeness ( $\beta = -.006, p = .923$ ) reached statistical significance. Notably, the strongest predictor of the severity of suicidal ideation throughout the career was depression, recording the highest beta value ( $\beta = .523, p \leq .001$ ), followed by the lower order perceived burdensomeness ( $\beta = -.443, p \leq .01$ ). Both quadratic and cubic terms of perceived burdensomeness were not significant at a statistical level ( $\beta = -.616, p = .136$ , and  $\beta = -.477, p = .157$ , respectively). Nevertheless, the higher-order coefficients of



thwarted belongingness, not only quadratic ( $\beta = -.327, p \leq .01$ ), but cubic as well ( $\beta = .312, p < .05$ ) were significant.

**Table 11** – Hierarchical Multiple Linear Regression of Depression, Perceived Burdensomeness, Thwarted Belongingness, and their interaction, quadratic and cubic effects on the Severity of Suicidal Ideation throughout the Career.

	$\beta$	$t$	R	R <sup>2</sup>	Adjusted R <sup>2</sup>	F	p
<b>Model 1</b>			.679	.461	.458	143.028	.000
Depression	.679	11.959					.000
<b>Model 2</b>			.739	.546	.537	66.019	.000
Depression	.522	8.740					.000
TB	.086	1.550					.123
PB	-.294	-4.898					.000
<b>Model 3</b>			.742	.550	.539	50.080	.000
Depression	.518	8.684					.000
TB	.082	1.472					.143
PB	-.337	-4.886					.000
TBxPB	.077	1.255					.211
<b>Model 4</b>			.747	.557	.541	33.986	.000
Depression	.527	8.816					.000
TB	.140	2.102					.037
PB	-.343	-2.995					.003
TBxPB	.050	.785					.433
TB <sup>2</sup>	-.106	-1.635					.104
PB <sup>2</sup>	-.040	-.366					.715
<b>Model 5</b>			.758	.575	.554	27.052	.000
Depression	.523	8.866					.000
TB	.034	.416					.678
PB	-.443	-3.279					.001
TBxPB	-.006	-.097					.923
TB <sup>2</sup>	-.327	-2.666					.008
PB <sup>2</sup>	-.616	-1.497					.136
TB <sup>3</sup>	.312	2.132					.035
PB <sup>3</sup>	-.477	-1.422					.157

Note: N = 169.

The transformed suicidal ideation throughout the career values (the square-root of the total score on the Suicidality Scale [SS]) were entered as the dependant variable.

PB = perceived burdensomeness; TB = thwarted belongingness.

Given that thwarted belongingness didn't seem to be linearly related to suicidal ideation throughout the career but in a curvilinear fashion instead, we calculated the interaction between thwarted belongingness elevated to powers (quadratic and cubic coefficients) and perceived burdensomeness in three new ways. First, the interaction between thwarted belongingness squared and perceived burdensomeness:

$$int_1 = tb^2.pb.$$

Next, the interaction between thwarted belongingness cubic and perceived burdensomeness, given either by:

$$int_2 = tb^3.pb,$$

or

$$int_3 = (tb^3 + tb^2).pb$$

The third equation can be rearranged to produce the algebraically equivalent equation

$$int_3 = [tb(tb + tb^2)].pb .$$

Next, a series of multiple linear regressions were performed with the purpose of testing these new interactions, including scanning for such interactions at high (i.e., one standard deviation above the mean) levels of suicidal ideation throughout the career. Unfortunately, none of the coefficients of the tested interactions reached statistical significance ( $p$  values  $> .05$ ).

## **Discussion**

The Interpersonal-Psychological Theory of Suicide (Joiner, 2005; Van Orden et al., 2010) states that the most dangerous kind of suicidal ideation arises proximally through the interaction between thwarted belongingness and perceived burdensomeness. In this paper, we sought after the factor structure and psychometric properties of the Portuguese version of the INQ-15. In particular, we intended to replicate the two-factor structure suggested by Van Orden and colleagues (2012) and theoretically consistent with

the interpersonal theory among a sample of current Portuguese firefighters. Furthermore, we undertook an empirical test to the theory's synergy hypothesis.

Even though the factor structure of the INQ-15 has already been investigated in non-clinical Portuguese samples (Costa & Campos, 2018), we further the calibration of the measure given that we utilized an arguably higher-risk subpopulation sample for suicide-related behaviours, when compared to the general population, which is firefighters (Hom, Stanley, Ringer, & Joiner, 2016; Stanley, Hom, Hagan, & Joiner, 2015; Stanley, Hom, & Joiner, 2016). To our knowledge, this is the first study that a) explored suicide-related cognitions among current Portuguese firefighters, b) tested some of the interpersonal theory's core assumptions in the Portuguese context, and c) provided a new way to calculate the nonlinear interaction between thwarted belongingness and perceived burdensomeness. Besides, it was the second-only study to a) explore the factorial structure of the Portuguese version of the INQ-15 (Costa & Campos, 2018), b) test some of the interpersonal theory's core assumptions in a sample of firefighters (Chu et al., 2016), and c) account for the nonlinear terms of the interpersonal theory's constructs (Cero et al., 2015). Given that the first study to analyse the factor structure of the Portuguese version of the INQ-15 resulted in a three-factor, non-theoretically consistent model, and the mixed results found regarding the theory's synergy hypothesis (Chu, Buchman-Schmitt, et al., 2017; Ma et al., 2016), our results are important and add to the existing literature.

In order to investigate the factor structure of the Portuguese version of the INQ-15, we only tested one hypothesized, theoretically consistent model, comprising two first-order factors – thwarted belongingness and perceived burdensomeness. However, this hypothesized model did not show a good fit to the data. As items 9, 11 and 12 showed the lowest *R*-square coefficients, which may indicate very high levels of error (Hooper et al., 2008), we opted by removing them of the model. Besides, through examination of modification indices, correlation of the measurement errors of items 1 and 2, since they belong to the same factor (perceived burdensomeness) and have similar content, was allowed. Hence, a new model was tested (model 2). This modified model acceptably fitted the data. All standardized factor loadings for the items were significant. These results suggest that, despite being phenomenologically different from one another, an unmet need to belong is related with the perception of being a burden on others (Van Orden et al., 2012). This finding is also supported by the positive medium correlation between both

interpersonal theory's latent variables. One could argue that if someone perceived her or himself as a burden on others, then she or he should be connected to them. Thus, in this line of thought, it would mean that, as Joiner (2005) writes, "burdensomeness implies belongingness" (p. 135). However, the "need to form and maintain strong, stable interpersonal relationships" is seen as a "fundamental human motivation" (Baumeister & Leary, 1995; p. 497), the way that "virtually no one experiences no ties whatsoever to others" (Joiner, 2005; p. 136). In other words, the interrelation between thwarted belongingness and perceived burdensomeness is such that a minimal connection to others is required in order to one perceive oneself as a burden on others (Joiner, 2005). Hence, the more one perceives oneself as a burden on others, the more one feels disconnected from them. Moreover, both thwarted belongingness and perceived burdensomeness have been linked to a new measure of suicidal ideation, the Suicidality Scale, showing a positive moderate correlation's magnitude. This finding goes in line with previous studies, suggesting that thwarted belongingness and perceived burdensomeness latent variables are associated with suicidal ideation, across a range of measures: Beck Scale for Suicide Ideation (BSS; Beck & Steer, 1991), the Geriatric Suicide Ideation Scale (Heisel & Flett, 2006), the Suicide Behaviors Questionnaire Revised [SBQ-R] and the Suicide Ideation Questionnaire [SIQ]. Thus, the higher one perceives oneself as disconnected from others and a burden on them, the higher one's desire for death, in the way of suicide.

Besides, convergent validity has revealed that both thwarted belongingness and perceived burdensomeness are positively associated with anxiety and, more especially, depression, with correlations magnitudes being small-to-medium. In fact, depression has been connected to suicide intent for decades (Minkoff, Bergman, Beck, & Beck, 1973). Henceforth, it was expected that both interpersonal theory's constructs, as being related to suicide ideation, would be associated to depression. Previous research has shown that depression, anxiety, and suicide are linked through perceptions of defeat and entrapment (Gilbert & Allan, 1998; Taylor, Gooding, Wood, & Tarrrier, 2011). In our study, the correlations between entrapment and perceived burdensomeness and thwarted belongingness were of medium-to-large magnitudes, which goes in line with previous studies (Forkmann & Teismann, 2017). All these results suggest that higher perceptions of being a burden on others, while feeling disconnected from them, are related to higher anxiety and toned down positive affect (Gilbert, 2006), and perceptions that one has been

defeated, has no escape and no possible rescue (Williams, 2014; Williams & Pollock, 2000). In addition, thwarted belongingness and perceived burdensomeness latent variables were negatively associated with self-compassion and mindfulness, presenting low-to-medium correlation's magnitudes. The ability of being compassionate toward oneself constitutes a completely different self-to-self relationship that the one based on the perception of being a burden on others and feeling disconnected from them. In fact, it is plausible to conclude that one that perceives oneself as a burden on others may relate to her or himself very poorly, in terms of self-care and self-kindness; thus, one may get self-absorbed in such feeling of lack of effectiveness so that one's experiences become separating and isolating, contributing, in addition to the perception of burdensomeness itself, to thwarting of the human universal need to maintain stable and healthy relationships with others. Lastly, the intent to avoid such painful thoughts and feelings may result in an unbalanced awareness of such aversive experiences, based on overidentifying with them. The motivation to escape aversive self-awareness has already been theorized as the fundamental motivator of suicide (Baumeister, 1990). Supporting our findings, the negative link between suicidal ideation and low self-compassion and self-esteem, and negative self-schema and self-comparisons to others has already been made (Collett, Pugh, Waite, & Freeman, 2016).

In our findings, the other construct that was negatively related to suicidal ideation was mindfulness. Previous research also supported this link (Roush, Mitchell, Brown, & Cukrowicz, 2018; Zeng, Ma, & Li, 2017). Additionally, Roush and colleagues (2018) have found that the combination of thwarted belongingness and perceived burdensomeness mediated the relation between the non-judging, act with awareness, and non-reactivity facets of mindfulness (Baer, Smith, Hopkins, Krietemeyer, & Toney, 2006) and suicide ideation. This suggests that the capability to observe and not judge the awareness that arises from paying attention, purposely, in the present moment (Kabat-Zinn, 2018) may be useful in fighting against suicidal desire. More specifically, accepting an experience, such as that of the combination of thwarted belongingness and perceived burdensomeness, "might include refraining from judgements or self-criticism about having this experience (nonjudging) and refraining from impulsive reactions to the experience (nonreactivity)" (Baer et al., 2006; p. 42). Furthermore, results regarding a modified program of Mindfulness-Based Cognitive Therapy (MBCT) showed that MBCT had a larger effect on reducing suicidal despair, when compared to two other

groups that received Cognitive Psychoeducation (CPE) and Treatment-as-Usual (TAU), beyond any changes in depression levels (Williams, Fennell, Barnhofer, Crane, & Silverton, 2015). Moreover, “following MBCT, suicidal cognitions are less likely to increase as depressive symptoms reoccur” (Williams et al., 2015; p. 301).

The INQ-12 also possessed good reliability, with Cronbach’s alphas presenting a coefficient of .91 for the perceived burdensomeness subscale and a coefficient of .85 for the thwarted belongingness subscale. These results support the internal consistency of the measure. Moreover, regarding gender differences, no such differences were observed in perceived burdensomeness and thwarted belongingness.

Lastly, in this study, we tested the contribution of desire for suicide (or the synergy hypothesis) in predicting suicidal ideation, and we tested this hypothesis in two ways. First, we examined the independent and interactive associations of the IPTS constructs (perceived burdensomeness and thwarted belongingness) on the likelihood that respondents would report that they had suicidal ideation throughout their career, after controlling for sex and years as firefighters, via a direct logistic regression. Second, through a hierarchical multiple linear regression, we measured the independent and interactive aptitude of perceived burdensomeness and thwarted belongingness to predict levels of the severity of suicidal ideation throughout the career, after controlling for depression, and the quadratic and cubic terms of the two interpersonal latent variables. Regarding the logistic regression, results demonstrated that neither thwarted belongingness, nor perceived burdensomeness accounted for the likelihood that a firefighter would report having some suicidal ideation throughout her or his career. Moreover, the interaction between thwarted belongingness and perceived burdensomeness was also non-significant, which goes against the predictions of the interpersonal theory. The results remained the same when no covariates (sex and years as firefighter) were entered in the regression. Contrariwise, on the multiple linear regression, the linear term of perceived burdensomeness was significant. Despite the standardized regression coefficient ( $\beta$ ) being negative, that is due to the inverse transformation applied to the perceived burdensomeness variable. Thus, the results must be inversely interpreted. Ergo, the significant effects of perceived burdensomeness on the severity of suicidal ideation that a firefighter had suffered throughout her or his career are in line with the assumption of the interpersonal theory. The linear association between perceived

burdensomeness and suicidal ideation has already been observed (Cero et al., 2015). In addition, despite thwarted belongingness didn't show a linear significant effect, the quadratic and cubic effects of an unmet need to belong showed to be statistically significant. To our knowledge, only another study has investigated the nonlinear relationship between the interpersonal theory variables and suicidal ideation, which may account for the inconsistency observed regarding the synergy hypothesis (Cero et al., 2015). Nevertheless, it is important to control for the appropriate product and, for example, quadratic terms simultaneously, for the observed interactive or curvilinear relationships may not be significant when such relationships actually exist (Ganzach, 1997). The nonlinear effects of thwarted belongingness and perceived burdensomeness are also theoretically plausible, as Cero and colleagues (2015) write, "in the case of thwarted belongingness, a child who loses one parent is not likely at exactly half the suicide risk of a child losing two" (p. 545). In fact, our results suggest that the relationship between thwarted belongingness and the severity of suicidal ideation throughout the career is indeed nonlinear. Hence, given these results, a new way of calculating the interaction between linear perceived burdensomeness and nonlinear thwarted belongingness is offered, although, in this study, the results of this interaction remained non-significant, which goes against the predictions of the interpersonal theory. One reason this interaction may have remained non-significant was possibly due to lack of adequate power, given the relatively small sample that was used.

### **Strengths and limitations**

The current study possesses some strengths, such as: 1) it is theory-driven, which, unlike merely exploratory or non-theory-driven work, allows to guide conclusions through an underlying theoretical framework; 2) to our knowledge, it is the first study that actually confirmed the two-factor structure of the INQ among a current Portuguese firefighters sample; 3) we report not only the CFA indices, but also other psychometric properties of the measure, such as convergent validity, while including negatively associated psychological constructs (mindfulness and self-compassion), which enhances knowledge about thwarted interpersonal needs; and 4) we offer a new way of calculating the nonlinear interaction between thwarted belongingness and perceived burdensomeness, based on the significant quadratic and cubic terms of thwarted belongingness, which, given the limited evidence for such interaction, may be of utmost

importance. Future studies may have in account such nonlinear interaction when testing for the interpersonal theory's synergy hypothesis. Nevertheless, the study possessed some methodological limitations. First of all, only a relatively small sample of current firefighters was utilized, which limits the generalisation to other populations, such as, for example, clinical ones. Thus, no comparison group was used. Second, a small incidence of reported suicidal ideation throughout the career was observed (14.8%), when compared to other studies pointing out that firefighters are a high-risk population for suicide-related cognitions and behaviours (Stanley et al., 2015, 2016). However, it is important to note that this incidence is considerably higher than the cross-national lifetime prevalence in the general population (9.2%; Nock et al., 2008). Third, there was a significant discrepancy between assessed women and men, which may bias the gender differences and result in loss of effect power and representativeness. Finally, fourth, since the assessment protocol was only administered once, we were not able to evaluate the test-retest reliability of the INQ-12. Future studies are also recommended to use larger sample sizes, an equal number of women and men and examine the test-retest reliability of the INQ-12 when investigating suicide risk among different populations (*e.g.*, adolescents, elders and clinical groups).

### **Clinical implications and future directions**

The negative link between both mindfulness and self-compassion and both thwarted belongingness and perceived burdensomeness, and, of course, between mindfulness and self-compassion and suicidal ideation as well, have important clinical utilities. Patients suffering from the perception of being a burden on close others, such as family members or friends, and/or sensing an unmet need to belong may become intertwined with such perceptions and, as the interpersonal theory poses, with thoughts about suicide. Therefore, it is plausible to assume that nourishing an attitude based on compassion, kindness and care towards oneself, while not overidentifying with the pain that one feels when things go a wrong turn and judging or criticising oneself for one's flaws and inadequacies may be fundamental to sooth the patient's pain and her or his perception of a thwarted effectiveness need. This may be due to a cycle of self-criticism, self-condemnation and self-persecuting one may become trapped in when such need of effectiveness becomes thwarted. Besides, the concept of self-compassion itself, as



proposed by Neff (2003), entails the negative component of isolation; thus, by enhancing compassion towards the self, it is possible to directly diminish the perception of failing in the need to belong. Henceforth, ideally through a path analysis framework, future studies may focus on the relation between the forms of self-criticism/self-reassuring, feelings of shame, perceptions of being inferior to others, self-aversion, suicidal ideation, and thwarted belongingness and perceived burdensomeness. Mindfulness was also negatively related to both thwarted belongingness and perceived burdensomeness, and suicidal ideation. By practicing mindfulness meditation, suicidal patients may become more aware of their pain and may learn a more adaptive way of coping with painful thoughts, by being with such thoughts and letting them go, instead of becoming intertwined or overidentified with them and isolated. Therefore, Compassion-Focused Therapy (Gilbert, 2014) and Mindfulness-Based Cognitive Therapy (Williams et al., 2015) are two prominent psychotherapeutic approaches that may be of clinical usefulness to help patients dealing with perceptions of burdensomeness and thwarted belongingness, and, by extension, serious suicidal ideation.

In conclusion, notwithstanding our limitations, there is evidence in the present study that the Portuguese version of the INQ-12 possesses good psychometric properties. Then, its careful use for the assessment of suicide risk in both research and clinical settings is recommended.

## References

- Baer, R. A., Smith, G. T., Hopkins, J., Krietemeyer, J., & Toney, L. (2006). Using self-report assessment methods to explore facets of mindfulness. *Assessment, 13*(1), 27–45. <https://doi.org/10.1177/1073191105283504>
- Barzilay, S., Feldman, D., Snir, A., Apter, A., Carli, V., Hoven, C. W., ... Wasserman, D. (2015). The interpersonal theory of suicide and adolescent suicidal behavior. *Journal of Affective Disorders, 183*, 68–74. <https://doi.org/10.1016/j.jad.2015.04.047>
- Batterham, P. J., Walker, J., Leach, L. S., Ma, J., Calear, A. L., & Christensen, H. (2018). A longitudinal test of the predictions of the interpersonal-psychological theory of suicidal behaviour for passive and active suicidal ideation in a large community-based cohort. *Journal of Affective Disorders, 227*, 97–102. <https://doi.org/10.1016/j.jad.2017.10.005>
- Baumeister, R. F. (1990). Suicide as escape from self. *Psychological Review, 97*(1), 90–113. <https://doi.org/10.1037/0033-295X.97.1.90>
- Baumeister, R. F., & Leary, M. R. (1995). The Need to Belong: Desire for Interpersonal Attachments as a Fundamental Human Motivation. *Psychological Bulletin, 117*(3), 497–529. <https://doi.org/10.1037/0033-2909.117.3.497>
- Beck, A. T., & Steer, R. A. (1991). *Manual for the Beck Scale for Suicide Ideation*. San Antonio, TX: Psychological Corp.
- Bender, T. W., Gordon, K. H., Bresin, K., & Joiner, T. E. (2011). Impulsivity and suicidality: The mediating role of painful and provocative experiences. *Journal of Affective Disorders, 129*(1–3), 301–307. <https://doi.org/10.1016/j.jad.2010.07.023>
- Bishop, S. R., Lau, M., Shapiro, S., Carlson, L., Anderson N. D., Carmody, J., Segal, Z. V., Abbey, S., Speca, M., Velting, D., & Devins, G. (2004). Mindfulness: a proposed operational definition. *Clinical Psychology: Science and Practice, 11*, 230–240.
- Brown, S. L., Roush, J. F., Mitchell, S. M., & Cukrowicz, K. C. (2017). Suicide Risk Among BDSM Practitioners: The Role of Acquired Capability for Suicide. *Journal of Clinical Psychology, 73*(12), 1642–1654. <https://doi.org/10.1002/jclp.22461>

- Brown, T. A. (2015). *Confirmatory Factor Analysis for Applied Research* (Second Ed.). New York: The Guilford Press. <https://doi.org/10.1198/tas.2008.s98>
- Bryan, C. J., Morrow, C. E., Anestis, M. D., & Joiner, T. E. (2010). A preliminary test of the interpersonal-psychological theory of suicidal behavior in a military sample. *Personality and Individual Differences*, 48(3), 347–350. <https://doi.org/10.1016/j.paid.2009.10.023>
- Buitron, V., Hill, R. M., Pettit, J. W., Green, K. L., Hatkevich, C., & Sharp, C. (2016). Interpersonal stress and suicidal ideation in adolescence: An indirect association through perceived burdensomeness toward others. *Journal of Affective Disorders*, 190, 143–149. <https://doi.org/10.1016/j.jad.2015.09.077>
- Campos, R. C., & Holden, R. R. (2016). Testing a Theory-Based Model of Suicidality in a Community Sample. *Omega - Journal of Death and Dying*, 74(2), 119–137. <https://doi.org/10.1177/0030222815598428>
- Carvalho, S., Gouveia, J. P., Castilho, P., & Pimentel, P. (2011). Entrapment: concept, definition and psychometric characteristics of Portuguese version for the Entrapment Scale. *Psychologica*, (54), 385–411. [https://doi.org/10.14195/1647-8606\\_54\\_15](https://doi.org/10.14195/1647-8606_54_15)
- Castilho, P., Carreiras, D., & Pinto, A.M., (2019). *Psychometric properties of a new scale measuring suicidality: the Suicidality Scale*. Manuscript in preparation
- Castilho, P., Pinto-Gouveia, J., & Duarte, J. (2015). Evaluating the Multifactor Structure of the Long and Short Versions of the Self-Compassion Scale in a Clinical Sample. *Journal of Clinical Psychology*, 1-15. DOI:10.1002/jclp.22187
- Cero, I., Zuromski, K. L., Witte, T. K., Ribeiro, J. D., & Joiner, T. E. (2015). Perceived burdensomeness, thwarted belongingness, and suicide ideation: Re-examination of the Interpersonal-Psychological Theory in two samples. *Psychiatry Research*, 228(3), 544–550. <https://doi.org/10.1016/j.psychres.2015.05.055>
- Christensen, H., Batterham, P. J., Mackinnon, A. J., Donker, T., & Soubelet, A. (2014). Predictors of the risk factors for suicide identified by the interpersonal-psychological theory of suicidal behaviour. *Psychiatry Research*, 219(2), 290–297. <https://doi.org/10.1016/j.psychres.2014.05.029>
- Christensen, H., Batterham, P. J., Soubelet, A., & MacKinnon, A. J. (2013). A test of the Interpersonal Theory of Suicide in a large community-based cohort. *Journal of*

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

*Affective Disorders*, 144(3), 225–234. <https://doi.org/10.1016/j.jad.2012.07.002>

- Chu, C., Buchman-Schmitt, J. M., Hom, M. A., Stanley, I. H., & Joiner, T. E. (2016). A test of the interpersonal theory of suicide in a large sample of current firefighters. *Psychiatry Research*, 240, 26–33. <https://doi.org/10.1016/j.psychres.2016.03.041>
- Chu, C., Buchman-Schmitt, J. M., Stanley, I. H., Hom, M. A., Tucker, R. P., Hagan, C. R., ... Joiner, T. E. (2017). The interpersonal theory of suicide: A systematic review and meta-analysis of a decade of cross-national research. *Psychological Bulletin*, 143(12), 1313–1345. <https://doi.org/10.1037/bul0000123>
- Chu, C., Hom, M. A., Rogers, M. L., Stanley, I. H., Ringer-Moberg, F. B., Podlogar, M. C., ... Joiner, T. E. (2017). Insomnia and suicide-related behaviors: A multi-study investigation of thwarted belongingness as a distinct explanatory factor. *Journal of Affective Disorders*, 208(August 2016), 153–162. <https://doi.org/10.1016/j.jad.2016.08.065>
- Chu, C., Nock, M. K., Hom, M. A., Stanley, I. H., Gai, A. R., Nock, M. K., ... Joiner, T. E. (2018). Non-Suicidal Self-Injury and Suicidal Thoughts and Behaviors: A Study of the Explanatory Roles of the Interpersonal Theory Variables Among Military Service Members and Veterans. *Journal of Consulting and Clinical Psychology*, 86(1), 56–68. <https://doi.org/10.1037/ccp0000262>
- Cohen, J. W. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cohen, J., Cohen, P., West, S. G., & Aiken, L. S. (2003). *Applied Multiple Regression/Correlation Analysis for the Behavioral Sciences* (Third Ed.). New Jersey: Lawrence Erlbaum Associates, Inc.
- Collett, N., Pugh, K., Waite, F., & Freeman, D. (2016). Negative cognitions about the self in patients with persecutory delusions: An empirical study of self-compassion, self-stigma, schematic beliefs, self-esteem, fear of madness, and suicidal ideation. *Psychiatry Research*, 239, 79–84. <https://doi.org/10.1016/j.psychres.2016.02.043>
- Costa, S. F. da, & Campos, R. C. (2018). *Estudos de validação do Interpersonal Needs Questionnaire (INQ-15) para a população portuguesa*. Universidade de Évora.

- Feldman, G., Hayes, A., Kumar, S., Greeson, J., & Laurenceau, J.-P. (2007). Mindfulness and Emotion Regulation: The Development and Initial Validation of the Cognitive and Affective Mindfulness Scale-Revised (CAMS-R). *Journal of Psychopathology and Behavioral Assessment*, 29(3), 177–190. <https://doi.org/10.1007/s10862-006-9035-8>
- Forkmann, T., & Teismann, T. (2017). Entrapment, perceived burdensomeness and thwarted belongingness as predictors of suicide ideation. *Psychiatry Research*, 257(July), 84–86. <https://doi.org/10.1016/j.psychres.2017.07.031>
- Gallyer, A. J., Dougherty, S. P., Gai, A. R., Stanley, I. H., Hom, M. A., Rogers, M. L., ... Joiner, T. E. (2018). Problematic alcohol use and suicidal ideation among firefighters: A multi-study investigation of the explanatory roles of perceived burdensomeness and thwarted belongingness. *Journal of Affective Disorders*, 238(December 2017), 281–288. <https://doi.org/10.1016/j.jad.2018.05.045>
- Ganzach, Y. (1997). Misleading Interaction and Curvilinear Terms. *Psychological Methods*, 2(3), 235–247. <https://doi.org/10.1037/1082-989X.2.3.235>
- Gilbert, P. (2006). Evolution and depression: Issues and implications. *Psychological Medicine*, 36(3), 287–297. <https://doi.org/10.1017/S0033291705006112>
- Gilbert, P. (2014). The origins and nature of compassion focused therapy. *British Journal of Clinical Psychology*, 53(1), 6–41. <https://doi.org/10.1111/bjc.12043>
- Gilbert, P., & Allan, S. (1998). The role of defeat and entrapment (arrested flight) in depression: An exploration of an evolutionary view. *Psychological Medicine*, 28(3), 585–598. <https://doi.org/10.1017/S0033291798006710>
- Hawkins, K. A., Hames, J. L., Ribeiro, J. D., Silva, C., Joiner, T. E., & Cugle, J. R. (2014). An examination of the relationship between anger and suicide risk through the lens of the interpersonal theory of suicide. *Journal of Psychiatric Research*, 50(1), 59–65. <https://doi.org/10.1016/j.jpsychires.2013.12.005>
- Heisel, M. J., & Flett, G. L. (2006). The development and initial validation of the Geriatric Suicide Ideation Scale. *The American Journal of Geriatric Psychiatry*, 14, 742–751. [doi:10.1097/01.JGP.0000218699.27899.f9](https://doi.org/10.1097/01.JGP.0000218699.27899.f9)

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

- Holden, R. R., Mehta, K., Cunningham, E. J., & McLeod, L. D. (2001). Development and preliminary validation of a Scale of Psychache. *Canadian Journal of Behavioural Science*, 33, 224-232. DOI: <https://doi.org/10.1037/h0087144>
- Hom, M. A., Chu, C., Schneider, M. E., Lim, I. C., Hirsch, J. K., Gutierrez, P. M., & Joiner, T. E. (2017). Thwarted belongingness as an explanatory link between insomnia symptoms and suicidal ideation: Findings from three samples of military service members and veterans. *Journal of Affective Disorders*, 209(August 2016), 114–123. <https://doi.org/10.1016/j.jad.2016.11.032>
- Hom, M. A., Stanley, I. H., Ringer, F. B., & Joiner, T. E. (2016). Mental Health Service Use Among Firefighters With Suicidal Thoughts and Behaviors. *Psychiatric Services*, 67(6), 688–691. <https://doi.org/10.1176/appi.ps.201500177>
- Hooper, D., Coughlan, J., & Mullen, M. (2008). Structural equation modelling: Guidelines for determining model fit. *Electronic Journal of Business Research Methods*, 6(1), 53–60. <https://doi.org/10.1037/1082-989X.12.1.58>
- Hu, L.-T., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1–55. <https://doi.org/10.1080/10705519909540118>
- Joiner, T. E. (2005). *Why people die by suicide* (1st ed.). Cambridge, Massachusetts: Harvard University Press.
- Kabat-Zinn, Jon (2018). *Meditation Is Not What You Think: Mindfulness and why it is so important*. New York: Hachette Book Group.
- Kleiman, E. M., Turner, B. J., Fedor, S., Beale, E. E., Picard, R. W., Huffman, J. C., & Nock, M. K. (2018). Digital phenotyping of suicidal thoughts. *Depression and Anxiety*, 35(7), 601–608. <https://doi.org/10.1002/da.22730>
- Kline, R. B. (2016). *Principles and Practices of Structural Equation Modeling* (Fourth Ed.). New York: The Guilford Press.
- Klonsky, E. D., & May, A. M. (2014). Differentiating suicide attempters from suicide ideators: A critical frontier for suicidology research. *Suicide and Life-Threatening Behavior*, 44(1), 1–5. <https://doi.org/10.1111/sltb.12068>

- Klonsky, E. D., & May, A. M. (2015). The Three-Step Theory (3ST): A New Theory of Suicide Rooted in the “Ideation-to-Action” Framework. *International Journal of Cognitive Therapy*, 8(2), 114–129. <https://doi.org/10.1007/s10509-007-9498-4>
- Klonsky, E. D., May, A. M., & Saffer, B. Y. (2016). Suicide, Suicide Attempts, and Suicidal Ideation. *Annu. Rev. Clin. Psychol.*, 12, 307–330. <https://doi.org/10.1146/annurev-clinpsy-021815-093204>
- Klonsky, E. D., Saffer, B. Y., & Bryan, C. J. (2018). Ideation-to-action theories of suicide: a conceptual and empirical update. *Current Opinion in Psychology*, 22, 38–43. <https://doi.org/10.1016/j.copsyc.2017.07.020>
- Kumar, S. M., Feldman, G. C., & Hayes, A. M. (2005). *Change in mindfulness and emotion regulation in an integrative therapy for depression*. Manuscript under review
- Lovibond, P. F., & Lovibond, S. H. (1995). The structure of negative emotional states: comparison of the Depression Anxiety Stress Scales (DASS) with the Beck Depression and Anxiety Inventories. *Behaviour Research and Therapy*, 33(3), 335–343
- Ma, J., Batterham, P. J., Caelear, A. L., & Han, J. (2016). A systematic review of the predictions of the Interpersonal-Psychological Theory of Suicidal Behavior. *Clinical Psychology Review*, 46, 34–45. <https://doi.org/10.1016/j.cpr.2016.04.008>
- Mardia, K. V. (1985). Mardia’s test of multinormality. In S. Kotz & N. L. Johnson (Eds.), *Encyclopedia of statistical sciences* (Vol. 5, pp. 217–221). New York: Wiley
- May, A. M., & Klonsky, E. D. (2016). What Distinguishes Suicide Attempters From Suicide Ideators? A Meta-Analysis of Potential Factors. *Clinical Psychology: Science and Practice*, 23(1), 5–20. <https://doi.org/10.1111/cpsp.12136>
- McPhail, C. M., Walker, J. R., Clara, I., Graff, L. A., Feldman, G. C., & Bernstein, C. N. (2005). *Confirmatory factor analysis of the CAMS-R Mindfulness Scale with the Manitoba Inflammatory Bowel Disorder Cohort*. Manuscript in preparation
- Millner, A. J., Lee, M. D., & Nock, M. K. (2017). Describing and Measuring the Pathway to Suicide Attempts: A Preliminary Study. *Suicide and Life-Threatening Behavior*, 47(3), 353–369. <https://doi.org/10.1111/sltb.12284>

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

- Minkoff, K., Bergman, E., Beck, A. T., & Beck, R. (1973). Hopelessness, Depression, and Attempted Suicide. *American Journal of Psychiatry*, *130*(4), 455–459.
- Murphy, K. R., & Davidshofer, C. O. (1988). *Psychological testing: Principles and applications*. Englewood Cliffs, N.J: Prentice-Hall.
- Neff, K. (2003). The Development and Validation of a Scale to Measure Self-Compassion. *Self and Identity*, *2*, 223–250. <https://doi.org/10.1080/15298860390209035>
- Nock, M. K., Borges, G., Bromet, E. J., Alonso, J., Angermeyer, M., Beautrais, A., ... Williams, D. (2008). Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *British Journal of Psychiatry*, *192*(2), 98–105. <https://doi.org/10.1192/bjp.bp.107.040113>
- O'Connor, R. C. (2011). Towards an Integrated Motivational-Volitional Model of Suicidal Behaviour. In R. C. O'Connor, S. Platt & J. Gordon (Eds.), *International Handbook of Suicide Prevention: Research, Policy and Practice* (pp. 181-198). West Sussex: Wiley-Blackwell.
- O'Connor, R. C., Cleare, S., Eschle, S., Wetherall, K., & Kirtley, O. J. (2016). The Integrated Motivational-Volitional Model of Suicidal Behavior: An Update. In R. C. O'Connor & J. Pirkis (Eds.), *The International Handbook of Suicide Prevention* (2<sup>nd</sup> Ed., pp. 220-240). West Sussex: John Wiley & Sons, Ltd.
- O'Connor, R. C., & Kirtley, O. J. (2018). The Integrated Motivational-Volitional Model of Suicidal Behaviour. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, *373*. <https://doi.org/10.1098/rstb.2017.0268>
- O'Connor, R. C., & Nock, M. K. (2014). The psychology of suicidal behaviour. *The Lancet Psychiatry*, *1*(1), 73–85. [https://doi.org/10.1016/S2215-0366\(14\)70222-6](https://doi.org/10.1016/S2215-0366(14)70222-6)
- Osman, A., Bagge, C. L., Gutierrez, P. M., Konick, L. C., Kopper, B. A., & Barrios, F. X. (2001). The Suicidal Behaviors Questionnaire-Revised (SBQ-R): Validation with clinical and non-clinical samples. *Psychological Assessment*, *8*, 443-454. DOI: <https://doi.org/10.1177/107319110100800409>.
- Pais-Ribeiro, J. L., Honrado, A., & Leal, I. (2004). Contribuição para o estudo da adaptação portuguesa das escalas de ansiedade, depressão e stress (EADS) de 21



- itens de Lovibond e Lovibond. *Psychologica*, 36, 235–246.
- Pallant, J. (2016). *SPSS Survival Manual: A Step By Step Guide to Data Analysis Using SPSS Program* (6th ed.). London, UK: McGraw-Hill Education.
- Radloff, L. S. (1977). The CES-D scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401. DOI: 10.1177/014662167700100306.
- Reynolds, W. (1988). *Suicidal Ideation Questionnaire (SIQ): Professional manual*. Odessa, FL: Psychological Assessment Resources.
- Ribeiro, J. D., Witte, T. K., Van Orden, K. A., Selby, E. A., Gordon, K. H., Bender, T. W., & Joiner, T. E. (2014). Fearlessness about death: The psychometric properties and construct validity of the revision to the acquired capability for suicide scale. *Psychological Assessment*, 26(1), 115–126. <https://doi.org/10.1037/a0034858>
- Roush, J. F., Mitchell, S. M., Brown, S. L., & Cukrowicz, K. C. (2018). Thwarted interpersonal needs mediate the relation between facets of mindfulness and suicide ideation among psychiatric inpatients. *Psychiatry Research*, 265(October 2017), 167–173. <https://doi.org/10.1016/j.psychres.2018.04.026>
- Rudd, M. D. (2006). Fluid Vulnerability Theory: A Cognitive Approach to Understanding the Process of Acute and Chronic Suicide Risk. In T. E. Ellis (Ed.), *Cognition and suicide: Theory, research, and therapy* (pp. 355-368). Washington, DC, US: American Psychological Association. DOI: <http://dx.doi.org/10.1037/11377-016>.
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the Fit of Structural Equation Models: Tests of Significance and Descriptive Goodness-of-Fit Measures. *Methods of Psychological Research Online*, 8(2), 23–74. <https://doi.org/10.1002/0470010940>
- Silva, C., Ribeiro, J. D., & Joiner, T. E. (2015). Mental disorders and thwarted belongingness, perceived burdensomeness, and acquired capability for suicide. *Psychiatry Research*, 226(1), 316–327. <https://doi.org/10.1016/j.psychres.2015.01.008>
- Smith, A. R., Fink, E. L., Anestis, M. D., Ribeiro, J. D., Gordon, K. H., Davis, H., ... Joiner, T. E. (2013). Exercise caution: Over-exercise is associated with suicidality among individuals with disordered eating. *Psychiatry Research*, 206(2–3), 246–255.

*Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*

<https://doi.org/10.1016/j.psychres.2012.11.004>

- Stanley, I. H., Hom, M. A., Hagan, C. R., & Joiner, T. E. (2015). Career prevalence and correlates of suicidal thoughts and behaviors among firefighters. *Journal of Affective Disorders, 187*, 163–171. <https://doi.org/10.1016/j.jad.2015.08.007>
- Stanley, I. H., Hom, M. A., & Joiner, T. E. (2016). A systematic review of suicidal thoughts and behaviors among police officers, firefighters, EMTs, and paramedics. *Clinical Psychology Review, 44*, 25–44. <https://doi.org/10.1016/j.cpr.2015.12.002>
- Suh, S., Ebesutani, C. K., Hagan, C. R., Rogers, M. L., Hom, M. A., Ringer, F. B., ... Joiner, T. E. (2017). Cross-cultural relevance of the Interpersonal Theory of suicide across Korean and U.S. undergraduate students. *Psychiatry Research, 251*(February), 244–252. <https://doi.org/10.1016/j.psychres.2017.02.005>
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using Multivariate Statistics* (Sixth Ed.). Pearson Education, Inc.
- Taylor, P. J., Gooding, P., Wood, A. M., & Tarrier, N. (2011). The Role of Defeat and Entrapment in Depression, Anxiety, and Suicide. *Psychological Bulletin, 137*(3), 391–420. <https://doi.org/10.1037/a0022935>
- Tucker, R. P., Hagan, C. R., Hill, R. M., Shish, M. L., Bagge, C. L., Joiner, T. E., & Wingate, L. R. R. (2018). Empirical extension of the interpersonal theory of suicide: Investigating the role of interpersonal hopelessness. *Psychiatry Research, 259*(June 2017), 427–432. <https://doi.org/10.1016/j.psychres.2017.11.005>
- Ullman, J. B. (2013). Structural Equation Modeling. In B. G. Tabachnick & L. S. Fidell (Eds.), *Using Multivariate Statistics* (6<sup>th</sup> Ed., pp. 681-785). Pearson Education, Inc.
- Van Orden, K. A., Cukrowicz, K. C., Witte, T. K., & Joiner, T. E. (2012). Thwarted belongingness and perceived burdensomeness: Construct validity and psychometric properties of the Interpersonal Needs Questionnaire. *Psychological Assessment, 24*(1), 197–215. <https://doi.org/10.1037/a0025358>
- Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E. (2010). The Interpersonal Theory of Suicide. *Psychological Review, 117*(2), 575–600. <https://doi.org/10.1037/a0018697>

- Van Orden, K. A., Witte, T. K., Gordon, K. H., Bender, T. W., & Joiner, T. E. (2008). Suicidal Desire and the Capability for Suicide: Tests of the Interpersonal-Psychological Theory of Suicidal Behavior Among Adults. *Journal of Consulting and Clinical Psychology, 76*(1), 72–83. <https://doi.org/10.1037/0022-006X.76.1.72>
- Wetherall, K., Cleare, S., Eschle, S., Ferguson, E., O'Connor, D. B., O'Carroll, R. E., & O'Connor, R. C. (2018). From ideation to action: Differentiating between those who think about suicide and those who attempt suicide in a national study of young adults. *Journal of Affective Disorders, 241*, 475–483. <https://doi.org/10.1016/j.jad.2018.07.074>
- Williams, J. M. G. (2014). *Cry of pain: Understanding suicide and the suicidal mind* (3<sup>rd</sup> Ed.). London: Piatkus.
- Williams, J. M. G., Fennell, M., Barnhofer, T., Crane, R., & Silverton, S. (2015). *Mindfulness and the Transformation of Despair: Working with People at Risk of Suicide*. New York: The Guilford Press.
- Williams, J. M. G., & Pollock, L. R. (2000). The Psychology of Suicidal Behaviour. In K. Hawton & K. van Heeringen (Eds.), *The International Handbook of Suicide and Attempted Suicide* (pp. 79-94). West Sussex: John Wiley & Sons.
- Zeng, W., Ma, Z., & Li, H. (2017). Mindfulness and suicidal ideation in Chinese older adults: Perceived stress as mediator. *Social Behavior and Personality, 45*(5), 733–740. <https://doi.org/10.2224/sbp.5807>
- Zimet, G. D., Dahlem, N., Zimet, S., & Farley, G. (1988). The Multidimensional Scale of Perceived Social Support. *Journal of Personality Assessment, 52*, 30–41. DOI: [https://doi.org/10.1207/s15327752jpa5201\\_2](https://doi.org/10.1207/s15327752jpa5201_2)

# Study II

Melo, R., & Castilho, P. (2019). *The impact of aversive childhood experiences, self-criticism and entrapment on desire for suicide*. Manuscript in preparation.

## **The impact of aversive childhood experiences, self-criticism and entrapment on desire for suicide**

### **Authors:**

Rafael de Melo<sup>1\*</sup>

Paula Castilho, PhD.<sup>1,2</sup>

### **Affiliations:**

<sup>1</sup>Faculty of Psychology and Education Sciences, University of Coimbra, Portugal

<sup>2</sup>Center for Research in Neuropsychology and Cognitive Behavioural Intervention (CINEICC).  
Faculty of Psychology and Education Sciences, University of Coimbra, Portugal

---

\*Correspondence concerning this study should be addressed to:

Rafael J. Gonçalves de Melo, Faculdade de Psicologia e de Ciências da Educação, Universidade de Coimbra

Rua do Colégio Novo, Apartado 6153 3001-802 Coimbra, Portugal

E-mail address: rafaeljg.melo@gmail.com

### **Abstract**

There is an undeniable reciprocal causal link between a person's genetic heritage and the environment that person grew in, that person's desires and beliefs and such person's behaviour. The Interpersonal-Psychological Theory of suicidal behaviours proposes that suicidal individuals may desire for death, instead of desiring for life, and that such suicidal desire is proximally derived through particular interpersonal states – thwarted belongingness and perceived burdensomeness. Previous research has evidenced that firefighters are at greater risk of experiencing suicide-related behaviours. In this study, we unveiled the contribution of additional psychological constructs, especially those regarding a noxious early environment and evolutionary-shaped behavioural defensive responses included in our genetic repertoire, to the interpersonal theory's desire for suicide. So, we intended to examine the extent to which early experiences of threat, subordination and devaluation may impact on desire for suicide, through self-judgement and entrapment as mediators, among a sample of 169 current Portuguese firefighters. Results of this serial multiple mediator model supported that the overall model was significant, but the strongest mediator was entrapment, when compared to self-judgement. These findings emphasize that perceptions of being trapped and with no possible rescue (entrapment) are an important mechanism operating in the relation between threat and submissiveness during childhood and active suicidal ideation (suicidal desire), beyond self-judgement, and should be addressed in both clinical and research settings.

**Keywords:** entrapment, interpersonal theory of suicide, self-judgement, threat and submissiveness during childhood, mediation.

## **Resumo**

Existe uma ligação causal inegável entre a nossa herança hereditária e o ambiente que nos rodeia, os nossos desejos, crenças e comportamento. A Teoria Interpessoal-Psicológica dos comportamentos suicidários propõe que indivíduos suicidas poderão desejar a morte, ao invés da vida, e que tal desejo de suicídio é proximamente derivado de estados interpessoais específicos – pertença frustrada e percepção de onerosidade. Estudos prévios evidenciaram que os bombeiros estão em maior risco de experienciar comportamentos relacionados com o suicídio. Neste estudo, revelámos a contribuição de construtos psicológicos adicionais, especialmente relacionados com experiências precoces nocivas e respostas comportamentais defensivas evolucionariamente enraizadas no nosso repertório genético, para o desejo de suicídio, numa abordagem interpessoal. Assim, examinámos a extensão na qual experiências precoces de ameaça, subordinação e desvalorização poderão ter impacto no desejo de suicídio, através do autojulgamento e *entrapment* como mediadores, junto de 169 bombeiros Portugueses no ativo. Os resultados deste modelo de mediação múltipla em série suportaram a hipótese de que o modelo se revelou estatisticamente significativo, embora o mediador mais robusto tenha sido o *entrapment*, quando comparado com o autojulgamento. Estes resultados enfatizam que a percepção de estar encurralado e sem resgate possível (*entrapment*) é um mecanismo importante a operar na relação entre experiências de ameaça e subordinação na infância e ideação suicida ativa (desejo de suicídio), para lá do autojulgamento, e que deverá ser tido em conta tanto no contexto clínico, como no de investigação.

**Palavras-Chave:** *entrapment*, teoria interpessoal do suicídio, autojulgamento, experiências precoces de ameaça e subordinação, mediação.

## **Introduction**

One fundamental assumption in philosophy of mind is that the outside, physical world and the mind (inner world) interact with each other in causal links. Thus, in line with this thought, human behaviour is causally derived from one's desires and beliefs, which, in turn, are caused by the genetic repertoire of an agent (a person) and the environment that surrounds the agent since the beginning of her or his existence (Sober, 2005). So, one can be intrigued about what may lead to a person desiring for death, instead of desiring for life, as it may happen with suicidal individuals (Joiner, 2005).

The Interpersonal-Psychological Theory of Suicide (IPT; Joiner, 2005; Van Orden et al., 2010) offers a theoretical framework to the unrolling of suicidal behaviour. The theory states that active suicidal ideation arises proximally from, or is the causal consequence of, two stable and unchanging interpersonal states: thwarted belongingness and perceived burdensomeness. That is to say, according to the theory, that states of thwarted belongingness and perceived burdensomeness *cause*, or lead to, desire for death. Thus, if a person desires for not living, or death, then suicidal behaviour occurs.

Previous literature has revealed that firefighters are at greater risk, when compared to the general population, of exhibiting suicide-related thoughts and behaviours (Stanley, Hom, Hagan, & Joiner, 2015; Stanley, Hom, & Joiner, 2016), given some job-related high-risk occupational hazards (Stanley, Boffa, Hom, Kimbrel, & Joiner, 2017). Specific risk factors that characterize firefighters as a vulnerable group to suicidality are psychopathology (*e.g.*, post-traumatic stress, depression, anxiety; Boffa et al., 2017; Stanley et al., 2017), stigma and barriers to mental-health care access (Haugen, McCrillis, Smid, & Nijdam, 2017), alcohol and psychoactive substances abuse (Gallyer et al., 2018; Martin et al., 2017), sleep dysregulations (*e.g.*, insomnia; Chu et al., 2017), family-work conflict (Cowlshaw, Evans, & McLennan, 2010), and death exposition (Chu, Buchman-Schmitt, Hom, Stanley, & Joiner, 2016). Moreover, Stanley and colleagues (2015) have found the following prevalence estimates of suicide-related behaviours throughout the career of 1027 current and retired northern-American firefighters: 46.8% for suicide ideation, 19.2% for suicide plan, 15.5% for suicide attempt, and 16.4% for non-suicidal self-injury (NSSI), or self-harm. Nevertheless, some unique potential protective factors may include camaraderie, sense of purpose and organizational support (Stanley, Hom, et al., 2016).



In this study, we would like to further build upon the first presented postulation in philosophy of mind: what else, beyond the interpersonal theory's constructs, may contribute to an individual inevitable desiring (or willing) for suicide? Let us look to the genetic repertoire and environment variables, that are, of course, intertwined. In order to do so, one may ground oneself in evolutionary and ethological perspectives. The central paradigm of such approaches applied to human psychology is that current strategies humans employ in situations of conflict were shaped over the course of millions of years, passed on from reptiles to earlier mammals, to primates, and, lastly, to humans (Sloman & Gilbert, 2000). As such, one conflict arena of peculiar importance that early social beings struggled with was conspecific competition, given its nuclear role in some animals (those that have more advantageous characteristics in the fight for survival) passing on their genes to their offspring. When resources such as territory, food, access to breeding partners or, as it happens with humans, social approval and prestige are limited or running short, those who are able to overpower, outwit or entice such resources from others will be at higher odds than those who aren't able of doing it (Sloman & Gilbert, 2000). Hence, *social hierarchies* were originated, based on matrixes of asymmetrical relationships between the individuals of a group (Kaufmann, 1983). The transition from symmetrical to asymmetrical relationships, or to readjust or reinforce already asymmetrical ones, is due to *ritual agonistic behaviour* (RAB; Lorenz, 1981), where an agreed-upon victor and loser emerge (Price & Sloman, 1987).

Later, Sloman and Gilbert (2000) extend these dominance and subordination mechanisms to other relationships, beyond social hierarchies, where may exist conspecific conflict of interest, such as alliance formation, care of offspring, and sibling rivalries and alliances. In such relationships, sometimes to act submissively may be of more advantage than to further contest the allocation of resources. As Sloman and Gilbert (2000) write, “[t]he benefits outweigh the costs”, and, henceforth, this yielding, submissive behaviour is not necessarily pathological. However, quite often this is not the case. One may strongly desire more status, care, sex or support than one is currently receiving, but losing in the encounter to obtain such things. Thus, amongst others, a wide variety of *involuntary subordinate strategies* (Price, Sloman, Gardner, Gilbert, & Rohde, 1994; Taylor, Gooding, Wood, & TARRIER, 2011) compose the evolutionary-shaped behavioural repertoire of social animals. Regarding humans, this “genetically hard-wired

psychobiological response to perceptions of defeat” (Taylor et al., 2011; p. 394) has been more recently called the *involuntary defeat strategy* (IDS; Sloman, 2000).

The simplest of such strategies, common to many animal species, is flight or escape (Dixon, 1998; Dixon, Fisch, Huber, & Walser, 1989; Taylor et al., 2011). Nevertheless, it is possible to an animal being prevented from escaping the conflict situation, *e.g.*, because there are no escape routes. Then, the escape is blocked, which is particularly noxious for the losing animal, as described by Schjelderup-Ebbe (1935) and his birds’ pecking order. Notwithstanding, in situations of *blocked escape*, Dixon and colleagues (1989) have found a peculiar kind of social defensive behaviour, which they termed *arrested flight*. The arrested flight strategy “involves suppression of explorative behaviour (especially approach), submissive/static postures (to reduce outputs) cut-off (to reduce inputs) and severe demobilization” (Gilbert & Allan, 1998; p. 588). Similar to the construct of arrested flight, but far more toxic, Williams (2014) has suggested the term *entrapment*, as meaning “anything that stops an animal or human from getting away when it wants to flee” (p. 152). According to Mark Williams (1997, 2001, 2014; Williams & Pollock, 2000), the perception that one has been defeated, has no escape and no possible rescue is fundamental to suicidal behaviour, which, in turn, is considered as a “cry of pain”. Based on the works of Williams, more recently Rory O’Connor has undertaken entrapment as an important motivator in the course to suicide ideation in his integrated motivational-volitional model (IMV) of suicidal behaviour (O’Connor 2011; O’Connor, Clear, Eschle, Wetherall, & Kirtley, 2016; O’Connor & Kirtley, 2018; O’Connor & Portzky, 2018). The concept of entrapment specific to the states of thwarted belongingness and perceived burdensomeness may be theoretically and clinically important to account for, beyond hopelessness, as Gilbert and Allan (1998) write, “since helpless does not itself speak to any underlying flight motivation (*e.g.* running away)” (p. 588), which the states of thwarted interpersonal needs may induce in the suicidal ideator.

It is important to note that the arrested flight strategy is an adaptive social defensive behaviour, through which the defeated, loser or lower-rank animal may send no-threat signals to the stronger, more dominant animal (Gilbert, 2000). As such, it may be of advantage to the subordinate animal in a short-term period. On the contrary, entrapment is considered to be a

longer term state, first because external causes of stress are themselves long term (e.g., the person is trapped by bullying peers or partners). But it may be prolonged also because the person has grown up in an environment where he or she could exercise very little control, where others had all the power, so the person has learned over a long time period that the only possible response option is to submit. The person is thus extra-sensitive to social threats, and their world constantly seems to present fewer alternatives for action, whatever the reality. (Williams, 2014; p. 153)

Thus, prior research has linked children that live in environments marked by threats of down rank and to act submissively as more susceptible to depression (Gilbert, Cheung, Grandfield, Campey, & Irons, 2003), but it is unclear if such recall may be linked to suicidal ideation or even to lethal or near-lethal suicide attempt(s). According to the social rank theory (SRT, Price, 1972), “child-parent relationships are also power relationships”, contrasting to Bowlby’s attachment theory that focus on parental control over their offspring or rather on the absence of care, proximity and warmth (Gilbert et al., 2003; p. 109). So, as a power relationship, child-parent relationships may be ruled by the perception that one cannot escape to such threatening environment and has no other choice than to act in subordinate ways. This may lead to inability to escape and a tendency to feel trapped in such aversive relationship, which relates to the concept of entrapment (Gilbert et al., 2003). In addition, a rank-focused mentality may lead to nourishing self-judgement, or self-criticism, as a defensive mechanism, related to submission, that may ultimately lead to internal entrapment, which increases the vulnerability to depression, hopelessness and suicide (Gilbert et al., 2001; Sturman & Mongrain, 2005; Taylor et al., 2011). Moreover, in a recent systematic review, evidence, albeit limited, was shown regarding the negative relation between social rank and suicidal ideation and self-harm; in this way, higher suicidal ideation and self-harm were linked to lower perceived social rank (Wetherall, Robb, & O’Connor, 2019).

There may be a second way entrapment may be an important mechanism that must be taken into consideration. The large human brain is an evolved product, especially designed to deal with social processing (Gilbert, 2014) and, henceforth, social threats. As may be noticeable, the states of thwarted interpersonal needs, that, according to Joiner (2005), are effectiveness and connectedness, may compose a social threat. In fact, one

perceiving to be so ineffective that closed ones are burdened and threatened, and to have an unmet need to belong, either because relationships are unstable or unpleasant, or one “may not feel connected to others or cared about” (Joiner, 2005; p. 97) may indicate that one is losing this social encounter – one is at a low-rank position, is regarded by oneself as inferior or has undesirable characteristics to others. Furthermore, in attachment theory, it has been proposed that representations of attachment figures’ responses incorporated into the self-concept lead an individual to treat her or himself the way that attachment figures treated her or him (Mikulincer & Shaver, 2004, 2016). That is to say, by having a highly socially oriented brain, one relates to oneself as one relates to others, and it is the relationship one has with oneself that underpins mental health problems (Gilbert, 2014). It has also been suggested people who die by suicide are simultaneously killer and victim (Menninger, 1938; Joiner & Stanley, 2016). Thus, in a recent article, Joiner and Stanley (2016) argue that a suicidal crisis can be viewed as a range of antipredator defensive reactions “all the more because the killer is close at hand and inescapable” (p. 107), namely overarousal and shutdown phenomena. The fundamental premise is that, in predation scenarios, where predation behaviour “is the process through which an animal (the predator) captures and kills another animal (the prey) before eating the latter in part or completely” (Minelli, 2008; p. 2923), various animal species, such as mammals, activate defensive reactions to deal with such predation threats. As Joiner and Stanley (2016) put it, “it may not matter, in terms of triggering an antipredator mind-set, that their killer is they” (p. 107). Therefore, one may argue the self-to-self relationship in suicidal ideators is tainted by a predator-prey relationship, in which the suicidal ideator is both the predator and the prey. Besides, since self-to-self relationships exist intrinsically to any (living) individual, the suicidal ideator may be trapped in such predation scenario, one occurring within her or himself, which resembles, once again, the concept of entrapment.

In conclusion, according to the interpersonal theory of suicide, the suicidal ideator is determined to will for death. The interpersonal theory posits that hopelessness regarding thwarted belongingness and perceived burdensomeness interact with each other and lead to suicidal desire. However, the suicidal ideator may also be determined to will for death due to evolutionary-shaped behavioural responses, inscribed in our genes, and the environment that she or he grew in. Thus, the perception of entrapment seems of unique importance so that suicidal ideation, or even suicidal behaviours, occur. More

specifically, we argue that the inability to escape – feeling defeated by, trapped in and without rescue from – the state of thwarted interpersonal needs (thwarted belongingness and perceived burdensomeness) may be of singular importance to account for. Moreover, a noxious early environment as one ruled by threat and submissiveness may extend the perception of entrapment, and that one has no other choice than to submit, in this case, to the predator, which is the suicide ideator her or himself.

So, in our study, we aimed to unveil the contribution of these psychological mechanisms that may also account for the interpersonal theory's desire for suicide. In order to do so, we tested a serial multiple mediator model, in which recall of aversive childhood experiences, such as threat and submissiveness, is modelled as affecting desire for suicide through self-judgement and entrapment.

## **Method**

### **Participants and Procedure**

Participants were 169 current Portuguese firefighters, recruited both via email and in person, across a convenient range of fire stations. Of these 169 firefighters, 134 were male (79.3%) and 35 were female (20.7%). The overall mean age was 33.27 years ( $SD = 10.31$ ; range: 18-62). Approximately half of participants had never been married (49.1%) and 47 participants (27.8%) were married. Regarding education, 56.8% ( $N = 96$ ) of individuals completed the 12<sup>th</sup> grade (overall mean complete years of education was 12.03;  $SD = 2.532$ ; Range: 4-19), and only 17.8% ( $N = 30$ ) had some college degree. Of 33 (20.5%) individuals that reported previous or current military service, 28 responded that were never exposed to war scenarios. Concerning the firefighter career, the majority (87.0%) was volunteer and, among these, 78 (78.8%) reported as being fire station's employees. The mean years of service as firefighter was 12.38 years ( $SD = 10.054$ ; Range: 1-44). About 14.8% of participants reported some previous or current suicidal ideation throughout the career, with nearly 3% of respondents reporting at least one suicide attempt. Gender differences regarding some important variables are shown in Table 1.

*The impact of aversive childhood experiences, self-criticism and entrapment on desire for suicide*

**Table 1** - Sample's demographic characteristics and gender differences regarding some important variables.

	Male (N = 134)		Female (N = 35)		<i>t</i>	<i>p</i> *	<i>d</i>
	M	SD	M	SD			
<b>Age</b>	34.77 (N = 128)	10.386	27.77 (N = 35)	7.971	-4.295	.000	0.756
<b>Education (Years)</b>	11.71 (N = 117)	2.436	13.27 (N = 30)	2.559	3.092	.002	-0.624
<b>Career (Years)</b>	13.67 (N = 128)	10.486	7.22 (N = 32)	5.802	-4.668	.000	0.761
	n	Valid %	n	Valid %	$\chi^2$	<i>p</i> *	<i>V</i>
<b>Marital Status</b>	(N = 134)		(N = 35)		20.929	.000	.352
Never married	54	40.3	29	82.9			
Married	45	33.6	2	5.7			
Together	23	17.2	2	5.7			
Separated	-	-	-	-			
Divorced	11	8.2	2	5.7			
Widowed	1	0.7	-	-			
<b>Firefighter Rank</b>	(N = 110)		(N = 24)		12.780	.078	.309
Recruit	8	7.3	-	-			
3 <sup>rd</sup> Rank	44	40.0	18	75.0			
2 <sup>nd</sup> Rank	23	20.9	5	20.8			
1 <sup>st</sup> Rank	16	14.5	1	4.2			
Sub-chief	8	7.3	-	-			
Chief	6	5.5	-	-			
Commanding Officers	5	4.5	-	-			

\*two-tailed *p* value.

We started by contacting all eighteen District Commands of the National Authority for Emergency and Civil Protection (ANEPC) all over Portugal Continental, aiming to reach current firefighters through a web-based survey (a Limesurvey link), sent via email, as well as the National School of Firefighters (ENB). Concerning the web-based survey, participants were initially presented with a consent form built upon the

most recent version of the Declaration of Helsinki; then, each participant had to tick a “Yes” or “No” option, offering informed consent. Only if the participant chose “Yes”, he or she would proceed with the survey. At the end of the survey, a psychoeducational form was presented. Briefly, this form alerted that suicide-related thoughts and behaviours are, in themselves, reasons to seek help. In line with this, numerous national contacts and resources were presented, including the European Union emergency telephone number, 112, for more emergent situations. This psychoeducational form was presented nonetheless the participant’s response to the informed consent, even if he or she would choose “No”. The web-based survey had an estimated time of completion of about 20 minutes. Also, participants who provided their email address following survey completion are eligible to win a 49.99€ prize to be drawn when the research is completed.

Notwithstanding our efforts, only 11 responses to the web-based survey were collected, representing only 5.3% of the total responses. Hence, a total of 198 participants (94.7%) were recruited personally, through paper form, from various convenient fire stations across the Centre (mainly) and Alentejo regions of Portugal. The paper form followed the structure of the web-based survey. Of these 209 responses, 40 were not considered viable due to several missing data or a notoriously biased response style. At the end, the sample contains data from 169 current Portuguese firefighters. Importantly, all respondents were invited to voluntarily participate in the present research. Moreover, confidentiality and anonymity of all data was assured, being emphasised that the data was only used for the purpose of the study.

## **Measures**

*Demographics Overview.* A demographics overview questionnaire was made and aimed to assess sociodemographic (e.g., marital status, sex, education level) and firefighter occupational characteristics (e.g., firefighter rank, years serving as firefighter).

*Interpersonal Needs Questionnaire – 12 (INQ;* Van Orden, Cukrowicz, Witte, & Joiner, 2012; Portuguese version by Melo & Castilho, 2019). The INQ is an instrument that measures two proximal factors for desire for suicide, thwarted belongingness and perceived burdensomeness, as proposed by the Interpersonal-Psychological Theory of suicidal behaviours (IPTS; Joiner, 2005; Van Orden et al., 2010; Van Orden, Witte, Gordon, Bender, & Joiner, 2008). The present version of the measure includes 12 items:

*The impact of aversive childhood experiences, self-criticism and entrapment on desire for suicide*

6 items measure the concept of thwarted belongingness (*e.g.*, “These days, I am close to other people”) and 6 items measure perceived burdensomeness (*e.g.*, “These days I think I am a burden on society”). Each item is rated in a Likert-like scale, rated from 1 (“Not at all true for me”) to 7 (“Very true for me”). Therefore, higher total scores for each subscale mean higher either thwarted belongingness or perceived burdensomeness. According to Van Orden and colleagues (2012), the subscales of thwarted belongingness and perceived burdensomeness, regarding internal consistencies, presented Cronbach’s alpha coefficients of .85 and .89, respectively. The 15-item version of the instrument counts with the Portuguese version by (Campos & Holden, 2016). However, as presented in study I, Melo and Castilho (2019) have furthered the calibration of the Portuguese version of the INQ, resulting in the 12-item version that was utilized in the present study. Melo and Castilho (2019) state that the measure possesses adequate psychometric properties concerning internal consistency: alpha coefficients for the thwarted belongingness subscale of .85, and .91 for the perceived burdensomeness subscale.

*Entrapment Scale* (ES; Gilbert & Allan, 1998; Portuguese version by Carvalho, Gouveia, Castilho, & Pimentel, 2011). The Entrapment Scale quantifies the degree of two types of entrapment, internal and external, through a 5-point Likert-like scale, ranging from 0 (“Not at all like me”) to 4 (“Extremely like me”). The internal entrapment (6 items; *e.g.*, “I feel powerless to change myself”) is associated with motivation to escape, which has been triggered by internal aversive feelings and thoughts, contrary to external entrapment (10 items; *e.g.*, “I can see no way out of my current situation”), in which the motivation to escape comes from the perception of threats that are present in the outside world. In the original version, Gilbert and Allan (1998) report good to excellent Cronbach’s alphas for the reliability of the internal entrapment scale (.93 for a student sample, .86 for a depressed group), as well as one extracted factor regarding factor structure, accounting for 74.8% of the variance in the student sample and for 60.5% in the depressed group. For the external entrapment scale, reliability alpha coefficients have been reported by the authors as 0.88 for the student group and 0.89 for the depressed sample, and also one extracted factor (factor structure) accounting for 49.9% of the total variance for the student sample; however, two factors were obtained for the depressed group, later merged into one (correlation between both factors was 0.58). Therefore, higher scores in each subscale represent higher levels of entrapment (internal *vs.* external,



although some authors calculate the total sum of the scale; Carvalho et al., 2011). In the present study, the Cronbach's alpha coefficient for the internal entrapment subscale was .88, for the external entrapment subscale was .90 and for the total scale was .93.

*Early Life Experiences Scale* (ELES; Gilbert, Cheung, Grandfield, Campey, & Irons, 2003; Portuguese version by Lopes & Pinto Gouveia, 2012). The original version of the ELES is meant to measure recall of perceived threat and subordination and in acting in a submissive way in childhood. All the items are rated on a Likert-type scale, ranging from 1 ("Completely untrue") to 5 ("Very true"). The 15 items loaded in three factors through factor analysis: *threat* (6 items; e.g., "The atmosphere at home could suddenly become threatening for no obvious reason"), *submissiveness* (6 items; e.g., "I felt on edge because I was unsure if my parents might get angry with me") and *(un)valued* (3 items; e.g., "I felt an equal member of my family"). In the Portuguese version, it was added an additional item (no. 16, "I was victim of harassment or sexual abuse by members of my family or friends/acquaintances of my family's"), intended to measure the existence and frequency of sexual abuse or harassment during childhood. This way, the scale is thought to include an extra feature of the possible threatening nature or necessity to act in a submissive way in one's family early perceptions. Scores range between 16 and 80, with higher scores meaning more memories of threat, subordination and devaluation during childhood. It's also possible to obtain partial scores for each of the subscales, regarding threat, submissiveness and devaluation (i.e., perceptions of being unvalued). In the original study, Gilbert and colleagues (2003) found a coefficient  $\alpha = 0.92$ , via an initial global scale's reliability analysis, meaning the excellent psychometric properties about internal consistency. In the present study, the overall scale possessed an alpha coefficient of .85.

*Self-Compassion Scale* (SELFCFS; Neff, 2003; Portuguese version by Castilho, Pinto-Gouveia, & Duarte, 2015a). The Self-Compassion Scale is a 5-point Likert scale, ranging from 1 ("Almost never") to 5 ("Almost always"), in which participants rate how often the statements are true. The SELFCFS includes 26 items that measure global self-compassion in six subscales, those being the six components of global self-compassion as defined by Neff (2003): *self-kindness* (five items; e.g. "I try to be understanding and patient towards those aspects of my personality I don't like"), *self-judgment* (five items; e.g. "I can be a bit cold-hearted towards myself when I'm experiencing suffering"),

*The impact of aversive childhood experiences, self-criticism and entrapment on desire for suicide*

*common humanity* (four items; e.g. “I try to see my failings as part of the human condition”), *isolation* (four items; e.g. “When I’m really struggling, I tend to feel like other people must be having an easier time of it”), *mindfulness* (four items; e.g. “When I’m feeling down I try to approach my feelings with curiosity and openness”), and *overidentification* (four items; e.g. “When something upsets me, I get carried away with my feelings”). It is also possible to divide the components or subscales into two major dimensions: a positive one, with positive components (*i.e.*, self-kindness, common humanity and mindfulness), and a negative one, with negative components (*i.e.*, self-judgment, isolation, and overidentification). As for the scores, a total score can be calculated by doing the sum of all items (and reverse-coding for the self-judgment, isolation, and over-identification subscales), as well as average scores for each subscale (partial scores). Higher scores show greater levels of self-compassion. The original version presented good psychometric properties, including adequate reliability of the total scale ( $\alpha_{Total} = .92$ ) and all subscales ( $\alpha_{Self-kindness} = .78$ ;  $\alpha_{Self-judgment} = .77$ ;  $\alpha_{Common\ humanity} = .80$ ;  $\alpha_{Isolation} = .79$ ;  $\alpha_{Mindfulness} = .75$ ;  $\alpha_{Overidentification} = .81$ ; Neff, 2003), with similar values being found in the Portuguese validation study: Cronbach’s alphas for the total scale in the clinical and nonclinical samples were .92 and .94, respectively, and ranged between .70 and .88 for the subscales (Castilho et al., 2015a). In this study, we only made use of the self-judgement subscale, which pointed out an alpha coefficient of .72.

### **Data Analytic Plan and Preliminary Data Analyses**

The present study had a cross-sectional design and all statistical procedures were performed through IBM SPSS Statistics 24 software. Regarding the serial multiple mediator model, analyses were carried out with the PROCESS macro, version 3.3 (2019), written by Hayes (2013), since it offers the bootstrapping inferential method for testing hypotheses about the indirect effect, which are more powerful than (and henceforth recommended over) normal theory-driven assumptions (*e.g.*, Sobel test) about the shape of the sampling distribution of the indirect effect. In this sense, Haye’s macro doesn’t assume normality of the sampling distribution of the indirect effect (Hayes, 2013).

About gender differences in age, number of complete years of education, and number of years of service as firefighter, independent samples Student-*t* tests with Levene’s test for equality of variances were carried out. Moreover, the significance of the

chi-square statistic ( $\chi^2$ ) was utilized to search for differences among marital status and firefighter ranks, between both genders. The level of significance was considered at 5%. In addition, effect sizes for the Student-*t* test (Cohen's *d*) and chi-square (Cramer's *V*) are reported. Concerning interpretation of the effect size statistics' strength, we used Cohen's (1988) criteria for Cohen's *d* (small = 0.2, medium = 0.5, and large = 0.8) and Pallant's (2016) criteria for Cramer's *V* (two categories: small = .01, medium = .30, and large = .50).

About gender differences in all study variables, independent samples Student-*t* tests with Levene's test for equality of variances were performed. Spearman rank order correlations were used to explore associations between all study variables. We made use of Cohen's (1988) criteria to analyse the size of the correlations: small (from .10 to .29), medium (from .30 to .49) and large (from .50 to 1.00).

Since the criterion, desire for suicide, represents the interaction between thwarted belongingness and perceived burdensomeness (Joiner, 2005; Van Orden et al., 2010), such variable was computed via the product of both interpersonal constructs. The variables were not mean-centered prior to the analysis.

A serial multiple mediation approach (Model 6; Hayes, 2013) was used to test the hypothesis that the recall of threat and submissiveness in childhood would be positively associated with desire for suicide (the interaction between perceived burdensomeness and thwarted belongingness), and that this relationship would be mediated by self-judgement and entrapment in serial. Bias-corrected bootstrap confidence intervals for the direct and indirect effects using 10,000 bootstrap samples were utilized to construct intervals at a 95% level of confidence. Statistically significant effects were indicated by a confidence interval *not* containing zero (Hayes, 2013).

Despite this being a cross-sectional design study, in a serial multiple mediator model, contrary to a parallel multiple mediator model, the assumption of no causal association between two (or more) mediators is utterly rejected *a priori* (Hayes, 2013). Then, we hypothesized that self-judgement would cause entrapment: when one is in a prolonged state of self-judgement, one may feel defeated, with no escape and no possible rescue (entrapment) from such cognitive (and emotional) aversive self-to-self relationship. Notwithstanding, an additional "reversed" mediation was undertaken, so that evidence for this premise (and, henceforth, the overall model) would be gathered.

*The impact of aversive childhood experiences, self-criticism and entrapment on desire for suicide*

## Results

Independent samples Student-*t* tests were performed to evaluate gender differences regarding all study variables. Results (presented in Table 2) show statistically significant differences only in self-judgement, pointing out higher scores for women. Although the difference did not reach statistical significance, women also scored higher in desire for suicide and entrapment. However, the recall of threat and submissiveness in childhood was more common among men, despite the difference between men and women was non-significant.

**Table 2** - Means and standard-deviations per gender, and gender differences concerning all study variables.

	Female (N = 35)		Male (N = 134)		<i>t</i>	<i>p</i> *
	M	SD	M	SD		
Threat and Submissiveness in Childhood (ELES)	28.80	8.210	29.84	9.100	-.616	.539
Desire for Suicide (INQ-12)	113.09	77.004	110.60	89.332	.150	.881
Self-Judgement (SCS)	2.63	.836	2.11	.563	3.515	.001
Entrapment (ES)	9.34	11.792	6.42	8.487	1.377	.175

\*two-tailed *p* value.

Spearman rank order correlations (Spearman's rho) between all variables demonstrate significant positive moderate-to-large relationships between all study variables (Table 3).

**Table 3** - Correlation coefficients (two-tailed Spearman's rho) between the study variables.

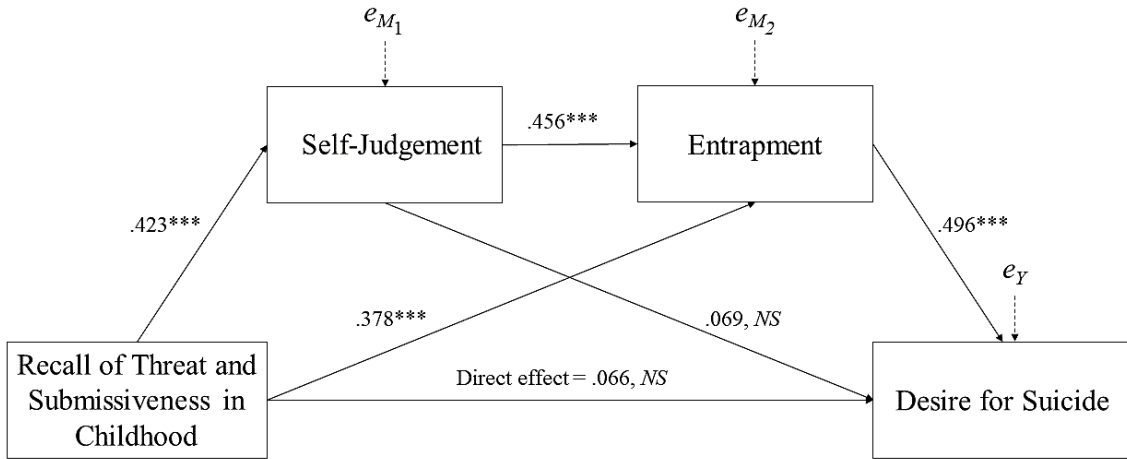
Variable	ELES	INQ-12	SCS	ES
Threat and Submissiveness in Childhood (ELES)	1.000	-	-	-
Desire for Suicide (INQ-12)	.319***	1.000	-	-
Self-Judgement (SCS)	.455***	.369***	1.000	-
Entrapment (ES)	.580***	.468***	.635***	1.000

\*\*\* $p$  (two-tailed)  $\leq .001$ .

### **Serial Multiple Mediator Model**

Our main aim in this study is to unveil the contribution of additional psychological constructs that may account for the interpersonal theory's desire for suicide. So, we tested a serial multiple mediator model, in which the recall of threat and submissiveness in childhood is modelled as affecting desire for suicide through self-judgment and entrapment. In other words, we intended to investigate the direct and indirect effects of the recall of threat and submissiveness in childhood on desire for suicide while modelling the process in which such recall of aversive early experiences causes self-judgment, which in turn causes entrapment, concluding with desire for suicide as the final consequent. The statistical diagram that represents the tested model can be found in Figure 1. Results of the regression coefficients, standard errors, and model summary information for the tested model are presented in Table 4.

**Figure 1** – Statistical diagram demonstrating the mediating effects of self-judgement and entrapment in serial on the relation between the recall of threat and submissiveness in childhood and desire for suicide, with standardized path coefficients reported.



### Total, Direct and Total Indirect Effects

According to Hayes (2013), in a serial multiple mediator model, the total effect of  $X$  on  $Y$  is partitioned into direct and indirect components. The total effect of  $X$  on  $Y$  is usually interpreted as the “estimated difference in  $Y$  between two cases that differ by one unit on  $X$  but who are equal on all mediators in the model” (p. 146), and the indirect effects are “all interpreted as the estimated difference in  $Y$  between two cases that differ by one unit on  $X$  through the causal sequence from  $X$  to mediator(s) to  $Y$ ” (Hayes, 2013; p. 147).

The hypothesis that self-judgement and entrapment would mediate the relationship between the recall of threat and submissiveness in childhood and desire for suicide in serial was fully supported (total model summary:  $F(3, 165) = 28.14, R^2 = 0.34, p < 0.001$ ). More specifically, the *total* effect of self-judgement and entrapment in the relation between the recall of threat and submissiveness in childhood and desire for suicide was significant at the statistical level (95% CI = 2.31, 5.06); on the contrary, the *direct* effect of the recall of threat and submissiveness in childhood and desire for suicide was not significant (95% CI = -0.85, 2.13). In addition, the *total indirect* effect of self-judgement and entrapment in the relation between the recall of threat and submissiveness in childhood and desire for suicide was statistically significant (95% CI = 1.50, 5.40,  $ab_{cs} = 0.31$ ).

**Table 4** - Regression coefficients, standard errors, and model summary information for the tested model.

Predictor Variable	Predicted Variable											
	Self-judgement ( $M_1$ )			Entrapment ( $M_2$ )			Desire for Suicide ( $Y$ )					
	Coeff.	<i>SE</i>	<i>p</i>	Coeff.	<i>SE</i>	<i>p</i>	Coeff.	<i>SE</i>	<i>p</i>			
Aversive early experiences ( $X$ )	$a_1$	0.031	0.005	< 0.001	$a_2$	0.395	0.064	< 0.001	$c'$	0.642	0.755	0.396
Self-judgement ( $M_1$ )	–	–	–	$d_{21}$	6.417	0.855	< 0.001	$b_1$	9.034	10.605	0.396	
Entrapment ( $M_2$ )	–	–	–	–	–	–	–	$b_2$	4.622	0.832	< 0.001	
Constant	$i_{M1}$	1.286	0.161	< 0.001	$i_{M2}$	-18.895	2.091	< 0.001	$i_Y$	39.598	27.370	0.150
	$R^2 = 0.179$			$R^2 = 0.497$			$R^2 = 0.339$					
	$F(1, 167) = 36.477, p < 0.001$			$F(2, 166) = 81.944, p < 0.001$			$F(3, 165) = 28.141, p < 0.001$					

### **Specific Indirect Effects**

In a serial multiple mediator model with two mediators such as the one we tested, there are three specific indirect effects (Hayes, 2013). The specific indirect effect of the recall of threat and submissiveness in childhood on desire for suicide through only self-judgement was non-significant (95% CI = -0.40, 0.90,  $ab_{cs} = 0.03$ ). Contrariwise, the specific indirect effect through entrapment only was significant (95% CI = 0.63, 3.81,  $ab_{cs} = 0.19$ ). Further, the specific indirect effect through both self-judgement and entrapment in serial was significant as well (95% CI = 0.40, 1.68,  $ab_{cs} = 0.10$ ).

### **Additional “Reversed” Mediation Analysis**

In order to further assess the serial multiple mediator model, a reversed mediation analysis was performed. In this reversed analysis, the recall of threat and submissiveness in childhood was maintained as the dependent variable ( $X$ ), since it is a distal timeframe variable. What was changed was the entering order of the mediators in the model. So, the reversed mediation model meant to investigate the indirect effects of the recall of threat and submissiveness in childhood on desire for suicide while modelling the process in which such recall of aversive early experiences causes entrapment, which in turn causes self-judgement, concluding with desire for suicide as the final consequent. Table 5 presents the results of the regression coefficients, standard errors, and model summary information for the reversed model.

The overall model, in which the specific indirect effect through both entrapment and self-judgement in serial was tested, was not significant (95% CI = -0.287, 0.718,  $ab_{cs} = 0.02$ ). Moreover, because the confidence interval also included zero, the specific indirect effect through only self-judgement was non-significant as well (95% CI = -0.144, 0.301,  $ab_{cs} = 0.01$ ). Nevertheless, the specific indirect effect through only entrapment showed statistical significance (95% CI = 1.183, 5.172,  $ab_{cs} = 0.28$ ), once again. These results further support the main model and reinforce the importance of the path that defines the indirect effect of entrapment on the relationship between the recall of aversive early experiences, such as threat and submissiveness, and desire for suicide.



**Table 5** - Regression coefficients, standard errors, and model summary information for the reversed model.

Predictor Variable	Predicted Variable											
	Entrapment ( $M_1$ )			Self-judgement ( $M_2$ )			Desire for Suicide ( $Y$ )					
	Coeff.	<i>SE</i>	<i>p</i>	Coeff.	<i>SE</i>	<i>p</i>	Coeff.	<i>SE</i>	<i>p</i>			
Aversive early experiences ( $X$ )	$a_1$	0.596	0.066	< 0.001	$a_2$	0.008	0.006	0.153	$c'$	0.642	0.755	0.150
Entrapment ( $M_1$ )	–	–	–	$d_{21}$	0.040	0.005	< 0.001	$b_1$	4.622	0.832	0.396	
Self-judgement ( $M_2$ )	–	–	–	–	–	–	–	$b_2$	9.034	10.605	< 0.001	
Constant	$i_{M1}$	-10.646	2.052	< 0.001	$i_{M2}$	1.706	0.150	< 0.001	$i_Y$	39.598	27.370	0.396
	$R^2 = 0.326$			$R^2 = 0.387$			$R^2 = 0.339$					
	$F(1, 167) = 80.815, p < 0.001$			$F(2, 166) = 52.433, p < 0.001$			$F(3, 165) = 28.141, p < 0.001$					

## **Discussion**

The fundamental premise of philosophy of mind on which we built upon, that the genetic repertoire of an agent and the environment that constantly surrounds such agent cause the agent's desires and beliefs, which, in turn, cause the agent's behaviour (Sober, 2005), is intimately shared by the cognitive-behaviour psychotherapies. In the psychology of suicidal behaviour, research on factors implicated in the aetiology and course of suicidality have revealed several cognitive factors, such as problem-solving deficits, negative cognitive style, and memory and thinking biases (Williams & Pollock, 2002). Other psychological mechanisms that have been related to suicidality are entrapment (Williams, 2014) and self-criticism (O'Connor, 2007; O'Connor & Noyce, 2008). Moreover, recent research has pointed out firefighters as being at higher than normal population risk to experience suicidal thoughts and behaviours (Stanley et al., 2015; Stanley, Hom, et al., 2016).

The Interpersonal-Psychological Theory of Suicide (Joiner, 2005; Van Orden et al., 2010) posits that a person (an agent) that suffers from two unchanging interpersonal states – thwarted belongingness and perceived burdensomeness – actively desires for death. Nevertheless, our main aim was to find evidence for other psychological mechanisms, especially those relating to the (noxious) environment that surrounded a person in early life and evolutionary-shaped behavioural defensive responses included in our genetic repertoire, that may contribute to such willing for death (suicidal desire). So, we investigated the association between threat and submissiveness in childhood, self-judgement, entrapment and suicidal desire.

Gender differences show no significant differences regarding all study variables except for self-judgement, in which women scored higher than men. This finding goes in line with previous studies (*e.g.*, Baião, Gilbert, McEwan, & Carvalho, 2015). Concerning correlation analyses, all variables were significantly and positively associated with each other.

We hypothesized that early experiences of threat and submissiveness would affect desire for suicide indirectly through self-judgement and perceptions of entrapment. Consistent with our predictions, self-judgment and perceptions of entrapment in serial fully mediated the link between the recall of experiences of threat and submissiveness in childhood and desire for suicide. The reverse relationship, where the association between

such aversive early experiences and desire for suicide would be mediated by perceptions of entrapment and self-judgement in serial, was not supported.

More specifically, the direct effect, that is, the regression of the recall of threat and submissiveness in childhood on desire for suicide was not significant. This means that the recall of aversive experiences during childhood, such as those of threat and submissiveness, may not be related to suicidal desire alone, which is plausible since the majority of people that experience threat and are forced to submit during childhood may not experience active suicidal ideation, but rather, for example, depressed mood (Gilbert et al., 2001, 2003; Sturman & Mongrain, 2005; Taylor et al., 2011). Therefore, other psychological mechanisms may have specific roles that need to be considered. In this study, we analysed the roles of self-judgment and entrapment in the relationship between the recall of threat and submissiveness in childhood and suicidal desire (active suicidal ideation).

Analyses of the specific indirect effects show that the specific indirect effect of the recall of threat and submissiveness in childhood on desire for suicide through only self-judgement was non-significant as well. One explanation for such finding is that we did not use a specific measure accurately gauging self-criticism. Nevertheless, a self-to-self relationship based on negative judgements and evaluations that can be directed to multiple aspects of the self, also known as self-criticism (Longe et al., 2010), is related to several psychological disorders, such as, for example, depression (Beck, 1964; Joeng & Turner, 2015; Petrocchi, Dentale, & Gilbert, 2019), social anxiety (Cox et al., 2000) and self-harm (Castilho, Pinto-Gouveia, & Duarte, 2015b; Gilbert et al., 2010), being less related to suicidal ideation. However, O'Connor and Noyce (2008) have found a moderate link between self-criticism and suicidal ideation, even though this relationship was fully mediated by brooding, a peculiar kind of rumination. In this regard, our results are consistent with O'Connor and Noyce (2008), because we also yielded evidence that other mechanisms are required to be accounted for in the relation between self-criticism and active suicidal ideation (desire for suicide), such as entrapment, as suggested by our results. It is noteworthy that self-judgement, or more generally self-criticism, was more strongly correlated with the recall of threat and submissiveness in childhood. This finding is also in line with previous research (Castilho, Pinto-Gouveia, Amaral, & Duarte, 2014; Gilbert et al., 2003), that links such recall of aversive early experiences with depression, in which self-judgement is a key component, and, as one may plausibly state, depression

does not equal suicide. Furthermore, among self-critical depressed and voice-hearing psychotic patients, Gilbert and colleagues (2001) have outlined that those that have perceptions of being trapped in such internalized social ranking relationship, relating to thoughts/voices as hostile-dominant, are at greater risk of suicide-attempts.

On the contrary, the specific indirect effect through entrapment only was significant. This means that entrapment may be an important mechanism through which the recall of threat and submissiveness in childhood relates to suicidal desire. In fact, the perception that one has been defeated, has no escape and no possible rescue has long been associated with suicidal behaviour (Williams, 1997, 2001, 2014; Williams & Pollock, 2000; O'Connor & Portzky, 2018). Our results also show a moderate correlation between entrapment and suicidal desire, and large correlations between entrapment and aversive early experiences and self-judgement. These findings suggest that people that experience a noxious early environment marked by threat and submissiveness may be prone to internalize that interpersonal relationships are power relationships and, when in at a disadvantageous ranking, they may gain more easily the perception that they have been defeated, have no other escape and no one can rescue them. Hence, they may actively desire for suicide. Previous research has tested if entrapment interacted with perceived burdensomeness and thwarted belongingness (Forkmann & Teismann, 2017). Forkmann and Teismann (2017) have found that entrapment did not interact with neither perceived burdensomeness, nor thwarted belongingness, meaning that entrapment would not enhance neither of the interpersonal constructs in the prediction of suicidal ideation. Contrariwise to the study of Forkmaan and Teismann (2017), our results demonstrate that entrapment is an important psychological mechanism to consider, even within an interpersonal theory framework, especially among firefighters. As such, we suggest that the concept of interpersonal entrapment may be preferred to the concept of interpersonal hopelessness (Tucker et al., 2018), given that the thwarted interpersonal needs state that active suicidal ideators may find themselves in are aversive and, therefore, may induce one to escape such state. It may be the inability or failure in escaping such state, beyond perceiving them as stable and unchanging, that leads to actual desire for suicide. Further research is warranted, for example, among high-risk suicidal ideation (*e.g.*, clinical) samples, to clarify the role of interpersonal entrapment in suicidal desire. Moreover, a measure that specifically gauges interpersonal entrapment is required.

Nevertheless, some evidence was yielded concerning the specific indirect effect through both self-judgement and entrapment in serial, which was significant. This result suggests that both self-judgement and entrapment mediate the relation between experiences of threat and submissiveness in childhood and active suicidal ideation. It may be plausible to assume that it is the perception of the inability to escape or being rescued from a state based on a relationship one has with oneself centered on negative self-judgements and evaluations about the self globally, rather than a self-to-self relationship built upon criticism alone, through which a noxious early environment marked by threat and submissiveness may lead to active suicidal ideation. Further, when such escape or rescue is not possible, it represents some kind of defeat, being in a lower order ranking or put-down or perceiving that one doesn't have attractive, appealing or desiring characteristics to others, which ultimately may lead to desire for suicide.

The concept of entrapment may be preferred to the concept of hopelessness yet for another reason. As a concept, entrapment is divided into internal and external factors (Gilbert & Allan, 1998). Previously, we argued why external entrapment specific to states of thwarted belongingness and perceived burdensomeness (interpersonal entrapment) may be useful to predict active suicidal ideation. However, we argue that one peculiar kind of self-to-self relationship is being nourished within the suicidal ideator, one that is based on a predator-prey relationship, in which the suicidal ideator is both predator and prey, building upon previous theoretical considerations (Joiner & Stanley, 2016). In fact, one does not escape the relationship one has with him or herself. When such relationship is tainted by a similar scenario such as when one faces a predator, certain predator defences are activated (Joiner & Stanley, 2016). It is plausible to assume that it may be the inability to escape or being rescued from such predation scenario occurring within oneself that may also lead to active suicidal ideation. Hence, internal (or intrapersonal) entrapment may be of utter importance to be considered when predicting suicidal desire. Recently, Thomas Joiner and colleagues have proposed a newly designed clinical entity: the Acute Suicidal Affective Disturbance (ASAD; Stanley, Rufino, Rogers, Ellis, & Joiner, 2016; Tucker, Michaels, Rogers, Wingate, & Joiner, 2016), characterized by rapid onset suicidal intent and several related features. Even though it is a very recent proposed diagnostic entity, some evidence has already been gathered that ASAD symptoms are composed by a psychopathological network distinct from anxiety and depression (Rogers, Hom, & Joiner, 2019). Building upon Joiner and Stanley's (2016) premise that a suicidal

crisis may be understood as predator and prey mind-sets simultaneously activated, we argue that it is necessary that the prey cannot escape or be rescued from such imminent danger of predation, a scenario that is developing altogether within the suicidal individual. Therefore, with such predation scenario unfolding over the course of hours or days (versus weeks or months), we suggest that internal entrapment may be a powerful mechanism that should be considered, beyond perceptions of hopelessness, in this newly proposed clinical entity of ASAD and its diagnostic criteria.

There are, however, some major limitations to the current study that must be noted. First, even though the reverse model was non-significant, indicating some evidence regarding the tested model, conclusions on causality must be carefully handled given the cross-sectional design of the study. Second, self-report measures are subjected to several biases, such as social desirability, or even avoidance of some items or constructs measured. Third, the retrospective nature of the Early Life Experiences Scale may be especially prone to selective memory biases, which compromises the accuracy of the information. Fourth, our sample was highly heterogenous in terms of gender, being composed mainly by men. Fifth, the effects of trauma, an important correlate of suicide-related behaviours, were not controlled. Further studies are, therefore, recommended to prioritize longitudinal (in contrast to cross-sectional) designs, so that conclusions on causality can be more rigorously supported, to control for other important suicide-related behaviours correlates (such as trauma), to control for social desirability and to use more homogenous groups (regarding, for example, gender or career – professional *versus* volunteer-only firefighters).

Notwithstanding these limitations, we yield clear evidence of the important role of entrapment on active suicidal ideation, one that clinicians should be well aware of. So, we suggest that interpersonal entrapment may be central to the emergence of suicidal desire, beyond hopelessness as proposed by the interpersonal theory, and that internal entrapment may be a fundamental mechanism operating side-by-side the predator-prey relationship occurring within the suicidal ideator. Future studies may focus on further exploring this suicide rationale. Therefore, perceptions about the escape potential triggered by internal experiences should be considered in the newly proposed Acute Suicidal Affective Disturbance entity, as well as being outlined in its diagnostic criteria. Moreover, as a major psychological mechanism related to suicidal ideation and

behaviours, perceptions of entrapment should be targeted in psychotherapeutic interventions. One such cognitive-behavioural intervention that has been proposed to prevent individual's focusing on defeat and entrapment, by expanding their cognitive and behavioural repertoires (Griffiths, Wood, Maltby, Taylor, & Tai, 2014), is the Broad-Minded Affective Coping Procedure (BMAC; Johnson, Gooding, Wood, Fair, & Tarrier, 2013; Tarrier, 2010). Nonetheless, there is yet to be gathered evidence of the efficacy of this recently proposed intervention tool in specifically diminishing perceptions of entrapment. Also, Mindfulness-Based Cognitive Therapy (MBCT; Williams, Fennell, Barnhofer, Crane, & Silverton, 2015) has demonstrated important results in diminishing suicidal cognitions.

## References

- Baião, R., Gilbert, P., McEwan, K., & Carvalho, S. (2015). Forms of Self-Criticising/Attacking & Self-Reassuring Scale: Psychometric properties and normative study. *Psychology and Psychotherapy: Theory, Research and Practice*, 88(4), 438–452. <https://doi.org/10.1111/papt.12049>
- Beck, A. T. (1964). Thinking and depression: II. Theory and therapy. *Archives of General Psychiatry*, 10, 561–571. <http://dx.doi.org/10.1001/archpsyc.1964.01720240015003>
- Boffa, J. W., Stanley, I. H., Hom, M. A., Norr, A. M., Joiner, T. E., & Schmidt, N. B. (2017). PTSD symptoms and suicidal thoughts and behaviors among firefighters. *Journal of Psychiatric Research*, 84, 277–283. <https://doi.org/10.1016/j.jpsychires.2016.10.014>
- Campos, R. C., & Holden, R. R. (2016). Testing a Theory-Based Model of Suicidality in a Community Sample. *Omega - Journal of Death and Dying*, 74(2), 119–137. <https://doi.org/10.1177/0030222815598428>
- Carvalho, S., Gouveia, J. P., Castilho, P., & Pimentel, P. (2011). Entrapment: concept, definition and psychometric characteristics of Portuguese version for the Entrapment Scale. *Psychologica*, (54), 385–411. [https://doi.org/10.14195/1647-8606\\_54\\_15](https://doi.org/10.14195/1647-8606_54_15)
- Castilho, P., Pinto-Gouveia, J., Amaral, V., & Duarte, J. (2014). Recall of Threat and Submissiveness in Childhood and Psychopathology: The Mediator Effect of Self-Criticism. *Clinical Psychology and Psychotherapy*, 21(1), 73–81. <https://doi.org/10.1002/cpp.1821>
- Castilho, P., Pinto-Gouveia, J., & Duarte, J. (2015a). Evaluating the Multifactor Structure of the Long and Short Versions of the Self-Compassion Scale in a Clinical Sample. *Journal of Clinical Psychology*, 1-15. DOI:10.1002/jclp.22187
- Castilho, P., Pinto-Gouveia, J., & Duarte, J. (2015b). Exploring Self-criticism: Confirmatory Factor Analysis of the FSCRS in Clinical and Nonclinical Samples. *Clinical Psychology and Psychotherapy*, 22(2), 153–164. <https://doi.org/10.1002/cpp.1881>



- Chu, C., Buchman-Schmitt, J. M., Hom, M. A., Stanley, I. H., & Joiner, T. E. (2016). A test of the interpersonal theory of suicide in a large sample of current firefighters. *Psychiatry Research, 240*, 26–33. <https://doi.org/10.1016/j.psychres.2016.03.041>
- Chu, C., Hom, M. A., Rogers, M. L., Stanley, I. H., Ringer-Moberg, F. B., Podlogar, M. C., ... Joiner, T. E. (2017). Insomnia and suicide-related behaviors: A multi-study investigation of thwarted belongingness as a distinct explanatory factor. *Journal of Affective Disorders, 208*(August 2016), 153–162. <https://doi.org/10.1016/j.jad.2016.08.065>
- Cohen, J. W. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum Associates.
- Cowlishaw, S., Evans, L., & McLennan, J. (2010). Work-family conflict and crossover in volunteer emergency service workers. *Work and Stress, 24*(4), 342–358. <https://doi.org/10.1080/02678373.2010.532947>
- Cox, B. J., Rector, N. A., Bagby, R. M., Swinson, R. P., Levitt, A. J., & Joffe, R. T. (2000). Is self-criticism unique for depression? A comparison with social phobia. *Journal of Affective Disorders, 57*(1–3), 223–228. [https://doi.org/10.1016/S0165-0327\(99\)00043-9](https://doi.org/10.1016/S0165-0327(99)00043-9)
- Dixon, A. K. (1998). Ethological strategies for defence in animals and humans: Their role in some psychiatric disorders. *British Journal of Medical Psychology, 71*(4), 417–445. <https://doi.org/10.1111/j.2044-8341.1998.tb01001.x>
- Dixon, A. K., Fisch, H. U., Huber, C., & Walser, A. (1989). Ethological Studies in Animals and Man, Their Use in Psychiatry. *Pharmacopsychiatry, 22*(S 1), 44–50. <https://doi.org/10.1055/s-2007-1014624>
- Forkmann, T., & Teismann, T. (2017). Entrapment, perceived burdensomeness and thwarted belongingness as predictors of suicide ideation. *Psychiatry Research, 257*(July), 84–86. <https://doi.org/10.1016/j.psychres.2017.07.031>
- Gallyer, A. J., Dougherty, S. P., Gai, A. R., Stanley, I. H., Hom, M. A., Rogers, M. L., ... Joiner, T. E. (2018). Problematic alcohol use and suicidal ideation among firefighters: A multi-study investigation of the explanatory roles of perceived burdensomeness and thwarted belongingness. *Journal of Affective Disorders, 238*(December 2017), 281–288. <https://doi.org/10.1016/j.jad.2018.05.045>

*The impact of aversive childhood experiences, self-criticism and entrapment on desire for suicide*

- Gilbert, P. (2000). Varieties of submissive behavior as forms of social defense: Their evolution and role in depression. In L. Sloman & P. Gilbert (Eds.), *Subordination and defeat: An evolutionary approach to mood disorders and their therapy* (pp. 3–45). Mahwah, NJ: Erlbaum.
- Gilbert, P. (2014). The origins and nature of compassion focused therapy. *British Journal of Clinical Psychology*, *53*(1), 6–41. <https://doi.org/10.1111/bjc.12043>
- Gilbert, P., & Allan, S. (1998). The role of defeat and entrapment (arrested flight) in depression: An exploration of an evolutionary view. *Psychological Medicine*, *28*(3), 585–598. <https://doi.org/10.1017/S0033291798006710>
- Gilbert, P., Birchwood, M., Gilbert, J., Trower, P., Hay, J., Murray, B., ... Miles, J. N. V. (2001). An exploration of evolved mental mechanisms for dominant and subordinate behaviour in relation to auditory hallucinations in schizophrenia and critical thoughts in depression. *Psychological Medicine*, *31*(2), 1117–1127. <https://doi.org/10.1017/S003329170105409z>
- Gilbert, P., Cheung, M. S.-P., Grandfield, T., Campey, F., & Irons, C. (2003). Recall of threat and submissiveness in childhood: Development of a new scale and its relationship with depression, social comparison and shame. *Clinical Psychology and Psychotherapy*, *10*(2), 108–115. <https://doi.org/10.1002/cpp.359>
- Gilbert, P., McEwan, K., Irons, C., Bhundia, R., Christie, R., Broomhead, C., & Rockliff, H. (2010). Self-harm in a mixed clinical population: The roles of self-criticism, shame, and social rank. *British Journal of Clinical Psychology*, *49*(4), 563–576. <https://doi.org/10.1348/014466509X479771>
- Griffiths, A. W., Wood, A. M., Maltby, J., Taylor, P. J., & Tai, S. (2014). The prospective role of defeat and entrapment in depression and anxiety: A 12-month longitudinal study. *Psychiatry Research*, *216*(1), 52–59. <https://doi.org/10.1016/j.psychres.2014.01.037>
- Haugen, P. T., McCrillis, A. M., Smid, G. E., & Nijdam, M. J. (2017). Mental health stigma and barriers to mental health care for first responders: A systematic review and meta-analysis. *Journal of Psychiatric Research*, *94*, 218–229. <https://doi.org/10.1016/j.jpsychires.2017.08.001>

- Hayes, A. F. (2013). *Introduction to Mediation, Moderation, and Conditional Process Analysis: A Regression-based Approach*. New York: The Guilford Press.
- Joeng, J. R., & Turner, S. L. (2015). Mediators between self-criticism and depression: Fear of compassion, self-compassion, and importance to others. *Journal of Counseling Psychology*, *62*(3), 453–463. <https://doi.org/10.1037/cou0000071>
- Johnson, J., Gooding, P. A., Wood, A. M., Fair, K. L., & Tarrier, N. (2013). A therapeutic tool for boosting mood: The broad-minded affective coping procedure (BMAC). *Cognitive Therapy and Research*, *37*(1), 61–70. <https://doi.org/10.1007/s10608-012-9453-8>
- Joiner, T. E. (2005). *Why people die by suicide* (1st ed.). Cambridge, Massachusetts: Harvard University Press. Retrieved from <http://ir.obihiro.ac.jp/dspace/handle/10322/3933>
- Joiner, T. E., & Stanley, I. H. (2016). Can the Phenomenology of a Suicidal Crisis Be Usefully Understood As a Suite of Antipredator Defensive Reactions? *Psychiatry (New York)*, *79*(2), 107–119. <https://doi.org/10.1080/00332747.2016.1142800>
- Kaufmann, J. H. (1983). On the definition and function of dominance and territoriality. *Biological Reviews*, *58*, 1-20.
- Longe, O., Maratos, F. A., Gilbert, P., Evans, G., Volker, F., Rockliff, H., & Rippon, G. (2010). Having a word with yourself: Neural correlates of self-criticism and self-reassurance. *NeuroImage*, *49*(2), 1849–1856. <https://doi.org/10.1016/j.neuroimage.2009.09.019>
- Lopes, B., & Pinto-Gouveia, J. (2012). *Portuguese version of the The Early Life Experiences Scale*. Unpublished manuscript
- Lorenz, K. (1981). *The Foundations of Ethology*. New York: Springer-Verlag
- Martin, C. E., Vujanovic, A. A., Paulus, D. J., Bartlett, B., Gallagher, M. W., & Tran, J. K. (2017). Alcohol use and suicidality in firefighters: Associations with depressive symptoms and posttraumatic stress. *Comprehensive Psychiatry*, *74*, 44–52. <https://doi.org/10.1016/j.comppsy.2017.01.002>
- Melo, R., & Castilho, P. (2019). *Thwarted Interpersonal Needs: Confirmatory Factor Analysis and Psychometric Properties of the Portuguese Version of the Interpersonal Needs Questionnaire*. Manuscript in preparation

*The impact of aversive childhood experiences, self-criticism and entrapment on desire for suicide*

- Mikulincer, M., & Shaver, P. R. (2004). Security-based self-representations in adulthood: Contents and processes. In W. S. Rholes & J. A. Simpson (Eds.), *Adult attachment: Theory, research, and clinical implications* (pp. 159–195). New York: Guilford Press
- Mikulincer, M., & Shaver, P. R. (2016). *Attachment in Adulthood: Structure, Dynamics, and Change* (2<sup>nd</sup> Ed.). New York: The Guilford Press
- Minelli, A. (2008). Predation. In S. E. Jørgensen & B. D. Fath (Eds.), *Encyclopedia of Ecology* (1st ed., pp. 2923–2929). Elsevier B.V.
- Neff, K. (2003). The Development and Validation of a Scale to Measure Self-Compassion. *Self and Identity*, 2, 223–250. <https://doi.org/10.1080/15298860390209035>
- O'Connor, R. C. (2007). The Relations between Perfectionism and Suicidality: A Systematic Review. *Suicide and Life-Threatening Behavior*, 37(6), 698–714. <https://doi.org/10.1521/suli.2007.37.6.698>
- O'Connor, R. C., & Kirtley, O. J. (2018). The Integrated Motivational-Volitional Model of Suicidal Behaviour. *Philosophical Transactions of the Royal Society of London. Series B, Biological Sciences*, 373. <https://doi.org/10.1098/rstb.2017.0268>
- O'Connor, R. C., & Noyce, R. (2008). Personality and cognitive processes: Self-criticism and different types of rumination as predictors of suicidal ideation. *Behaviour Research and Therapy*, 46(3), 392–401. <https://doi.org/10.1016/j.brat.2008.01.007>
- O'Connor, R. C., & Portzky, G. (2018). The relationship between entrapment and suicidal behavior through the lens of the integrated motivational–volitional model of suicidal behavior. *Current Opinion in Psychology*, 22, 12–17. <https://doi.org/10.1016/j.copsyc.2017.07.021>
- Pallant, J. (2016). *SPSS Survival Manual: A Step By Step Guide to Data Analysis Using SPSS Program* (6th ed.). London, UK: McGraw-Hill Education
- Petrocchi, N., Dentale, F., & Gilbert, P. (2019). Self-reassurance, not self-esteem, serves as a buffer between self-criticism and depressive symptoms. *Psychology and Psychotherapy: Theory, Research and Practice*, 394–406. <https://doi.org/10.1111/papt.12186>

- Price, J. S. (1972). Genetic and phylogenetic aspects of mood variation. *Int. J. Mental Health*, 1, 124–144
- Price, J. S., & Sloman, L. (1987). Depression as yielding behavior: An animal model based on Schjelderup-Ebbe's pecking order. *Ethology and Sociobiology*, 8(SUPPL. 1), 85–98. [https://doi.org/10.1016/0162-3095\(87\)90021-5](https://doi.org/10.1016/0162-3095(87)90021-5)
- Price, J. S., Sloman, L., Gardner, R., Gilbert, P., & Rohde, P. (1994). The Social Competition Hypothesis of Depression. *British Journal of Psychiatry*, 164(03), 309–315. <https://doi.org/10.1192/bjp.164.3.309>
- Rogers, M. L., Hom, M. A., & Joiner, T. E. (2019). Differentiating acute suicidal affective disturbance (ASAD) from anxiety and depression Symptoms: A network analysis. *Journal of Affective Disorders*, 250(October 2018), 333–340. <https://doi.org/10.1016/j.jad.2019.03.005>
- Schjelderup-Ebbe, T. (1935). Social behaviour of birds. In C. Murchison (Ed.), *Handbook of Social Psychology* (pp. 947-972). Worcester, MA: Clark University Press
- Sloman, L. (2000). How the involuntary defeat strategy relates to depression. In L. Sloman & P. Gilbert (Eds.), *Subordination and defeat: An evolutionary approach to mood disorders and their therapy* (pp. 47–67). Mahwah, NJ: Erlbaum
- Sloman, L., & Gilbert, P. (2000). Introduction. In L. Sloman & P. Gilbert (Eds.), *Subordination and defeat: An evolutionary approach to mood disorders and their therapy* (pp. ix–xiii). Mahwah, NJ: Erlbaum
- Sober, E. (2005). *Core Questions in Philosophy: A Text with Readings* (4<sup>th</sup> Ed.). New Jersey: Pearson Prentice Hall
- Stanley, I. H., Boffa, J. W., Hom, M. A., Kimbrel, N. A., & Joiner, T. E. (2017). Differences in psychiatric symptoms and barriers to mental health care between volunteer and career firefighters. *Psychiatry Research*, 247(12), 236–242. <https://doi.org/10.1016/j.psychres.2016.11.037>
- Stanley, I. H., Hom, M. A., Hagan, C. R., & Joiner, T. E. (2015). Career prevalence and correlates of suicidal thoughts and behaviors among firefighters. *Journal of Affective Disorders*, 187, 163–171. <https://doi.org/10.1016/j.jad.2015.08.007>
- Stanley, I. H., Hom, M. A., & Joiner, T. E. (2016). A systematic review of suicidal thoughts and behaviors among police officers, firefighters, EMTs, and paramedics.

*The impact of aversive childhood experiences, self-criticism and entrapment on desire for suicide*

*Clinical Psychology Review*, 44, 25–44. <https://doi.org/10.1016/j.cpr.2015.12.002>

- Stanley, I. H., Rufino, K. A., Rogers, M. L., Ellis, T. E., & Joiner, T. E. (2016). Acute Suicidal Affective Disturbance (ASAD): A confirmatory factor analysis with 1442 psychiatric inpatients. *Journal of Psychiatric Research*, 80, 97–104. <https://doi.org/10.1016/j.jpsychires.2016.06.012>
- Sturman, E. D., & Mongrain, M. (2005). Self-criticism and major depression: An evolutionary perspective. *British Journal of Clinical Psychology*, 44(4), 505–519. <https://doi.org/10.1348/014466505X35722>
- Tarrier, N. (2010). Broad Minded Affective Coping (BMAC): A “Positive” CBT Approach to Facilitating Positive Emotions. *International Journal of Cognitive Therapy*, 3(1), 64–76.
- Taylor, P. J., Gooding, P., Wood, A. M., & Tarrier, N. (2011). The Role of Defeat and Entrapment in Depression, Anxiety, and Suicide. *Psychological Bulletin*, 137(3), 391–420. <https://doi.org/10.1037/a0022935>
- Tucker, R. P., Hagan, C. R., Hill, R. M., Shish, M. L., Bagge, C. L., Joiner, T. E., & Wingate, L. R. R. (2018). Empirical extension of the interpersonal theory of suicide: Investigating the role of interpersonal hopelessness. *Psychiatry Research*, 259(June 2017), 427–432. <https://doi.org/10.1016/j.psychres.2017.11.005>
- Tucker, R. P., Michaels, M. S., Rogers, M. L., Wingate, L. R. R., & Joiner, T. E. (2016). Construct validity of a proposed new diagnostic entity: Acute Suicidal Affective Disturbance (ASAD). *Journal of Affective Disorders*, 189, 365–378. <https://doi.org/10.1016/j.jad.2015.07.049>
- Van Orden, K. A., Cukrowicz, K. C., Witte, T. K., & Joiner, T. E. (2012). Thwarted belongingness and perceived burdensomeness: Construct validity and psychometric properties of the Interpersonal Needs Questionnaire. *Psychological Assessment*, 24(1), 197–215. <https://doi.org/10.1037/a0025358>
- Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E. (2010). The Interpersonal Theory of Suicide. *Psychological Review*, 117(2), 575–600. <https://doi.org/10.1037/a0018697>

- Van Orden, K. A., Witte, T. K., Gordon, K. H., Bender, T. W., & Joiner, T. E. (2008). Suicidal Desire and the Capability for Suicide: Tests of the Interpersonal-Psychological Theory of Suicidal Behavior Among Adults. *Journal of Consulting and Clinical Psychology, 76*(1), 72–83. <https://doi.org/10.1037/0022-006X.76.1.72>
- Wetherall, K., Robb, K. A., & O'Connor, R. C. (2019). Social rank theory of depression: A systematic review of self-perceptions of social rank and their relationship with depressive symptoms and suicide risk. *Journal of Affective Disorders, 246*, 300–319. <https://doi.org/10.1016/j.jad.2018.12.045>
- Williams, J. M. G. (1997). *Cry of Pain: Understanding suicide and self-harm*. London: Penguin
- Williams, J. M. G. (2001). *The Cry of Pain*. London: Penguin
- Williams, J. M. G. (2014). *Cry of pain: Understanding suicide and the suicidal mind* (3<sup>rd</sup> Ed.). London: Piatkus
- Williams, J. M. G., Fennell, M., Barnhofer, T., Crane, R., & Silverton, S. (2015). *Mindfulness and the Transformation of Despair: Working with People at Risk of Suicide*. New York: The Guilford Press.
- Williams, J. M. G., & Pollock, L. R. (2000). The Psychology of Suicidal Behaviour. In K. Hawton & K. van Heeringen (Eds.), *The International Handbook of Suicide and Attempted Suicide* (pp. 79-94). West Sussex: John Wiley & Sons
- Williams, J. M. G., & Pollock, L. R. (2002). Psychological aspects of the suicidal process. In K. van Heeringen (Ed.), *Understanding suicidal behaviour*. Chichester: Wiley.

## **Preface References**

- Ângelo, R. P., & Chambel, M. J. (2015). The reciprocal relationship between work characteristics and employee burnout and engagement: a longitudinal study of firefighters. *Stress and Health, 31*(2), 106–114. <https://doi.org/10.1002/smi.2532>
- Carey, M. G., Al-Zaiti, S. S., Dean, G. E., Sessanna, L., & Finnell, D. S. (2011). Sleep problems, depression, substance use, social bonding, and quality of life in professional firefighters. *Journal of Occupational and Environmental Medicine, 53*(8), 928–933. <https://doi.org/10.1097/JOM.0b013e318225898f>
- Carvalho, C., & Maia, A. (2009). Perturbação Pós – Stress Traumático E Indicadores De (in)Adaptação Em Bombeiros Portugueses. In A. Maia, S. Silva, & T. Pires (Eds.), *Desafios da saúde e comportamento: actores, contextos e problemáticas. Actas do 1º Congresso de Saúde e Comportamento dos Países de Língua Portuguesa* (pp. 277–290). Braga: CIPSI edições.
- Chu, C., Buchman-Schmitt, J. M., Hom, M. A., Stanley, I. H., & Joiner, T. E. (2016). A test of the interpersonal theory of suicide in a large sample of current firefighters. *Psychiatry Research, 240*, 26–33. <https://doi.org/10.1016/j.psychres.2016.03.041>
- Chu, C., Buchman-Schmitt, J. M., Stanley, I. H., Hom, M. A., Tucker, R. P., Hagan, C. R., ... Joiner, T. E. (2017). The interpersonal theory of suicide: A systematic review and meta-analysis of a decade of cross-national research. *Psychological Bulletin, 143*(12), 1313–1345. <https://doi.org/10.1037/bul0000123>
- Heinrichs, M., Wagner, D., Schoch, W., Soravia, L. M., Hellhammer, D. H., & Ehlert, U. (2005). Predicting Posttraumatic Stress Symptoms From Pretraumatic Risk Factors: A 2-Year Prospective Follow-Up Study in Firefighters. *American Journal of Psychiatry, 162*(12), 2276–2286. <https://doi.org/10.1176/appi.ajp.162.12.2276>
- Hom, M. A., Stanley, I. H., Ringer, F. B., & Joiner, T. E. (2016). Mental Health Service Use Among Firefighters With Suicidal Thoughts and Behaviors. *Psychiatric Services. https://doi.org/10.1176/appi.ps.201500177*
- Hom, M. A., Stanley, I. H., Rogers, M. L., Tzoneva, M., Bernert, R. A., & Joiner, T. E. (2016). The association between sleep disturbances and depression among firefighters: emotion dysregulation as an explanatory factor. *Journal of Clinical*



*Sleep Medicine*, 12(2), 235–245. <https://doi.org/10.5664/jcsm.5492>

Joiner, T. E. (2005). *Why people die by suicide* (1st ed.). Cambridge, Massachusetts: Harvard University Press.

Joiner, T. E., Ribeiro, J. D., & Silva, C. (2012). Nonsuicidal Self-Injury, Suicidal Behavior, and Their Co-occurrence as Viewed Through the Lens of the Interpersonal Theory of Suicide. *Current Directions in Psychological Science*, 21(5), 342–347. <https://doi.org/10.1177/0963721412454873>

Klonsky, E. D., Saffer, B. Y., & Bryan, C. J. (2018). Ideation-to-action theories of suicide: a conceptual and empirical update. *Current Opinion in Psychology*, 22, 38–43. <https://doi.org/10.1016/j.copsyc.2017.07.020>

Ma, J., Batterham, P. J., Calear, A. L., & Han, J. (2016). A systematic review of the predictions of the Interpersonal-Psychological Theory of Suicidal Behavior. *Clinical Psychology Review*, 46, 34–45. <https://doi.org/10.1016/j.cpr.2016.04.008>

Miguel, L. V. A., & Queirós, C. (2013). *Burnout, stress e satisfação com o trabalho em bombeiros*. Universidade do Porto.

Moreira, I. E. S., & Queirós, C. (2012). *Sensation seeking, coping e engagement em bombeiros*. Universidade do Porto.

Nock, M. K., Borges, G., Bromet, E. J., Alonso, J., Angermeyer, M., Beautrais, A., ... Williams, D. (2008). Cross-national prevalence and risk factors for suicidal ideation, plans and attempts. *British Journal of Psychiatry*, 192(2), 98–105. <https://doi.org/10.1192/bjp.bp.107.040113>

Nock, M. K., Millner, A. J., Joiner, T. E., Gutierrez, P. M., Han, G., Hwang, I., ... Gelernter, J. (2018). Risk factors for the transition from suicide ideation to suicide attempt: Results from the army study to assess risk and resilience in Servicemembers (Army STARRS). *Journal of Abnormal Psychology*, 127(2), 139–149. <https://doi.org/10.1037/abn0000317>

O'Connor, R. C., & Pirkis, J. (2016). Introduction. In R. C. O'Connor & J. Pirkis (Eds.), *The International Handbook of Suicide Prevention* (2<sup>nd</sup> Ed., pp. 1-7). West Sussex: John Wiley & Sons, Ltd.

Pinto, R. J., Henriques, S. P., Jongenelen, I., Carvalho, C., & Maia, Â. C. (2015). The Strongest Correlates of PTSD for Firefighters: Number, Recency, Frequency, or

- Perceived Threat of Traumatic Events?. *Journal of Traumatic Stress*, 28, 434–440.  
<https://doi.org/10.1002/jts.22035>
- Pollock, L. R., & Williams, J. M. G. (1998). Problem Solving and Suicidal Behavior. *Suicide and Life-Threatening Behavior*, 28(4), 375–387.
- Ribeiro, J. D., Franklin, J. C., Fox, K. R., Bentley, K. H., Kleiman, E. M., Chang, B. P., & Nock, M. K. (2016). Self-injurious thoughts and behaviors as risk factors for future suicide ideation, attempts, and death: a meta-analysis of longitudinal studies. *Psychological Medicine*, 46(02), 225–236.  
<https://doi.org/10.1017/s0033291715001804>
- Silverman, M. M., Berman, A. L., Sanddal, N. D., O’Carroll, P. W., & Joiner, T. E. (2007). Rebuilding the Tower of Babel: A Revised Nomenclature for the Study of Suicide and Suicidal Behaviors Part 2: Suicide-related ideations, communications, and behaviors. *Suicide & Life-Threatening Behavior*, 37(3), 264–277.  
<https://doi.org/10.1521/suli.2007.37.3.264>
- Sociedade Portuguesa de Suicidologia. (2019). *Sobre o suicídio: estatística*. Retrieved September 4, 2019, from <https://spsuicidologia.com/sobre-o-suicidio/estatistica>.
- Stanley, I. H., Boffa, J. W., Hom, M. A., Kimbrel, N. A., & Joiner, T. E. (2017). Differences in psychiatric symptoms and barriers to mental health care between volunteer and career firefighters. *Psychiatry Research*, 247(12), 236–242.  
<https://doi.org/10.1016/j.psychres.2016.11.037>
- Stanley, I. H., Hom, M. A., Hagan, C. R., & Joiner, T. E. (2015). Career prevalence and correlates of suicidal thoughts and behaviors among firefighters. *Journal of Affective Disorders*, 187, 163–171. <https://doi.org/10.1016/j.jad.2015.08.007>
- Stanley, I. H., Hom, M. A., & Joiner, T. E. (2016). A systematic review of suicidal thoughts and behaviors among police officers, firefighters, EMTs, and paramedics. *Clinical Psychology Review*, 44, 25–44. <https://doi.org/10.1016/j.cpr.2015.12.002>
- Van Orden, K. A., Cukrowicz, K. C., Witte, T. K., & Joiner, T. E. (2012). Thwarted belongingness and perceived burdensomeness: Construct validity and psychometric properties of the Interpersonal Needs Questionnaire. *Psychological Assessment*, 24(1), 197–215. <https://doi.org/10.1037/a0025358>

- Van Orden, K. A., Witte, T. K., Cukrowicz, K. C., Braithwaite, S. R., Selby, E. A., & Joiner, T. E. (2010). The Interpersonal Theory of Suicide. *Psychological Review*, *117*(2), 575–600. <https://doi.org/10.1037/a0018697>
- Van Orden, K. A., Witte, T. K., Gordon, K. H., Bender, T. W., & Joiner, T. E. (2008). Suicidal Desire and the Capability for Suicide: Tests of the Interpersonal-Psychological Theory of Suicidal Behavior Among Adults. *Journal of Consulting and Clinical Psychology*, *76*(1), 72–83. <https://doi.org/10.1037/0022-006X.76.1.72>
- Vara, N. C., & Queirós, C. (2007). *Burnout e satisfação no trabalho em bombeiros que trabalham na área da emergência pré-hospitalar*. Universidade do Porto.
- Williams, J. M. G. (2014). *Cry of pain: Understanding suicide and the suicidal mind* (3<sup>rd</sup> Ed.). London: Piatkus.
- World Health Organization. (2019). *Suicide*. Retrieved September 4, 2019, from <https://www.who.int/news-room/fact-sheets/detail/suicide>.