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Beatriz Gonçalves de Almeida

Vulnerable or Protected:

The Impact of Early Emotional Memories on Social Anxiety and Post-traumatic Growth

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Beatriz Gonçalves de Almeida

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Vulnerable or protected: the impact of early emotional memories on social anxiety and post-traumatic growth

Beatriz Gonçalves de Almeida [1]

Maria do Céu Salvador [1]

Marcela Matos [1]

[1] Universidade de Coimbra, Portugal

A correspondência relativa a este artigo deverá ser enviada a:
Beatriz Gonçalves de Almeida
Faculdade de Psicologia e Ciências da Educação,
Universidade de Coimbra
Rua do Colégio Novo, Apartado 6153
3001-802 Coimbra, Portugal
Email: beatriz.gon.almeida@gmail.com

Abstract

Some studies have already examined the relationship between the traumatic impact and centrality of shame memories and SA and the relationship between posttraumatic growth and psychopathology. Furthermore, there is research exploring the impact of EMWS with parents and peers on SA and the relationship between SA and resilience. Since, to the best of our knowledge no prior studies related early emotional memories, posttraumatic growth, and SA, the general aim of this study was to explore the association between the traumatic impact and centrality of shame memories, EMWS with parents and peers, posttraumatic growth and SA, and particularly, to explore if the traumatic characteristics of shame memories and the centrality of these experiences would have the same impact on SA and on posttraumatic growth, since, through the literature review, both posttraumatic growth and psychopathology could result from trauma-like experiences. The cross-sectional study included two populations (student and adult samples) but, since there were significant differences we decided to introduce population as a control variable in the subsequent models and thus, only the total sample was used (N = 515: M$_{age}$ = 27.36; SD = 11.69). Partial correlations revealed positive, negative, moderate and significant correlations between the variables in study. Two moderated mediation models were estimated using PROCESS revealing positive and significant direct and indirect effects, through the centrality of shame memories, of memories with traumatic impact and posttraumatic growth or SA. In conclusion, there is a direct and indirect association between traumatic impact of early shame experiences and SA and posttraumatic growth.

Key-words: the traumatic impact of early shame experiences; centrality of shame memories; posttraumatic growth; social anxiety**;** early memories of warmth and safeness

Resumo

Alguns estudos já examinaram a relações entre o impacto traumático e a centralidade das memórias de vergonha e AS e entre o crescimento pós-traumático e a psicopatologia. Além disso, há investigações que exploram o impacto das EMWS com pais e pares na AS e a relação entre a AS e a resiliência. Uma vez que, nenhum estudo relacionou memórias emocionais precoces, crescimento pós-traumático e AS, o objectivo geral deste estudo foi explorar a associação entre o impacto traumático e a centralidade das memórias de vergonha, EMWS com pais e pares, crescimento pós-traumático e AS, e particularmente, para investigar se as características traumáticas das memórias de vergonha e a centralidade dessas experiencias teria o mesmo impacto na AS e no crescimento pós-traumático, dado que, em linha com a revisão da literatura, ambos o crescimento pós-traumático e a psicopatologia podem resultas de experiências traumáticas. O estudo transversal incluiu duas populações (estudantes e adultos) mas, uma vez que se verificaram diferenças significativas entre elas decidimos introduzir a população como variável de controlo e utilizar a amostra total (N = 515: Midade = 27.36; SD = 11.69). Correlações parciais revelaram associações positivas, negativas, moderadas e significativas entre as variáveis em estudo. Dois modelos de mediação simples estimados com o PROCESS revelaram efeitos positivos e significativos, diretos e indirectos, através da centralidade das memórias de vergonha, memórias com impacto traumático e crescimento pós-traumático ou AS. Em conclusão, há uma associação direta e indirecta entre o impacto traumático de experiencias precoces de vergonha, a ansiedade social e o crescimento pós-traumático.

Palavras-chave: impacto traumático de memórias precoces de vergonha; centralidade de experiências de vergonha; crescimento pós-traumático; ansiedade social; memórias precoces de calor e afeto

Introduction

Evolutionary theory and social anxiety

Human evolution developed the ability in our minds to understand other people and what might be going on in their minds – theory of mind (Byrne, 1995) – and that gave us the sense that one needs to exist positively in the other's mind, to connect and form stable caring relationships (Cacioppo & Patrick, 2008), which will ensure our survival as a species (Cacioppo, Berston, Sheridan & McClintock, 2000). Therefore, humans are threatened by the idea of failing to obtain other people's interest and their consequent rejection (Gilbert, 2014). In the context of this theory, Gilbert (2010) proposed the existence of three emotional regulation systems: the threat system, that detects and rapidly responds to threats in order to protect the self from danger, being related to anger, shame, anxiety and defensive behaviors (Gilbert, 2009); the drive system, that guides and motivates us to seek out resources that are important for survival and prosperity, being related to positive affect emotions like excitement, pride and pleasure (Depue & Morrone-Strupinsky, 2005); and the soothing system, that is only activated when individuals are neither focused on threats nor competing for resources, helping us to restore our balance, being related to peacefulness, safeness, lower arousal forms of positive affect, (e.g. calmness, reassurance), and affiliative behaviour (Depue & Morrone-Strupinsky, 2005).

Within these three systems, Gilbert (2005, 2009, 2010) also suggests that humans have several "social mentalities", which are the organization of various psychological competencies and modules (e.g., for attention, ways of thinking, and action tendencies) guided by motives to secure and form specific types of social relationships, by interpreting social cues and identifying the best behavior to adopt (Gilbert, 2005, 2009, 2014): caregiving; care seeking/receiving (Gilbert, 2010); cooperative (Gilbert, 2005); competitive/social ranking; and sexual behavior. Therefore, in order to avoid a low-rank position (i.e. inferiority) and its consequences (Gilbert, 1998, 2007, 2014), competitive mentalities and the drive system are activated, and one is focused in winning other's approval and acceptance (Gilbert, 2001).

Social anxiety (SA) appears due to people being highly focused on trying to obtain other's approval but feeling that they will fail on doing so (Schlenker & Leary, 1982), having a perception of social threat (Gilbert, 2014), and fearing a bad performance (Gilbert, 2001; Schlenker & Leary, 1982). Consequently, SA can work as an adaptive coping strategy, helping people to pay attention to what may not be socially acceptable and that may result in social damage (Gilbert, 2001; Gilbert & McGuire, 1998). These mechanisms become maladaptive when SA becomes more severe or is frequently experienced (Hope, Heimberg, Juster, & Turk, 2000), causing suffering and marked interference in one's life; in this situation, we may then be talking about social anxiety disorder (SAD). SAD is characterized by intensified fear or anxiety in social situations in which the individual may be subject to the scrutiny of others (American Psychiatric Association, 2013), being the most

common anxiety disorder (Kessler et al., 1994), affecting 13.30% of the Portuguese population (Pinto-Gouveia, Cunha, & Salvador, 1997).These individuals tend to view social cues and social relationships as a threat and, in a social situation, their competitive mentality is more concerned with social rank, focused in avoiding rejection and involved in submissive and avoidant behaviors, and less focused on behaving in an affiliative way, using approach behaviors within a cooperative mentality (Gilbert, 2001; Schlenker & Leary, 1982; Weisman, Aderka, Marom, Hermesh & Gilboa-Schechtman, 2011).

Shame experiences, the impact and centrality of shame memories and social anxiety

The fear of being seen as inferior compared with others, and this focus on the self as (un)attractive, and devalued in the eyes of others, with fear of being negatively judged by them, is what links SA to shame (Clark & Wells, 1995; Gilbert, 2001; Gilbert & McGuire, 1998; Pinto-Gouveia, 1999; Matos, Pinto-Gouveia & Gilbert, 2013).

From an early age, we can experience shame in our interactions with significant others. Examples include being criticized by a parent, bullied by peers or failing at something important. Shame is linked to the experience of threat or loss of abilities to create desirable images of the self in the mind of others so that others may reject, exclude or harm the self (Gilbert, 1998, 2007; Matos, Duarte & Pinto-Gouveia, 2017b), thus representing a threat to the social self and self-identity. Several studies on shame have stressed the key role this emotion plays in human functioning and its powerful impact in a wide range of psychological symptoms, such as anxiety (Irons, & Gilbert, 2005; Matos & Pinto-Gouveia, 2009; Matos et al, 2015; Tangney et al., 1992) and SA (Gilbert, 2000; Grabhorn, Stenner, Stangier, & Kaufhold, 2006; Matos, Pinto-Gouveia & Gilbert, 2013).

Several studies have shown that shame proneness is an innate capacity (Gilbert & McGuire, 1998) and seems to have trauma-like origins in early negative rearing experiences, namely in experiences of shaming, rejection, emotional negligence/control, and several forms of abusive, critical and/or harsh parental styles (Claesson & Sohlberg, 2002; Stuewig & McCloskey, 2005; Webb, Heisler, Call, Chickering, & Colburn, 2007). According to the three-systems theory presented earlier, these interactions will overstimulate the threat system and understimulate the soothing system (Gilbert et al., 2008; Longe, Maratos, Gilbert, Evans & Volker, 2010). These experiences lead the individual to feel that he/she exists in the mind of others as undesirable, unattractive or defective, what Gilbert (1998, 2002) called external shame. Over time, the internalization of these shaming and devaluing experiences can result in individuals perceiving and evaluating themselves as flawed, inferior, inadequate and undesirable – internal shame (Gilbert, 1998, 2002; Matos, Pinto-Gouveia & Duarte, 2012). These processes will then influence one's proneness to shame and vulnerability to psychopathology (Matos & Pinto-Gouveia, 2009), such as SA (Cabete, 2016; Caiado, 2017; Matos, Pinto-Gouveia & Gilbert, 2013; Seabra, 2014).

Furthermore, the centrality of event theory proposes that memories of a trauma or a negative emotional event can become central to one's life story and identity, influencing everyday inferences

and future expectations, and that this may be related to increased levels of posttraumatic stress reactions, depression and anxiety (Berntsen & Rubin, 2006, 2007). Research has corroborated this theory, finding that early shame experiences can be recorded in autobiographical memory as central emotional memories, shaping a sense of self-identity, structuring the life narrative and forming a salient reference point to give meaning to other events (Pinto-Gouveia & Matos, 2011).

Trauma and adversity vs. resilience and posttraumatic growth

Shame memories from childhood and adolescence can reveal traumatic memory features, capable of prompting intrusions, strong emotional avoidance and hyperarousal symptoms, acting as threat-activating memories (Matos & Pinto-Gouveia, 2010). Such shame memories with traumatic and centrality characteristics have been found to increase current shame feelings and vulnerability to psychopathological symptoms, namely depression, anxiety (Matos et al., 2017b; Matos & Pinto-Gouveia, 2010, 2014; Matos, Pinto-Gouveia, & Costa, 2013; Pinto-Gouveia & Matos, 2011), SA and paranoia (Matos, Pinto-Gouveia & Gilbert, 2013). Early exposure to a traumatic event or adversity often results in a broad set of negative consequences, such as an increased risk for developing anxiety and stress-related disorders in adulthood (Heim & Nemeroff, 2001; Kendler et al., 1995; Spila, Makara, Kozak & Urbanska, 2008). However, it is recognized that the majority of individuals exposed to trauma do not develop subsequent psychopathology, with "resilience" therefore being more common (Bonanno, 2004).

Psychological resilience represents a multidimensional and multideterminant process (Herman et al., 2011; Rutter, 2012) and implies a relative resistance to stressful life experiences, being generally defined as a dynamic, interactive process of positive adaptation despite serious environmental challenges and risks (Luthar et al., 2000; Masten, Best & Garmezy, 1990; Rutter, 1987). Resilience has been conceptualized as an outcome, a trait and a process in which desired outcomes are developed (Bensimon, 2012; Lazarus, 1993; Walsh, 2007). Also, Collishaw and collaborators (2007) found that perceived parental care and in general harmonious relationships in adolescence and adulthood, as well as personality style, particularly low neuroticism, may build resilience against the potentially detrimental effects of childhood trauma.

In line with resilience, following a traumatic event, individuals can experience posttraumatic growth. There is some debate in the scientific community regarding these two constructs. Some believe they are similar (e.g. Masten & Wright, 2010) while others define posttraumatic growth as an experience of improvement, where, at least in some areas, individuals surpass what was present before the trauma or adversity (Tedeschi & Calhoun, 2004). Thus, we can say that posttraumatic growth has a quality of transformation, or a qualitative change in functioning (Tedeschi & Calhoun, 2004). Extraversion and openness to experience (Tedeschi & Calhoun, 1996), high levels of cognitive processing (Calhoun, Cann, Tedeschi, & McMillan, 2000; Ullrich & Lutgendorf, 2002), and social support (Weiss, 2000, 2002), among others, have been associated with this construct.

Several studies hypothesized that individuals who have SAD with childhood trauma appear to be significantly less resilient than those with no disorder (Chen, Ko, & Chang, 2018; Marx, Young, Harvey, Rosenstein & Seedat, 2017; Simon et al., 2009). However, other authors found that individuals who had experienced adversities and stressful life events were more resilient, by enhancing "steeliness" to future stressors, even in the presence of a mental disorder, suggesting that resilience is more than just the counterpart of psychopathology and adversity (DuMont, Widom & Czaja, 2007; Rutter, 2007). Regarding posttraumatic growth, only its relationship with trauma has been investigated, particularly, coping with medical diagnoses and bereavement (e.g. Calhoun, Cann, Tedeschi, & McMillan, 2000; Teixeira & Pereira, 2013). These studies conclude that posttraumatic growth has a positive association to psychopathology, since it is believed that events perceived as more distressing may result in greater motivation to make meaning of traumatic events, which subsequently leads to a greater experience of posttraumatic growth (Tedeschi & Calhoun, 1995). The authors state that both these effects can coexist, since they are different ways of experiencing reality, and positive and negative effects of traumatic events can coexist in the same person (Calhoun & Tedeschi, 1996; 2006).

Early memories of warmth and safeness

Early positive affiliative interactions and memories of experiencing safeness, warmth and nurturing during childhood are associated with well-being and health, self-accepting and nurturing abilities, acting as a protective factor regarding psychopathology (Cacioppo et al., 2000; Masten, 2001; Matos, Pinto-Gouveia, & Duarte, 2013, Matos et al., 2015; Richter, Gilbert, & McEwan, 2009; Schore, 2001). These early experiences of warmth and safeness (EMWS) promote the development of the affiliative soothing system, linked to one's ability to use affiliative positive emotions, such as compassion, generated within the self or others, to down-regulate the threat system and associated negative affective states (Gilbert, 2009).

On the other hand, the lack of EMWS with parents and peers has a direct effect in shame (Matos, Pinto-Gouveia & Duarte, 2013), inducing feelings of being seen negatively by others, and is correlated to higher psychopathological symptoms (Matos, Pinto-Gouveia & Duarte, 2013; Matos et al., 2017b; Richter et al., 2009), such as higher levels of SA (Caiado, 2017), being associated to an undeveloped soothing system, which undermines one's ability to create feelings of warmth and safeness within social relationships and effective emotional regulation (Gilbert, 2009, 2010; Matos & Pinto-Gouveia, 2014).

The present study

Some studies have already examined the relationship between the traumatic impact and centrality of shame memories and SA (e.g. Matos et al., 2013) and the relationship between posttraumatic growth and psychopathology (e.g. Teixeira & Pereira, 2013). Also, although there is

research exploring the impact of EMWS with parents and with peers on SA (e.g. Caiado, 2017), and the relationship between SA and resilience (e.g. Marx et al., 2017), to the best of our knowledge, there have been no studies relating early emotional memories, posttraumatic growth, and SA. Therefore, the general aim of this study was exploring the association between the traumatic impact and centrality of shame memories, EMWS with parents and peers, posttraumatic growth and SA. Particularly, this study aimed to explore if the traumatic characteristics of shame memories and the centrality of these experiences would have the same impact on SA and on posttraumatic growth, once, through the literature review, both posttraumatic growth and psychopathology could result from trauma-like experiences.

We expected that memories of the traumatic impact of early shame experiences, the centrality of shame memories, SA and posttraumatic growth would be positively correlated between themselves, and that the memories of the traumatic impact of early shame experiences, the centrality of shame memories and SA would be negatively correlated with EMWS with parents and peers, contrarily to posttraumatic growth, who would be positively correlated with EMWS with parents and peers (H1), We expected as well that memories of the traumatic impact of early shame experiences would have an influence on SA and posttraumatic growth (H2), and that this relationship would be mediated by the centrality of shame memories (H3). Finally, we also predicted all relationships between the above-mentioned variables would be moderated by EMWS with parents and peers (H4).

Method

Sample

A cross-sectional study with an adult Portuguese population was carried out to attain the above-mentioned objectives. Exclusion criteria were: being of foreign nationality, ages below 18 years old or above 60 years old, or evidence of random answers in the questionnaires. Two different samples (students and non-students) were collected to obtain a representative community sample.

Student Sample

This sample consisted of 357 college students, of which 206 (57.7%) were female and 151 (42.3%) were male. The participants mean age was 20.54 ($SD = 1.62$) and the average number of years of schooling was 13.05 ($SD = 1.49$). Only 22 (6.2%) of the students were receiving psychological counseling at the time. There were statistically significant differences in age (t $_{(354)} = - 3.04$, $p < .01$) and in school years (t $_{(332,580)} = 2.02$, $p < .05$) in relation to gender, but Cohen's d revealed that both gender differences were small ($d = .3$ and $d = .2$, respectively).

Non-student or General Adult Population Sample

This sample consisted of 158 subjects, of which 92 (58.2%) were female and 66 (41.8%) were male. The participants mean age was 42.83 (SD = 9.80) and the average number of years of schooling was 12.66 (SD = 2.99). Only 3 (1.9%) of these subjects were receiving psychological counseling at the time. The majority of the participants had a medium socioeconomic level (53.8%), 29.7% low, and 14.6% high. There were significant gender effects regarding age (t $_{(117,341)}$ = 2.19, p < .05) but Cohen's d revealed to be medium (d = .4). There were no gender differences regarding number of school years (t $_{(153)}$ = .30, p = .765) or socio-economic level ($\chi^2_{(2)}$ = 2.975, p = .226).

Total Sample

The total sample consisted of 515 subjects, of which 298 (57.9%) were female and 217 (42.1%) were male. The participants mean age was 27.36 (SD = 11.69) and the average years of schooling were 12.93 (SD = 2.07). The majority of the participants were students (69.3%) and therefore didn't had a socioeconomic level, followed by medium (16.5%), low (9.1%) and high (4.5%) socioeconomic levels. Only 25 (5.8%) of these subjects were receiving psychological counseling at the time. There were no statistically significant gender differences in age (t $_{(485,200)}$ = .84; p = .400), school years (t $_{(509)}$ = 1.42, p = .157) or socioeconomic level ($\chi2$ $_{(3)}$ = 3.01; p = .391).

Measures

A sociodemographic data questionnaire was administered in order to collect information regarding age, gender, number of years of schooling successfully completed, occupation, city of origin and psychological counseling. To achieve the objectives already mentioned, the following self-reported instruments were administered to the sample:

In this study, participants were provided with a brief introduction about the concept of shame, and then asked to remember a shame experience from childhood or adolescence with parents, peers, significant others, or a teacher. They were then instructed to answer the IES-R and CES based on the centrality and traumatic impact of this experience.

The *Impact of Event Scale – Revised* (IES-R; Weiss & Marmar, 1997; Portuguese version by Matos, Pinto-Gouveia & Martins, 2011) is a 22-item self-report scale designed to assess current distress for any specific life event, measuring three specific characteristics related to trauma: intrusion, avoidance and hyperarousal. Each item of the IES-R is rated in a 5-point Likert scale (0 = *Not at all*, 4 = *Extremely*). Although it was found a three-factor study in the original study, with alphas between .79 and .92, the Portuguese version revealed a single-factor structure with a Cronbach alpha of .96, and an acceptable test-retest reliability, convergent and divergent validity. In the present study the IES-R showed an excellent internal consistency (α = .95).

The *Centrality of Event Scale* (CES; Berntsen & Rubin, 2006; Portuguese version by Matos, Pinto-Gouveia, & Gomes, 2010) is a 20-item self-report scale that measures the extent to which a memory of a stressful event forms a reference point for personal identity and for the attribution of

meaning to other experiences in a person's life. Each item is rated in a 5-point Likert scale (1 = *Totally disagree*; 5 = *Totally agree*). This scale presented a very good reliability, with excellent internal consistency both in the original study and in the Portuguese version (α = .94 and α = .96, respectively) and an adequate convergent validity for the combined sample. In the present study, the scale showed an excellent internal consistency value (α = .96).

The *Posttraumatic Growth Inventory* (PTGI; Tedeschi, & Calhoun, 1996; Portuguese version by Teixeira & Pereira, 2013) is a 21-item self-report scale that assesses the level of positive change that occurred in a person's life as a result of an experience of adversity (in the present study, as a result of a significant shame experience). Each item is rated in a 6-point Likert scale (0 = *I did not experience this change as a result of the shame experience; 5 = I experienced this change to a very high level as a result of the shame experience*) in which higher scores indicate higher levels of growth. In its original version, the scale presented a factorial structure of five factors with good internal consistency: *new possibilities* (α = .84); *relationship with others* (α = .85); *personal strength* (α = .72); *spiritual change* (α = .85); and *appreciation for life* (α = .67). The Portuguese version includes these five factors as well, being the factors *spiritual change* and *appreciation for life* those with the most questionable internal consistency values (α = .69 and α = .62). The original version of the scale presents good test-retest validity (r = .71), good discriminant validity and good construct validity, and both the original and the Portuguese versions showed excellent internal consistency for the total scale (α = .90 and α = .94, respectively) and good concurrent validity. For the present study, only the total score was used, with excellent internal consistency (α = .97).

The *Early Memories of Warmth and Safeness Scale with Parents* (EMWSS-Parents; Caiado & Salvador, 2019) is a 21-item self-report scale that assesses the adult's memories of early positive emotional experiences (warmth and safeness) with parents, that was adapted from the original version of the EMWSS (Richter et al., 2009; Portuguese version by Matos, Pinto-Gouveia & Duarte, 2014) that assessed the presence of these memories in general (e.g. *I felt secure and safe with my parents* instead of *I felt secure and safe*). Each item is rated in a 5-point Likert scale (0 = *No, never*, 4 = *Yes, most of the time*) in which higher scores indicate more childhood warmth and safeness memories with parents. This scale had a single-factor solution and presented very good psychometric properties, with an excellent internal consistency (α = .95 for a student sample and α = .97 for a non-student sample). This version, in the present study, showed an excellent internal consistency (α = .98).

The *Early Memories of Warmth and Safeness Scale With Peers* (EMWSS-P; Ferreira et al., 2018) is a 12-item self-report scale, based on the original EMWSS (Richter et al., 2009) in which the original content of the EMWSS's items was modified to assess the specific dimension of adult's memories of early positive warmth and safeness peer-related experiences. Each item is rated in a 5-point Likert scale (0 = *No, never*, 4 = *Yes, most the time*) in which higher scores indicate the presence of more childhood warmth and safeness memories related to peer relationships. This scale had a single-factor solution and a very good internal reliability with an excellent internal consistency (α =

.97), convergent and divergent validity. In the present study, it showed an excellent internal consistency (α = .95).

The *Social Interaction Anxiety Scale* (SIAS; Mattick & Clarke, 1998; Portuguese version by Pinto-Gouveia & Salvador, 2001) is a 19-item self-report scale that measures social anxiety in the interaction with others. Each item is rated on a 5-point Likert scale (0 = *Not at all,* 4 = *Extremely*), with higher scores being associated with higher anxiety levels in social interactions. The original version presented an excellent internal consistency (α = .94 in a community sample and α = .93 in a social phobic sample), and the Portuguese version also showed good internal consistency (α = .90), test-retest reliability (*r* = .77), and concurrent validity. The cut-off point to consider the presence of social anxiety symptomatology was 35.95. For the current study, SIAS presented an excellent internal consistency (α = .94).

Procedure

This study was previously approved by the Ethics Committee of the Faculty of Psychology and Educational Sciences of the University of Coimbra. The student sample was obtained in 25 institutions of higher education (47 courses), particularly in Coimbra, Portugal, and the non-student sample was collected through the snowball method. In both samples, participants belonged to different districts from the North, Center and South of the country as well as the islands. Prior to the application of the research protocol, the subjects were informed about the study's confidentiality and their voluntary participation, and signed an informed consent. In paper format, all participants answered a series of self-reported questionnaires and a sociodemographic data questionnaire. The research protocol had an average duration time of 40 minutes and had two counterbalanced versions to prevent effects of fatigue and response contamination.

Data Analysis

The SPSS program (Statistical Package for the Social Sciences version 22; Armonk, NY: IBM Corp.) was used to conduct the data analyses and path analyses were performed using PROCESS computation tool for SPSS (version 3.3; Hayes, 2018).

Adherence to normality was determined by using the Kolmogorov-Smirnov test and outlier's analysis was performed by graphing the results (box diagrams). To analyze demographic variables and mean scores in all variables in study as well as the deviations by asymmetry (skeweness) and tailedness (kurtosis), descriptive statistics were executed. Multicollinearity was also examined by inspecting the correlation matrix for de independent variables and the tolerance and variance inflation factor (VIF < 5) (Kline, 2005). Differences between samples and gender differences in sociodemographic variables were tested using independent samples t–tests for continuous variables and qui-square for categorical variables (Field, 2013). The Cohen's (1988) criteria was used to interpret the effect size parameter, where Cohen's *d* values around .2 are considered small, .5 medium

and .8 large. The socioeconomic level (low, medium and high) was based on Simões' classification (1994). To calculate internal consistency indices for each instrument and respective factors, Cronbach's values of less than .60 were considered inadmissible, between .60 and .70 weak, between .71 and .80 acceptable, between .81 and .90 high, and between .91 and 1 excellent (Pestana & Gageiro, 2008). To carry out the correlations, Pearson correlation coefficients were executed to explore the relationships between the variables under study and sociodemographic variables, identifying possible covariates and analyzing the associations between variables, according to the hypotheses under study. To assess the magnitude of the correlations, we also considered Cohen's (1988) criteria, where a correlation coefficient of .10 is considered small, .30 medium and .50 large.
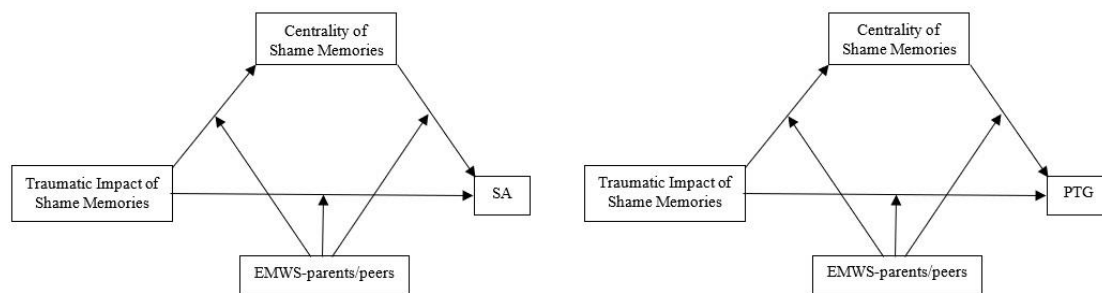
Figure 1. Hypothesized moderated mediation models (Model 59 in Hayes, 2018).
Note. EMWS-parents/peers = Early memories of warmth and safeness with parents and peers. PTG = Posttraumatic growth.

To examine the hypotheses aforementioned, specifically, the indirect and direct effect of memories of the traumatic impact of early shame experiences (independent variable) on SA or posttraumatic growth (dependent variables) through the centrality of shame memories (mediator), moderated by EMWS with parents and peers, two models of moderated mediation were created with PROCESS (Model 59 in Hayes, 2018; Fig. 1). Hence, in the current study, the moderator was hypothesized to affect the path that linked the independent variable and the dependent variables (direct effect), the path that linked the independent variable and the mediator, and the path that linked the mediator and the dependent variables. Prior to model estimation, the variables used in the construction of the products were mean-centered (Aiken & West, 1991). In the absence of one or more significant interactions, the model can be re-estimated after the removal of non-significant interactions (Hayes, 2018). The indirect or mediation effect was assessed using a bootstrapping procedure with 10,000 resamples. This procedure creates 95% bias-corrected and accelerated confidence intervals (95% BCa CIs) of the indirect effects, which are considered significant if zero is not contained within the lower and upper CIs. The significance was set at the .05 level.

Results

Preliminary Data Analysis

Missing values for the study variables were filled using the SPSS program (Transform – Replace missing values).

When differences between the student and non-student samples and gender in the study variables were investigated (*t* student for independent samples), we considered relevant that the students scored higher than non-students in all variables, and that there were significant population differences in age and in the study variable social anxiety, with large values of Cohen's *d* (*d* = 3.2 for age and *d* = .81 for social anxiety). Significant gender differences in the variable memories of the traumatic impact of early shame experiences were also revealed, but the Cohen's *d* value was considered small (*d* = .22). For this reason, we chose to control the effect of the population, using it as a covariate for the model in study. No severe violations to normal distribution of the variables were found, with values of kurtosis and skewness within normal values, and although there were outliers, after perceiving that there were no differences in results with and without outliers, it was decided not to eliminate them, to insure the ecological validity of the sample. There were no multicollinearity problems among study variables.

Pearson correlations between study variables and sociodemographic variables (age and gender) were tested (Table 1) and revealed medium or small significant associations between some variables in study and the sociodemographic variables mentioned. However, when the effect of the population was controlled in partial correlations (Table 1), all sociodemographic associations with study variables lost significance or correlation magnitude, which adds even more support to our decision to control the effect of the population but not of the gender.

Descriptive Statistics

It was considered pertinent to describe the qualitative variables of the recalled shame experience for each sample, identifying the type of shamer (Figure 2), its context (in the presence or absence of other people; Figure 3), and at what age it occurred (infancy or adolescence; Figure 4). The mean age for when the recalled shame experience occurred was of 13 years old for both the student (*M* = 13.13; *SD* = 3.83) and the non-student samples (*M* = 12.66; *SD* = 4.30). The means and standard deviations of the study variables are presented in Table 1.

Correlations

Table 1 presents Pearson and partial correlations (controlling for the effect of the population) between study variables, age and gender. The correlation analysis revealed that all significant associations went in the expected direction, the majority of which with medium correlation coefficients. Only the correlations of posttraumatic growth with EMWS with parents and peers went in the opposite direction expected. Notably, the significant, positive, and large correlation between PTGI, CES and IES_R reveals a never-studied relationship between posttraumatic growth, and the effect

centrality of shame memories and memories of the traumatic impact of early shame experiences have in one's life.
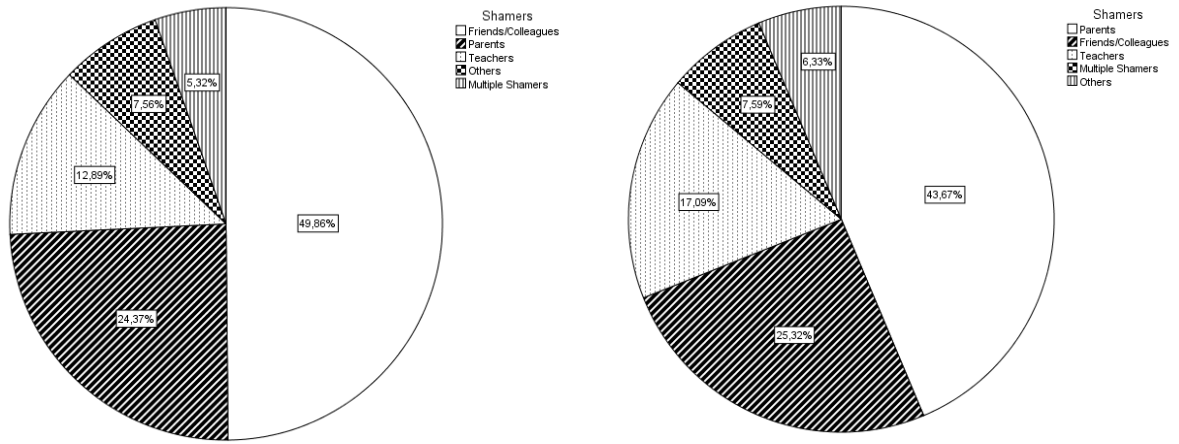

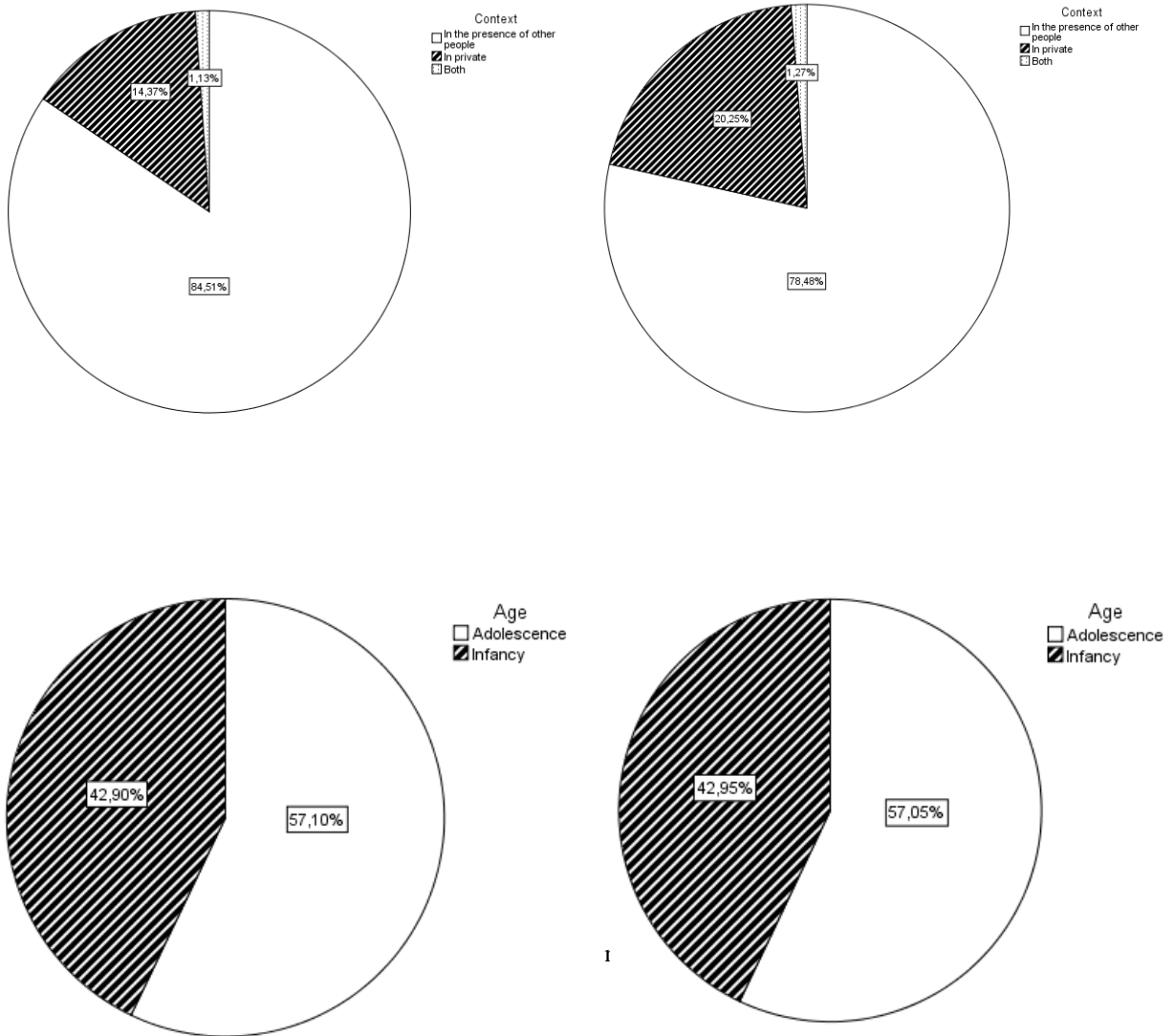*Figure 2.* Type of shamer for the student sample (left) and for the non-student sample (right).

Figure 4. Age of the subject when the recalled experience occurred for the student sample (left) and for the non-student sample (right).

Table 1. Means, standard deviation, and Pearson and partial correlations among study variables (N=515)

Variables	1	2	3	4	5	6	7	M (SD)
1. Age	-							27.36 (11.69)
2. Gender	-.03 (-.07)	-						-
3. SIAS	-.34*** (-.09*)	.003 (.004)	-					29.54 (15.65)
4. PTGI	-.10* (-.11*)	.02 (.02)	.20*** (.20***)	-				31.77 (27.03)
5. EMWSS_parents/peers	-.03 (-.03)	-.03 (-.03)	-.28*** (-.31***)	-.22*** (-.22***)	-			100.49 (22.43)
6. CES	-.08 (-.04)	.006 (.006)	.33*** (.33***)	.59*** (.59***)	-.31*** (-.31***)	-		41.71 (18.86)
7. IES_R	-.10* (-.02)	-.10* (-.10*)	.46*** (46***)	.48*** (.48***)	-.30*** (-.31***)	.63*** (.63***)	-	30.23 (19.03)

Note. Values outside parenthesis represent Pearson's correlations without controlling for population. Values inside parenthesis represent partial correlations after controlling for population. SIAS = Social Interaction Anxiety Scale. PTGI = Posttraumatic Growth Inventory. EMWSS_parents/peers = the total of EMWSS_parents and EMWSS_P together. IES_R = Impact of Event Scale – Revised. M = mean. SD = standard deviation. * $p < .05$, ** $p < .01$, *** $p < .001$.

Moderated Mediation Models Analysis

Initially, according to the hypotheses, two moderated mediation models were created (model 59 in Hayes, 2018; Fig. 1). However, it was found that EMWS with parents and peers only moderated the relationship between memories of the traumatic impact of early shame experiences and the centrality of

shame memories in both models. Therefore, non-significant interactions were removed and the models were re-estimated (Model 7; Hayes, 2018; Fig. 5), also with population as a covariate.
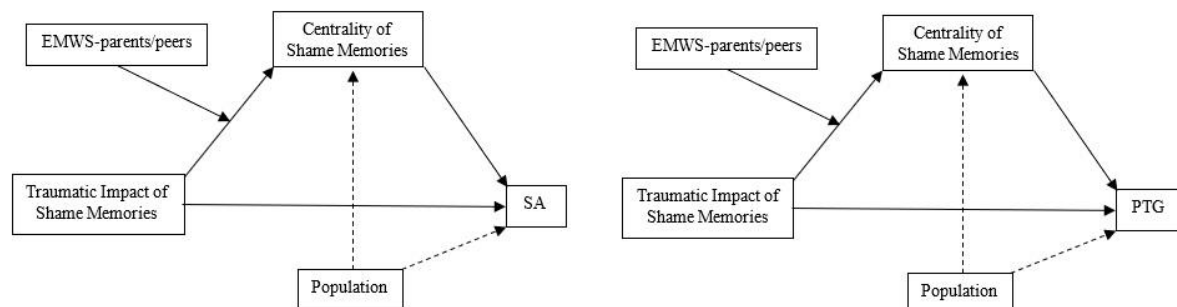

Figure 5. Re-estimated moderated mediation models (Model 7 in Hayes, 2018), controlling the effect of population (covariate).
Note. EMWS-parents/peers = Early memories of warmth and safeness with parents and peers. PTG = Posttraumatic growth.

T

he moderating role of EMWS with parents and peers on the relationship between Traumatic Shame Memories and Social Anxiety through Centrality of Shame Memories
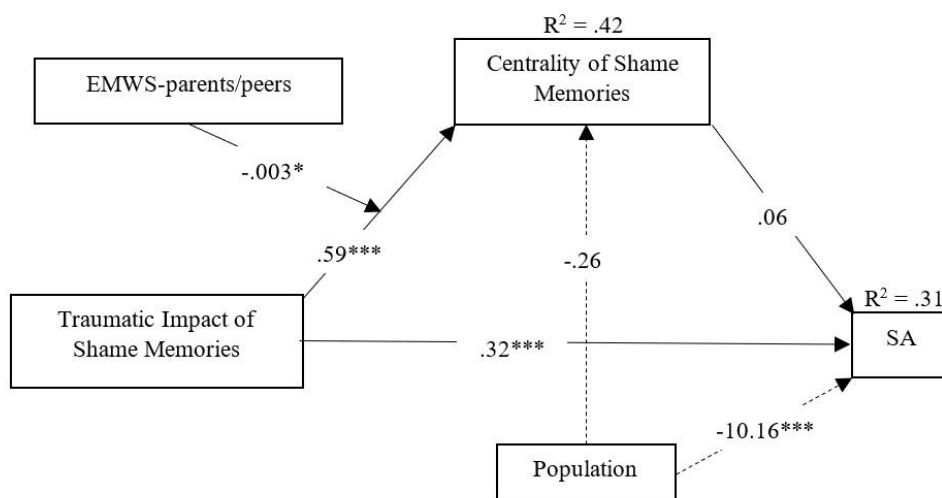

Figure 6. Moderated mediation model (Model 7) with population as a covariate.
Note. EMWS-parents/peers = Early memories of warmth and safeness with parents and peers. Path values represent unstandardized regression coefficients. * p < .05, ** p < .01, *** p < .001.

As presented in Fig. 6, the results showed that memories of the traumatic impact of early shame experiences had a significant and positive association with the centrality of shame memories, explaining 42.4% of its variance. Memories of the traumatic impact of early shame experiences were also positively and significantly associated with SA, while population was negatively and significantly associated with the same construct. Together with EMWS these variables explained 31% of SA variance. This model also presented a negative and significant moderating role of the EMWS with parents and peers on the relationship between memories of the traumatic impact of early shame experiences and the centrality of shame memories. However, the indirect effect of the centrality of shame memories on the relationship between memories of the traumatic impact of early shame experiences and SA was not significant, meaning that there wasn't a mediating effect, neither a moderated mediation. Table 3 presents the direct effects, indirect effects, and the index of moderated mediation.

Table 3. *Summary of the direct effects, indirect effects and index of moderated mediation*

Direct Effects	*b*	*SE*	*t*	*p*	*95% CIs*
IES_R → CES	.59	.04	16.63	< .001	.52 / .66
IES_R → SIAS	.32	.04	8.01	< .001	.24 / .40
CES → SIAS	.06	.04	1.43	.154	-.02 / .14
Population → CES	-.26	1.40	-.19	.853	-3.00 / 2.48
Population → SIAS	-10.16	1.30	-8.01	< .001	-12.65 / -7.67
Indirect Effects	*b*	*SE*	*t*	*p*	*95% CIs*
IES_R → CES → SIAS (low levels of EMWS)	.04	.03	-	-	-.02 / .09
IES_R → CES → SIAS (medium levels of EMWS)	.03	.03	-	-	-.02 / .08
IES_R → CES → SIAS (high levels of EMWS)	.03	.03	-	-	-.02 / .08
Index of moderated mediation	*Index*	*SE*	*t*	*p*	*95% CIs*
IES_R → CES → SIAS	-.0002	.0002	-	-	-.0005 / .0001

Note. b = unstandardized regression coefficient; *SE* = standard error; *p* = statistical significance; *CI* = confidence interval. IES_R = Impact of Event Scale – Revised. CES = Centrality of Shame Scale. SIAS = Social Interaction Anxiety Scale.

The moderating role of EMWS with parents and peers on the relationship between Traumatic Shame Memories and Posttraumatic Growth through Centrality of Shame Memories
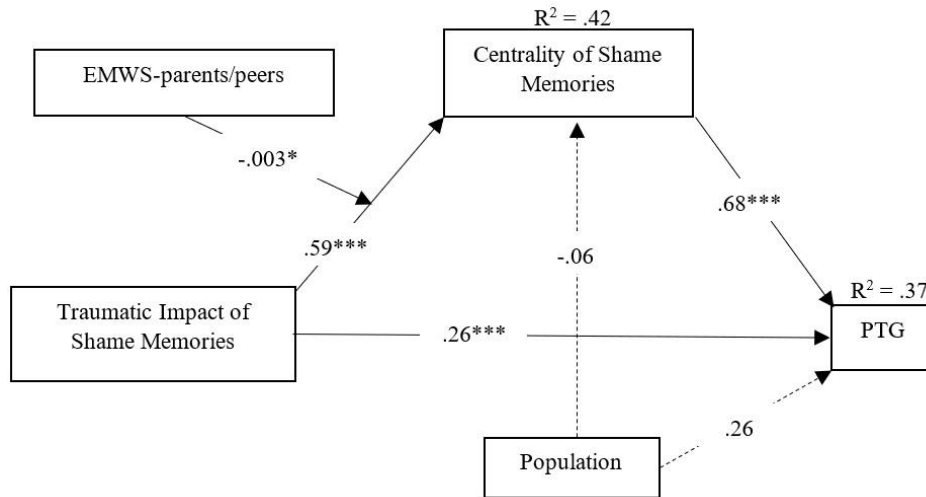

Figure 7. Moderated mediation model (Model 7) with population as a covariate.
Note. EMWS-parents/peers = Early memories of warmth and safeness with parents and peers. PTG = Posttraumatic growth. Path values represent unstandardized regression coefficients. * p < .05, ** p < .01, *** p < .001.

As presented in Fig. 7, the results showed that memories of the traumatic impact of early shame experiences had a significant and positive association with the centrality of shame memories, explaining 42.1% of its variance. Memories of the traumatic impact of early shame experiences were also positively and significantly associated with posttraumatic growth, as well the centrality of shame memories, both explaining (together with EMWS) 36.8% of its variance, meaning that there was a mediating effect of the centrality of shame memories on the relationship between memories of the traumatic impact of early shame experiences and posttraumatic growth. This model also presented a negative and significant moderating effect of the EMWS with parents and peers on the relationship between memories of the traumatic impact of early shame experiences and the centrality of shame memories, in all levels of EMWS with parents and peers. Furthermore, according to the index of moderated mediation, a significant moderated mediation was present in this model. In Table 4 are described the direct effects, indirect effects and the index of moderated mediation.

Table 4. *Summary of the direct effects, indirect effects and index of moderated mediation*

Direct Effects	b	SE	t	p	95% CIs
IES_R → CES	.59	.04	16.53	< .001	.52 / .66
IES_R → PTGI	.26	.07	4.02	< .001	.13 / .39
CES → PTGI	.68	.07	10.35	< .001	.55 / .81
Population → CES	-.06	1.40	-.04	.966	-2.80 / 2.68
Population → PTGI	.26	2.08	.13	.900	-3.83 / 4.35
Indirect Effects	**b**	**SE**	**t**	**p**	**95% CIs**
IES_R → CES → PTGI (low levels of EMWS)	.45	.06	-	-	.34 / .56
IES_R → CES → PTGI (medium levels of EMWS)	.39	.05	-	-	.30 / .48
IES_R → CES → PTGI (high levels of EMWS)	.36	.05	-	-	.27 / .46
Index of moderated mediation	***Index***	**SE**	**t**	**p**	**95% CIs**
IES_R → CES → PTGI	-.002	.0009	-	-	-.004 / -.0002

Note. b = unstandardized regression coefficient; *SE* = standard error; *p* = statistical significance; *CI* = confidence interval. IES_R = Impact of Event Scale – Revised. CES = Centrality of Shame Scale. PTGI = Posttraumatic Growth Inventory.

Discussion

The relationship between childhood or adolescence adversity and later psychopathology seems to be immensely complex, multifactorial and involving several dynamically interacting biopsychosocial moderating and mediating variables (Hoppen & Chalder, 2018). Due to the traumatic characteristics a memory of a shame experience can have (Matos & Pinto-Gouveia, 2010), these memories of early shame experiences can also be considered as adversity or trauma, capable of increasing vulnerability to psychopathology, such as SA (Matos, Pinto-Gouveia & Gilbert, 2013). According to the evolutionary theory, SA is a product of the threat system, resulting from the fact that these individuals tend to perceive social relationships as a threat, dealing with social situations in a competitive way, being more concerned with social rank, than behaving in an affiliative way (Gilbert, 2001; Schlenker & Leary, 1982). Furthermore, there is increasing research stating that EMWS with parents and peers are associated with the development of the affiliative soothing system, which can down-regulate the threat system (Gilbert, 2009), and act as a protection against psychopathology (e.g. Matos, Pinto-Gouveia & Duarte, 2013; Richter et al., 2009). Moreover, an experience that can cause traumatic impact is usually associated with a greater experience of posttraumatic growth, since, it is considered as an incentive to change the way to face life (Janoff-Bulman, 2006; Tedeschi & Calhoun, 1995; Teixeira & Pereira, 2013).

Therefore, to further understand these processes and what mechanisms are associated with them, this study's general aim was to explore the association between early emotional memories, posttraumatic growth and SA, and to compare how memories of the traumatic impact of shame

experiences, and possibly consequent centrality, can impact on SA and/or posttraumatic growth, since both these constructs could result from trauma-like experiences.

As hypothesized (H1), memories of the traumatic impact of shame experiences, the centrality of shame memories, SA and posttraumatic growth were positively and significantly associated with each other. The correlation between memories of the traumatic impact of shame experiences and the centrality of shame memories was in line with previous studies (e.g. Matos et al., 2017b; Matos & Pinto-Gouveia, 2014), as well as the correlations between these two variables with SA (Matos, Pinto-Gouveia & Gilbert, 2013), having been found that levels of traumatic and central characteristics in shame memories were associated with higher levels of SA. Our correlation coefficients appeared to be higher than those in the mentioned study, probably due to the use of a different measure for SA (Matos et al., study used the Social Interaction and Performance Anxiety and Avoidance Scale, and in this study the Social Interaction Anxiety Scale was used).

The significant association between traumatic and central characteristics in shame memories and posttraumatic growth revealed a never-studied positive association, that can be conceptualized according to Tedeschi & Calhoun theory (1995), that presupposes that in order to experience posttraumatic growth, perceived stressful/traumatic events must be present; in this case, the perceived stressful or traumatic events were the traumatic and central characteristics of the recalled shame experiences. The positive correlation between SA and posttraumatic growth extends previous work on the association between posttraumatic growth and psychopathology, in which it is hypothesized that higher levels of psychopathology lead to higher levels of posttraumatic growth (e.g. Jin, Xu & Liu, 2014; Teixeira & Pereira, 2013), since for posttraumatic growth to occur in response to a stressful event, the set of circumstances the individual faces must present a significant degree of threat to the preexisting assumptive world (Calhoun & Tedeschi, 2004).

However, in the same hypothesis, it was also expected that memories of the traumatic impact of shame experiences, the centrality of shame memories and SA would be negatively correlated with EMWS with parents and peers, while posttraumatic growth would be positively correlated to EMWS with parents and peers. Results revealed that a negative correlation occurred in all these variables, including in the correlation we thought to be positive, between posttraumatic growth and EMWS with parents and peers. The negative correlation between SA and EMWS with parents and peers was in line with other studies, such as Caiado's (2017), which means that less EMWS with parents and peers are associated with higher levels of SA. Likewise, the negative correlation between traumatic characteristics of shame memories and the centrality of these experiences and EMWS with parents and peers is also already well documented in studies that found a negative relationship between EMWS and shame (e.g. Roças, 2014), and between EMWS and the memories of the traumatic impact of early shame experiences (e.g. Matos et al., 2015; Matos, Pinto-Gouveia & Duarte, 2013). Regarding the negative correlation between posttraumatic growth and EMWS with parents and peers, it would be expected that these two variables would be positively correlated with each other, due to its protective

factor regarding psychopathology (Masten, 2001; Richter et al., 2009), and the fact that posttraumatic growth is seen as an experience of improvement (Tedeschi & Calhoun, 2004). Trying to make sense of the opposite result, we hypothesized that, since posttraumatic growth is positively associated with psychopathology and with trauma, once these variables are negatively associated with EMWS with parents and peers, posttraumatic growth would be too. We hypothesize that if trauma variables were controlled, the association of posttraumatic growth and EMWS would be positive.

It was also investigated if memories of the traumatic impact of early shame experiences had an influence on SA and on posttraumatic growth (H2), and, as hypothesized, there was a positive and significant direct effect both on SA and on posttraumatic growth. Regarding SA, this direct effect was in line with the evolutionary theory and subsequent studies regarding memories with traumatic impact characteristics (Matos & Pinto-Gouveia, 2010, 2014), which presupposes that these early shame memories with trauma-like symptoms (intrusions, hyperarousal and avoidance) could have the function to keep the person in an alert state, thus activating the threat system, to avoid the same type of shame experiences and their negative consequences. And why are these shame experiences so feared? Because these experiences with traumatic impact represent a threat to the social self and self-identity, due to the fact that the individual may feel he is losing abilities to create desirable images of the self in the mind of others, which thus can lead to rejection or exclusion of the group (Gilbert, 1998, 2007), and compromises survival (Baldwin, 2013).

Regarding the influence memories of the traumatic impact of early shame experiences had on posttraumatic growth, to the best of our knowledge, no other study has yet investigated this direct effect or association. According to Tedeschi and Calhoun theory (2006), we can hypothesize that this direct effect existed due to its similarity to the direct effect trauma has on posttraumatic growth, since these shame experiences become impactful enough to produce trauma-like symptoms; therefore, and bearing in mind that there is already research proving that the stronger the trauma experience, the higher the motivation for the individual to make mean of the traumatic event (Tedeschi & Calhoun, 1995), we can hypothesize this direct effect.

Moreover, and in line with our third hypothesis (H3), the centrality of shame memories were found to be a significant mediator between memories of the traumatic impact of shame experiences and posttraumatic growth, pointing to the fact that a significant part of the impact of traumatic shame characteristics on posttraumatic growth is due to the fact that these experiences acquired a central role in identity. According to Bernsten and Rubin (2006), having a highly negative emotional or traumatic event as central to personal identity probably means that this event is seen as representative for the person's self and might lead to internal global and stable attributions, with the experience being seen as causally related to characteristics of the self that pertain across situations. In light of this theory, Pinto-Gouveia and Matos (2011) stated that a shame experience can become a salient turning point to an individual's life story and a central component of a person's identity, a rather similar definition to what Janoff-Bulman (2006) considers to be an experience capable of prompting posttraumatic growth:

that it needs to be central enough to the self to shatter previous assumptions, presenting a significant degree of threat to the pre-existing assumptive world (Calhoun & Tedeschi, 1998, 2004; Janoff-Bulman, 2006). Furthermore, several studies report that the relationship between the level of the traumatic experience and posttraumatic growth may be curvilinear (Fontana & Rosenheck, 1998; Kleim & Ehlers, 2009; Linley & Joseph, 2004; Shakespeare-Finch & Lurie-Beck, 2014). This means that although a reasonable degree of exposure to a traumatic event is necessary, extremely high trauma-related symptoms may not result in any increase in experienced growth, due to the fact that perceived trauma may simply overwhelm the psychological resources of most persons. Future studies could try to control and analyze this process.

Opposite to what was found in posttraumatic growth, centrality of shame memories was not a significant mediator in the relationship between memories of the traumatic impact of shame experiences and SA. This result is extremely interesting, since it seems to show that, unlike the impact of the same variables on posttraumatic growth (where centrality in an essential feature to develop posttraumatic growth), shame memories with traumatic features do not need to be central to lead to social anxiety. In order to support this theory, further studies should be conducted.

Finally, it was predicted that EMWS with parents and peers would moderate the relationship between memories of the traumatic impact of early shame experiences and centrality of shame memories, for both models (H4). The moderation was negative and significant in both models (and in the model of posttraumatic growth, all the mediation was considered to be moderated), although with a small coefficient, which means that we can hypothesize that the presence of this variable can reduce or buffer the relationship between memories of the traumatic impact of early shame experiences and centrality of shame memories, which implies that if a person as enough EMWS with parents and peers, it can reduce the effect a shame memory with traumatic features can have in one's life, reducing the possibility for it to become central to a person's identity. However, due to its small coefficient, we cannot be entirely sure about this moderation, and because of that further studies should be conducted, specifically with a wider sample.

Clinical Implications

The obtained results suggest that clinicians should evaluate and work with these types of early memories, specifically, early shame memories, in order to address and reconstruct the meaning associated with the recalled experiences, thus helping to decrease their possible centrality to the self, current levels of shame and anxiety symptoms, as well as to understand if these memories and their traumatic impact are the ones to predispose patients to, psychopathology, in this case, the development of social anxiety.

Patients should also learn about the social rank, social mentalities and the three-system theories, in order to better understand their functioning, and to later stimulate the soothing system, since it could be deactivated due to the lack of EMWS with parents and peers, while the threat system

is overdeveloped. One way to stimulate the soothing system would be through the development of compassion (from the self and from the others), in a way to reduce shame (decreasing the activation of the threat system), and to promote posttraumatic growth. It should be important that, in a therapeutic setting, patients worked on the concept of posttraumatic growth as a positive change that may occur after an experience of adversity, such as memories of the traumatic impact of shame experiences, by being encouraged to pursue social support and deliberated rumination, in order to make means of the traumatic shame experience.

Limitations, Contributions and Future Studies

There are some limitations in the present study. First, and most important, due to the fact that it is a cross sectional study, results can only be interpreted as associations and not as predictions. Furthermore, the fact that this study is not a longitudinal study evaluating the same subjects, as children/adolescents and in the future as adults (students or non-students), does not allow us to guarantee that the expected outcomes are only due to the hypothesized mediators and moderators. Given these two limitations, it would be important to replicate the present study in a longitudinal design. Another important limitation is the fact that the sample used for this study was a community sample, thus pointing to the relevance of replicating the study in a clinical sample of socially anxious individuals. This study could also be more complete if we also assessed memories of early shame experiences without traumatic impact and used them as a control variable, to investigate whether or not it is the traumatic impact of these experiences that has an effect on social anxiety and not the experiences themselves. Therefore, future studies could investigate this possibility. We believe as well that due to the nature of some of the questions in our measures and since a questionnaire assesses social anxiety, responses might have been biased by conformity to social desirability. Further studies might wish to add measures that allow researchers to control for the effect of social desirability in responses. Similarly, the fact that we ask subjects to recall an experience from infancy or adolescence may question the validity of the study, due to negative memory biases during affective episodes. Despite the plausibility of the models tested here, there may be other concurrent explanatory models for these relations using other variables or considering other types or directions of association. These concurrent models could be tested in future studies. As the data shows, most of the remembered shame experiences with traumatic impact were in the presence of others. Although we could not test it here, the context could be a deciding factor in whether shame experiences have a traumatic impact or not. The presence of other people could represent exclusion and humiliation by the group and not just by one person, enhancing perceptions of being criticised and diminished for actions or attributes of the self that others find undesirable or unattractive (Gilbert, 1998), consequentially enhancing shame feelings and presenting a more severe threat to the social self (Gilbert, 2003). Moreover, since feeling safe, connected and supported in attachment and social relationships is linked to affiliative positive affects and well-being, and promotes resilience against adverse life events (Cacciopo et al., 2000),

future studies could also investigate the protective effects of recalls and current experiences of feeling soothed, safe and connected with others on the associations between our study variables.

Despite these limitations, the present study is innovative and with relevant contributions. This is the first study to show that the traumatic impact of early shame experiences is associated with post-traumatic growth and that this relationship as well as the same relationship with SA is mediated by centrality of shame memories, extending previous finding on the traumatic nature of early shame experiences (e.g., Matos, Pinto-Gouveia & Gilbert, 2013). Furthermore, it is the first study to associate posttraumatic growth with social anxiety.

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