Title: When the threat system is turned on: The impact of anger and shame on paranoia

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Abstract

This paper aims to understand the nature of anger response and explore the relationship between anger, shame, depression and paranoia beliefs. Firstly, this study analyzed the contribution of the external shame and depression to the prediction of the components of anger. Secondly, it investigated the contribution of anger, external shame and depression to the prediction of paranoia. The sample consists of 208 individuals from community population, with a mean age of 32.67 (*SD* = 11.15) and years of education mean of 13.60 (*SD* = 3.97). Results show that external shame and depressive symptoms have a significant and an independent contribution for current feelings of anger (state-anger) and for expression of anger toward people and objects (anger-out). Key in this study was the finding that trait-anger temperament appeared as the best global predictor of paranoid beliefs, followed by external shame and depressive symptoms. Overall, these results may provide new perspectives on the nature of anger, highlighting the interrelationship between threat-defensive emotions and its impact on psychopathology.

Keywords: Threat system; anger; shame; depression; paranoia

When the threat system is turned on: The impact of anger and shame on paranoia

An adaptationist perspective is guided by the simple assumption that the mind comprises many mental adaptations, each of which is the product of natural and sexual selection operating over many generations during the course of human evolution (Buss, 2004). The different social challenges, operating over the evolution process, have given rise to the evolution of a variety of social motivations to create certain types of social role. These social roles include ways of relating, such as care eliciting/seeking, care-giving, co-operating, mate selecting and mating and competing (Gilbert, 2000a, 2005). Such innate strategies or social mentalities guide their hosts via motives and emotions. Positive and negative emotions are often elicited by different social signals indicating success or failure in a social role (Bailey, 1987; Gilbert, 2000a). Indeed, emotions affect the way that we think and behave in a variety of personal and social contexts (Clore, Schwarz, & Conway, 1994; Morris & Keltner, 2000). Through social interactions, we learn to give meaning to the stimulus that can elicit emotions and to the meaning of the experience of emotion itself. Although the basic emotions are innate responses, the learning may change their expression through the emotional inhibition, the social context and reinforcement (Greenberg, Rice, & Elliott, 1993). As a result, the learning and knowledge about our emotions depends of the social interactions and the feedback obtained by the interaction between our minds and others' minds (Gilbert, 2005; Greenberg et al., 1993; LeDoux, 1998). Thus, when we perceive the others as hostile, harmful, and threatening, this creates negative feelings (e.g., contempt, anger, shame) and makes the world unsafe (Buss, 2004; Gilbert, 1989, 1993). So, when environments are threatening, humans have often rapidly access to an evolved menu or suite of strategic responses (ways of attending, feeling, behaving and thinking) to aid adaptive responding. The most appropriate/efficient response in face of a threat of a predator is to

become anxious and run away; if someone takes something out or frustrates us or treats us unfairly, the best thing to do will be to feel anger and express it with aggressive attitudes and threat (Gilbert, 2000a, 2005). Thus, in face of threat and/or ambiguous situations, the brain process firstly the threat signals and then displays defensives outputs. Secondly, the brain analyse positive stimulus, which the basic rule is "better safe than sorry" (LeDoux, 1998; Panksepp, 1998; Gilbert, 2000a,b).

Gilbert (2007a, b) suggest that the anxiety (avoid, escape), anger (attack) and disgust (avoid, expel) are included in the protected-strategies of the brain, designed as the detection-threat and protection-seek strategies. So, these emotions have the function of provide ways of innate knowledge about specific signals (Greenberg, 2002). Thus, these basic emotions involve attention, vigilance and sensitivity to potential threats or losses, and are mediated by the limbic system (e.g., amygdala), by physiological processes (e.g., cortisol and serotonin), and include dispositions such as fight, escape, submission and help seeking (Gilbert, 2001; Gilbert, & Irons, 2004a, b; Panskepp, 1998). Different negative situations (e.g., loss, threat, humiliation, criticism, exploitation by others) can trigger these defensive emotions (e.g., anxiety, anger, shame, sadness), that are quickly and automatically recruited to deal with those social threats. Besides their defense function, such emotions often mismatch and conflict each other for expression, and individuals can become frightened of them or lose control of them (Gilbert, 2009). The focus of protection and safety-seeking strategies is on coping with threats by escaping or hiding, or avoiding the threat acting aggressively to detect or submit it, or acting submissively to deflect it. These defensive strategies include fight, escape, avoidance, immobilisation, submission and fleeing to a 'safe base' (LeDoux, 1998).

Regarding to the experience and expression of anger, this emotion has been explored from different theoretical perspectives. According to social rank theory, humans are highly sensitive and responsive to rank related social threat signals (Price, Sloman, Gardner, Gilbert, & Rohde, 1994; Sloman, 2000). Both acquisitive and defensive human behaviour are centred on the desires to gain and fear of losing attractiveness in the minds of others (Gilbert, 1992, 2000, 2003, 2007a). In humans, concerns that one has traits that others disapprove or do not value (e.g. not good enough, inadequate), or lacking valued abilities (e.g. physical attractiveness) gives rise to perceptions of being of low rank in valued and self-identity. This experience of inferiority, inadequacy and unvalued is known as shame (Andrews, 1998; Gilbert & Andrews, 1998; Lewis, 1992; Tangney & Dearing, 2002). External shame is characterized by evaluations focused on those aspects we believe others would reject or attack if they became public. At a cognitive level external shame refers to how one thinks others see the self (Allan, Gilbert, & Goss, 1994; Goss, Gilbert, & Allan, 1994). Shame can be internalized, whereby we have negative views and feelings of our own attributes or behaviours (Kaufman, 1989; Cook, 1996). Individuals who act based on a threat social rank mentality, seek and strive to be valued by others, fight for status and social position, compete for resources, are hypersensitive to the evaluation and social comparison and have a high sensitivity to shame (Gilbert, 2005, 2006).

Furthermore, in these intra-groups conflicts, individuals who have a low and inferior social rank position report more submissive behaviours, social anxiety, paranoid thoughts and angry thoughts and feelings (Allan & Gilbert, 2002; Freeman et al., 2005; Gilbert, Boxall, Cheung, & Irons, 2005). Paranoia can be conceptualized as a defensive strategy that helps in detection of threats to the self from potential hostile and harmful others, that have underpin the conditional rule of human mind “better safe than sorry”

(Gilbert, 2005; Freeman, 2007; Freeman et al., 2002, 2004, 2005; Gilbert, 1998, 2001; Gilbert et al., 2005; Salvatore et al., 2011). Thus, paranoid beliefs may be adaptive in some contexts, for example, low, instable or vulnerable self-esteem and attachment difficulties (Pickering, Simpson, & Bentall, 2008). However, when individuals see themselves as inferior, unvalued, and see others as hostile, threatening and harmful, it may trigger a malevolent other-focused explanatory style in order to preserve the safety feeling of self and of the world. Paranoid individuals tend to believe that others conspired, discriminated, threatened or intentionally victimized them, and consequently have poor or absent interpersonal relationships (Matos, Pinto-Gouveia, & Gilbert, 2013; Pinto-Gouveia, Matos, Castilho, & Xavier, 2012). These individuals appear to live in a hostile, rather cold world, where affiliating emotions and behaviours are blocked (Mills, Gilbert, Bellew, McEwan, & Gale, 2007).

Another way to deal with feelings of being criticized and unvalued by others is the externalization and counter-attack, which are associated to feelings of anger and revenge fantasies. Therefore, the evaluation or judgment that others treat the self as more inferior than what the individual feels, is associated with anger and aggressive behaviours (Gilbert et al., 2006). This suggests that anger is a defensive emotion highly associated with an external attribution style (blame others) for being criticized or put down (Eckhardt, Barbour, & Stuart, 1997; Gilbert & Miles, 2000).

The anger's eliciting events are related to goals, or something we want is blocked, or if we are criticized, or if someone takes advantages of us or in some way behaves unfairly or cheated us (Gilbert, 1993, 2003; Gilbert & Miles, 2000; Gilbert, Gilbert, & Irons, 2004; Gilbert, Irons, Olsen, Gilbert, & McEwan, 2006). The feeling of anger includes several experiences and organizes our mind in specific ways, including physical sensations (e.g., tension, heart increase, pressure to act), cognitive (e.g.,

attention/thinking focused on threat) and behaviour or motivations (e.g., aggressive display). Trait-anger or anger-proneness consists in a general non-specific disposition to be quick-tempered with a tendency to overtly express anger (Forgays, Forgays, & Spielberger, 1997). This component of anger reflects individual differences in the tendency to experience and express anger (Forgays, Spielberger, Ottaway, & Forgays, 1998). The anger-state consists of an intense transitory reaction linked to an experience of being criticized or being unfairly treated by others (i.e., heightened reaction to criticism) (Allan & Gilbert, 2002). This means that rank sensitive individuals may express more feelings of anger. The feelings of anger may be internalized (anger in), i.e., individuals tend to suppress feelings of anger and irritability. This component of anger expression is associated to psychopathology (Allan & Gilbert, 2002). Riley and colleagues (1989) show that anger arousal (trait anger and suppression of anger) are associated with depression in a clinical sample. In turn, the anger externalization (anger out) refers to the tendency to express the anger outwardly (for individuals or objects) and may contain violent, aggressive physical or verbal behaviours (Forgays et al., 1997). In contrast, some individuals may try to control the expression of anger (anger control).

Both anger and shame can become pathological and in particular, shame feelings have been linked to several clinical conditions such as depression (Gilbert, 1992, 1998, 2004b), paranoia (Matos et al., 2013), social anxiety (Gilbert, 2000b; Gilbert & Miles, 2000), personality disorders (Linehan, 1993; Rush et al., 2007). Some studies have shown that paranoid beliefs occur in a continuum of severity from non-clinical to clinical populations (Lopes, 2011; Barreto, 2010) and are almost as common as depressive and anxiety symptomathology (Freeman, 2007; Freeman et al., 2005; Johns

et al., 2004; Van Os & Verdoux, 2003). Nevertheless, the relationship between anger and paranoia remain less investigated.

Thus, this study aims to explore the relationship between anger, shame, depression and paranoia beliefs. Firstly, we set out to study the nature of anger response. Specifically, we analysed the contribution of the external shame and depression to the prediction of the components of anger. Secondly, we investigated the contribution of anger, external shame and depression to the prediction of paranoia.

Method

Participants

Participants in this study were 208 subjects from general community population. 52.9% were males (n = 110) and 47.1% females (n = 98). The mean age is 32.67 (SD = 11.15) and the participants years of education mean is 13.60 (SD = 3.97). Concerning marital status, 53.8% of the participants are single (n = 112), 38.5% are married or in a relationship (n = 80), 6.7% are divorced (n = 14) and 1% are widows (n = 2). The majority's sample have middle class professions (65.9%, n = 137). There are significant differences regarding age and years of education in this sample. Males are older than females (M = 34.73, SD = 12.04 *vs.* M = 30.37, SD = 9.59). Additionally, females have more years of education than males (M = 14.32, SD = 3.49 *vs.* M = 12.95, SD = 4.25).

Procedures

A battery of self-report questionnaires was administered to participants by the authors, within the staff of institutions, namely private corporations. These institution's boards were contacted, the research aims were clarified and authorization was obtained

so that their employees could participate in the study. Afterwards, the personnel was elucidated about the investigation goals and invited to voluntarily participate. Then, self-report questionnaires were filled by volunteers in the presence of the researcher. In line with ethical requirements, it was emphasized that participants cooperation was voluntary and that their answers were confidential and only used for the purpose of the study.

Measures

Shame

Other As Shamer Scale (OAS; Goss, Gilbert, & Allan, 1994; Portuguese version by Matos, Pinto-Gouveia, & Duarte, 2014). The scale consists of 18 items measuring external shame (global judgments of how people think others view them). For example, respondents indicate the frequency on a 5-point scale (0–4) of their feelings and experiences to items such as, '*I feel other people see me as not quite good enough*' and '*I think that other people look down on me*'. Higher scores on this scale reveal high external shame. In their study, Goss et al. (1994) found this scale to have a Cronbach's alpha of .92.

Anger

State-Trait Anger Expression Inventory (STAXI; Spielberger, 1988; Spielberger & Sydeman, 1994). The STAXI is a 44-item instrument that requires respondents to make self-ratings along a 4-point scale. Five scales from the STAXI were selected for use in this study. These scales were described in the STAXI manual as follows: (i) State Anger – "The intensity of angry feelings at a particular time", (ii) Trait-Anger temperament and reaction – "general propensity to experience and express anger without specific provocation", (iii) Anger-In – "The frequency with which angry

feelings are held in or suppressed", (iv) Anger-Out – "how often an individual expresses anger toward other people or objects", (v) Anger-Control – "the frequency with which individual attempts to control the expression of anger (Spielberg, 1998, p.1). Internal consistency reliabilities reported in the STAXI manual range from .73 to .93.

Depression

Depression, Anxiety and Stress Scales (DASS-42; Lovinbond & Lovinbond, 1995; Portuguese version by Pais-Ribeiro, Honrado, & Leal, 2004) is a self-report measure of 42 items and designed to assess three dimensions of psychopathological symptoms: depression, anxiety and stress. The items indicate negative emotional symptoms and the respondents are asked to rate each item on a 4-point scale (0–3). In the original version, Lovibond and Lovibond (1995) found the subscales to have high internal consistency (Cronbach alphas: .91 for depression subscale; .84 for anxiety subscale; and .90 for stress subscale). In this study, only the depression subscale of the *DASS-42* was used.

Paranoia

General Paranoia Scale (GPS) was developed by Fenigstein and Vanable (1992) and translated and adapted into Portuguese by Lopes and Pinto-Gouveia (2005). This 20-item self-report is the most widely used dimensional measure of paranoia (Freeman et al., 2005). The GPS was designed to measure paranoia in college students, particularly, the following characteristics: the belief that another person, or a powerful external influence, is commanding the individual's thoughts and behaviours (e.g., "*Someone has been trying to influence my mind*"); the belief of a conspiracy against oneself, i.e. others are working together to conspire against the individual (e.g., "*My parents and family find more fault in me than they should*"); the belief of being spied on

and talked negatively about oneself behind one's back (e.g., "I *sometimes feel as if I am being followed*"); a general suspicion regarding others and a lack of trust on people (e.g., "*It is safer to trust no one*.") and finally the presence of feelings of resentment (e.g., "*I am sure I get a raw deal from life*"). Each item is rated on a 5-point Likert scale (1-5). Scores can range from 20 to 100, with higher scores indicating greater paranoid ideation. Fenigstein and Vanable (1992) found this scale to have good internal consistency across their four North-American samples (Cronbach $\alpha = .84$).

Results

Data analysis

All analyses were conducted using PASW (Predictive Analytics Software), version 18 (SPSS Inc., Chicago, IL, USA) for PCs. Independent sample t tests were carried out to test for gender differences and two-tailed *Pearson correlation coefficients* were performed to explore the relationships between external shame, angry feelings (State Anger, Anger-In, Anger-Out, Anger-Control, Trait-Anger temperament), depression and paranoia (Cohen, Cohen, West, & Aiken, 2003; Tabachnick & Fidell, 2007). *Hierarchical multiple regression models* were used to analyse the relative contribution of external shame to the prediction of angry feelings. We also analyse the relative contribution of external shame and angry feelings to the prediction of paranoid beliefs (Cohen et al., 2003).

Preliminary Data Analyses

Data were screened for normality of distribution and outliers. Preliminary analyses revealed a largely and normally distributed sample (Skewness values < 3 and Kurtosis values < 10; Kline, 2005). Furthermore, a series of tests were conducted to

examine the suitability of the current data for regression analyses. Analysis of residuals scatter plots showed that the residuals were normally distributed, had linearity and homoscedasticity. Also, the independence of the errors was analysed and validated through graphic analysis and the value of Durbin–Watson (values ranged between 1.709 and 1.968). Regarding multicollinearity or singularity amongst the variables, Variance Inflation Factor (VIF) values indicated the absence of β estimation problems (VIF < 5). Overall, these results suggest that these data are adequate for regression analyses.

Descriptives

The means, standard deviations and Cronbach's alphas for all variables are presented on Table 1. All scales showed good to very good internal consistencies. Gender differences were tested for and no significant differences were found in all variables. Therefore, all statistical analyses were conducted in the total sample. Regarding demographic variables (i.e., age and years of education), correlation analysis were conducted between these variables and shame, angry feelings, depression and paranoia beliefs. No significant correlations were found, except for Trait-anger and years of education (r = -.25, $p \leq .001$), paranoia beliefs and years of education (r = -.20, $p \leq .001$) and Anger-control and age (r = .25, $p \leq .001$). For this reason, we control the effect this demographic variables in regression analysis.

[insert Table 1]

Study I: Anger, Shame and Depression

Correlation analysis

The potential difficulties in multicolinearity were analysed and no high multicolinearity were found in the majority of variables, except for depression, and therefore, subsequent statistical analyses were conducted by control their effect.

External shame was significantly and positively correlated with trait-anger temperament (r = .53, p < .001), state anger (r = .45, p < .001), anger-in (r = .25, p < .001), and anger-out (r = .39, p < .001). In contrast, external shame was negatively associated with anger-control (r = -.44, p < .001). External shame have a high and significant correlation with depressive symptoms (r = .59, p < .001). Angry feelings, in particular trait-anger temperament (r = .53, p < .001), state anger(r = .46, p < .001), anger-in (r = .23, p < .001), and anger-out (r = .43, p < .001), were significantly and positively correlated with depression symptoms. Anger-control was negatively associated with depression symptoms (r = -.44, p < .001).

Regression Analyses

To better understand these results, the relative contribution of depressive symptoms and external shame to the prediction of different dimensions of angry feelings were examined through hierarchical multiple regression analyses.

Trait-Anger Temperament and Reaction

A hierarchical multiple regression analysis was performed, using age, years of education and depression symptoms (DASS-42) and external shame (measured by OAS) to predict trait-anger temperament and reaction (subscale Trait-Anger measured by STAXI) (Table 2).

On step one, we entered age, years of education and depression symptoms as predictors and a statistically significant model was produced, $F_{(3,204)} = 36.27$, $p \leq .001$. On step two, we further included external shame as predictor variable and the model was also significant and accounted for 41% of trait-anger temperament variance. In this final model, external shame emerged as the best global predictor ($\beta = .34$, $p \leq .001$), followed by depression ($\beta = .28$, $p < .001$), years of education ($\beta = -.27$, $p = .001$) and

age (β = -.20, p =.001), suggesting that these variables have an independent effect on trait-anger temperament variance (Table 2).

State-Anger

Similar procedures were conducted in order to explore the best predictors of state anger (measured by STAXI) (Table 3).

On step one, we entered depressive symptoms as predictor variable and it produced a statistically significant model, $F_{(1,206)} = 54.85$, $p \leq .001$, accounting for 25% of the variance in state anger. On step two, we further included external shame as predictor and the model was also significant and accounted for 25% of state anger variance. In this final model, depression emerged as the best predictor of state anger (β = .30, p <.001) followed by external shame (β = .27, p < .001) (Table 3).

Anger-out

Similarly, a hierarchical multiple regression analysis was conducted, using depression and external shame (measured by OAS) to predict anger-out (measured by STAXI) (Table 3). On step one, we entered depressive symptoms as predictor variable and it produced a statistically significant model, $F_{(1,206)} = 45.89$, $p \leq .001$, accounting for 17.8% of the variance in anger-out. On step two, we further included external shame as predictor and the model was also significant and accounted for 20% of anger-out variance. In the final model, depression (β = .31, $p \leq .001$) and external shame (β = .21, p = .008) are both significant predictors of anger-out (Table 3).

Anger-control

Similar statistical procedures were conducted in order to explore the significant predictors of anger-control (measured by STAXI) (Table 2). On step one, we entered age, years of education and depressive symptoms as predictor variables and they produced a statistically significant model, $F_{(3,204)} = 23.49$, $p < .001$, accounting for 25%

of the variance in anger-control. On step two, we further included external shame as predictor and the model was also significant and accounted for 28% of anger-control variance. In this final model, age (β = -.26, $p \leq .001$), depression (β = -.26, $p \leq .001$) and external shame (β = -.26, $p \leq .001$) have an independent and significant effect on the variance of anger-control (Table 2).

[insert Table 2 and Table 3]

Study II: Anger, Shame, Depression, and Paranoia

Correlation analysis

External shame have a high and significant correlation with paranoia beliefs (r = .62, p < .001). Regarding angry feelings, there significant and positive correlations between multi-dimensions of anger and paranoia beliefs. In particular, paranoia was significantly and positively correlated with trait-anger temperament (r = .62, p < .001), state anger (r = .44, p < .001), anger-out (r = .41, p < .001) and anger-in (r = .28, p < .001). In contrast, paranoia beliefs was negatively associated with anger-control (r = -.39, p < .001). Additionally, there are a significant and positive correlation between depressive symptoms and paranoia beliefs (r = .61, p < .001).

Regression analysis

Finally, in order to understand these results and the relative contribution of depressive symptoms and external shame to the prediction of paranoia beliefs, a hierarchical multiple regression analysis was conducted. In this analysis, we used age, years of education, depression symptoms (DASS-42), external shame (measured by

OAS), Trait-Anger temperament and state-anger (subscales measured by STAXI) to predict paranoia beliefs (measured by GPS) (Table 4). On step one, we entered age, years of education and depressive symptoms as predictor variables and they produced a statistically significant model, $F_{(3,204)} = 42.62$, $p < .001$, accounting for 38% of the variance in paranoia. On step two, we further included external shame as predictor and the model was also significant and accounted for 48% of paranoia variance. On final model, we further introduced trait-anger temperament, state-anger, anger-out, anger-in and anger-control as predictor variables and they produced a statistically significant model, accounted for 54% of total variance in paranoia. In this final model, trait-anger temperament is the best predictor ($\beta = .34$, $p \leq .001$), followed by external shame ($\beta = .29$, $p \leq .001$) and depressive symptoms ($\beta = .27$, $p \leq .001$) (Table 4).

[insert Table 4]

Discussion

Our biosocial motivations for attachment, status, reproduction and achievements are guide by emotions. Research in emotional processing has shown the existence of integrated circuits in our brain that leads to different types of emotions which regulate our motivations (LeDoux, 1998; Panksepp, 1998). Thus, our brain contains three types of emotion regulation systems which one design with a specific purpose (Depue & Morrone-Strupinsky, 2005). The function of threat-defensive system is to detect threats and respond automatically to them with defensive behaviours (such as fight, flight, and freeze) and emotions (for example, shame, anxiety, anger or disgust). It is a system orientated for ‘better safe than sorry’ rule (Gilbert, 1998, 2003, 2005) and is easily conditioned.

Empirical studies have consistently shown that shame experiences, which can recruit emotions of anxiety, disgust and anger, are typically associated with self-perception of being criticized, devalued, and disapproved by others for attributes or behaviours that others find unattractive and undesirable (Gilbert, 1998; Tangney, Miller, Flicker, & Barlow, 1996). In addition, several studies demonstrate the role of shame in vulnerability to psychopathology, particularly depression (Sloman & Gilbert, 2000), social anxiety (Cox, Fleet, & Stein, 2004) and paranoia (Matos et al., 2013; Gilbert & Miles, 2000). Concerning feelings of anger, this is a common emotional experience of feeling shamed and criticised by others (Tangney et al., 1996). Theoretical approaches and some studies have suggested that anger, aggression and hostility are associated with an external attributional style (i.e., blame others) for being criticised, devalued or humiliated (Eckhardt et al., 1997; Gilbert, 2010). However, the nature of anger and its implications for paranoia beliefs remain less investigated.

This study set out to explore whether external shame and depression predict the components of anger. Furthermore, it aims to study the contribution of these threat-defensive emotions (i.e., anger, external shame and depression) to the prediction of paranoia.

Regarding demographic variables, the results show that individuals with more years of education tend to present lower levels of anger temperament and propensity to experience and express anger without provocation stimulus, as well as paranoid beliefs. These results may be due to the higher levels of literacy, which may allow the learning and using strategies more adaptive to deal with dispositional temperament for experience and express anger, and paranoia ideation (e.g., re-evaluation of threat stimulus that is an ability recruit by evolved brain; LeDoux, 1998; Panskepp, 1998). Additionally, results demonstrate that older individuals seem to have a greater attempt

to control their anger feelings. In our point of view, this result seems to be related to maturity and mastery of certain skills that may facilitate the coping with anger.

The results from Study I about the relationship between anger, shame and depression revealed that when people believe that they exist in the mind of others as inferior and unvalued tend to have more anger-proneness, to experience an intense transitory reaction of anger, to suppress feelings of anger and irritability and to express the anger outwardly. As expected, lower levels of external shame are associated to a higher ability to control angry feelings in an adaptive way. These findings support the bio-psychosocial model for shame (Gilbert, 1998, 2002, 2003, 2010). According to this approach, shame is a self-conscious emotion that arises in competition dynamics for social attractiveness, emerging from our evolved cognitive competences for processing social and self-information. Thus, it evolved as a defensive strategy to keep the self-safe from potential attacks (e.g., punishment, rejection and criticism) from others. This experience of other as a threat to the self and self-identity can trigger two major defences: one is the internalized shaming response, when the individual adopts a subordinate strategy associated with self-devaluation and self-criticism; the other is an externalizing and humiliated response when the individual displays dominant and aggressive behaviours (e.g., anger) (Gilbert, 1998, 2002, 2003, 2010). Moreover, shame, as a self-centred emotion, is an output of defence-threat system, which recruit negative and threat based emotions (e.g. anger) (Gilbert, 2010).

This study also demonstrates that external shame is highly linked to depressive symptoms, as expected and in line with the state of art of shame and shame memories (Matos & Pinto-Gouveia, 2010; Matos et al., 2013; Pinto-Gouveia & Matos, 2011; Pinto-Gouveia et al., 2012).

Finally, the results from correlation analyses suggest that feelings of anger, particularly their dimensions (trait-anger temperament, state anger, anger-in, and anger-out) are associated with depressive symptoms. In contrast, individuals who are able to control the expression of anger tend to experience lower levels of depressive symptoms.

Overall, these findings demonstrate that when the threat system is turned on, it triggers threat-defensive emotions (such as, anger, sadness, anxiety, disgust), that alert and urge us to take action and do something about the threat stimulus in order to self-protection.

Depression can arise when certain basic human social needs for affection, sense of belonging and emotional support, are blocked or people cannot create these relationships (Gilbert, 1992). Others social marks for depression are competitive defeats and loss of control over social resources, which are linked to different types of depressive symptoms, such as anhedonia, shame, anger, frustration and pessimism (Carvalho et al., 2013; Keller & Nesse, 2006; Nesse, 1998). Clinical evidence shows that depressed patients report irritable mood and anger associated. Indeed, this response of involuntary defeat strategy is often accompanied by frustration that may underpin anger feelings (Price & Sloman, 1987; Price et al., 1994).

Taken together these findings, we further investigate the contribution of demographic variables (age and years of education), external shame and depressive symptoms to predict various components of angry feelings. In particular, the trait-anger temperament and reaction is explained by heightened feelings of external shame and depressive symptoms, less literacy and youth. Results also show that external shame and depressive symptoms have a significant and an independent contribution for current feelings of anger (state-anger) and for expression of anger toward people and objects (anger-out). In addition, our findings revealed that older individuals, who have lower

levels of depressive symptoms and external shame, tend to control the expression of anger.

Concerning results from Study II about anger, shame, depression and paranoia, we found that external shame is associated with paranoid beliefs. As expected, depression is linked to paranoid beliefs. These findings are in accordance with prior research (Pinto-Gouveia et al., 2012) that shows the impact of emotional memories through external shame on paranoid beliefs.

Our results add to the previous research that individuals who have more trait-anger temperament, express anger outwardly and inwardly, tend to have more paranoid beliefs. Additionally, individuals with difficulties in control the feelings of anger also tend to have more paranoid beliefs.

Key in this study was the finding that trait-anger temperament appeared as the best global predictor of paranoid beliefs, followed by external shame and depressive symptoms. Overall, these findings are in line with the evolutionary and bio-psychosocial model for shame (Gilbert, 2010). So, individuals who perceive themselves as inferior to others and feel put down, rejected, criticized and excluded by others may then develop suspicious and paranoid beliefs in order to create a sense of personal security (Gilbert et al., 2005; Freeman et al., 2005). This externalization and counter-attack response is mostly associated to feelings of anger and revenge fantasies. This automatic defensive response involves an over-activation of the social rank mentality and an under-stimulation of the safeness system (Gilbert, 2009, 2010).

Clinical implications

This study may contribute to a better understanding the nature of anger response and its different components, highlighting how shame and depression are related to

anger. Furthermore, this study may allow a better knowledge about the role of anger, external shame and depression on paranoia.

Despite the use of a non-clinical sample, some clinical implications might be considered from our findings. Firstly, with patients who have anger feelings and aggressive behaviours, it seems particularly appropriate to put in the clinical picture issues related to external shame (Gilbert, 2004a,b, 2006, 2009; Gilbert & Irons, 2005; Gilbert & Procter, 2006). Moreover, for paranoia, our results emphasize the importance of treating not only external shame and low mood, but also anger. This suggests that the development of adaptive strategies may be useful to cope with anger. For instance, compassion focused therapy appears to be an adequate therapeutic approach to address this threat-defensive system (e.g., anger, shame, depression, paranoia) (Gilbert, 2009, 2010).

Limitations & Future research

There are some limitations in this study. First, this is a cross-sectional design and no causal conclusions can be drawn from our results. Future prospective studies should be carried out to enhance the understanding on the causal relation between the variables. Secondly, our findings should be replicate in other populations, such as clinical samples, adolescents and elderly. Finally, our results are based on self-report measures and the use of other assessment methods (for example, clinical interviews focused on shame and anger features) seems to be useful and necessary. Nonetheless, this study seems to improve the knowledge about the nature of anger response.

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Table 1

Means, standard deviations and Cronbach's alpha for all variables in study (N = 208)

	Total (*N* = 208)		
Variables	***M***	***SD***	**α**
External Shame (OAS)	19.94	10.98	.92
Trait-Anger (STAXI)	20.53	5.56	.85
State-Anger (STAXI)	13.25	5.47	.93
Anger-In (STAXI)	16.82	4.13	.72
Anger-Out (STAXI)	13.95	4.00	.78
Anger-Control (STAXI)	20.66	5.81	.89
Depression (DASS-42)	8.20	8.46	.94
Paranoia (GPS)	45.56	11.66	.91

Note. OAS = Other as Shamer Scale; STAXI = State-Trait Anger Expression Inventory; DASS-42 = Depression Anxiety and Stress Scales; GPS = General Paranoia Scale.

Table 2

Model summary and Beta values for hierarchical multiple regression analyses for trait-anger and anger-control (STAXI) as dependent variables (N = 208)

	Trait-Anger				**Anger-control**			
	R	**R^2**	**F**	**β**	**R**	**R^2**	**F**	**β**
Step 1	.59	.35	36.27***		.51	.26	23.492***	
Age				-.210***				.274***
Years Education				-.261***				.114
Depression				.477***				-.408***
Step 2	.65	.42	26.038***		.55	.30	12.732***	
Age				-.195***				.262***
Years Education				-.270***				.120
Depression				.279***				-.256***
External shame				.337***				-.259***

Note. ***$p \leq .001$

Table 3

Model summary and Beta values for hierarchical multiple regression analysis for State-Anger and Anger-Out (STAXI) as dependent variables (N = 208)

	State-Anger				Anger-Out			
	R	**R^2**	**F**	**β**	**R**	**R^2**	**F**	**β**
Step 1	.46	.21	54.845***		.43	.18	45.891***	
Depression				.459***				.427***
Step 2	.51	.25	13.315***		.46	.20	7.205**	
Depression				.300***				.306***
External shame				.271***				.206**

Note. **$p \leq .01$, ***$p \leq .001$

Table 4

Model summary and Beta values for hierarchical multiple regression analysis for paranoia (GPS) as dependent variable (N = 208)

	R	**R^2**	**F**	**β**
Step 1	.62	.39	42.619***	
Age				.006
Years Education				-.098
Depression				.597***
Step 2	.70	.49	42.218***	
Age				.024
Years Education				-.109
Depression				.360***
External shame				.403***
Step 3	.75	.56	5.823***	
Age				.080
Years Education				-.020
Depression				.269***
External shame				.291***
Trait-anger				.336***
State-anger				.020
Anger-Out				-.006
Anger-in				.019
Anger-control				.035

Note. ***$p \leq .001$