Summary
A Conceptual, Neuropsychological and Psychopathological Review on Guilt and Shame

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Guilt and shame are self conscious, moral emotions felt upon personal failures or mistakes. They are both negative emotions that involve self evaluation and they have a major role in the regulation of social behavior (Moll, de Oliveira-Souza and Eslinger, 2003; Schulkin, 2004). Despite these similarities, these two emotions can be distinguished from each other in many aspects. One approach in the differentiation of guilt and shame is the public/private distinction, which states that shame is experienced in the presence of others while guilt is a private emotion (Ausubel, 1955; Benedict, 1946; Combs, Campbell, Jackson and Smith, 2010; Smith et al., 2002). This approach, however, is no longer valid since both shame and guilt were shown to appear in the presence of others (Tangney, Wagner, Hill-Barlow, Marschall and Gramzow, 1996). A more valid approach is the self/behavior distinction, which states that in shame the focus is the self while in guilt the focus is the behavior (Lewis, 1971; Lindsay-Hartz, 1984; Tangney, 1989; Wicker, Payne and Morgan, 1983). In shame self is perceived as small, worthless and weak, which makes it a stronger and more painful emotion compared to guilt (Lewis, 1971; Lindsay-Hartz, 1984; Tangney, 1989; Tangney, Wagner and Gramzow, 1992b; Wicker et al., 1983). As a result of this, shame leads to escape and hiding behavior, while guilt encourages confession, apologetic behavior and compensation of the damage given to others (de Hooge, Zeelenberg and Breugelmans, 2007; Ketelaar and Au, 2003; Lewis, 1971; Sheikh and Janoff-Bulman, 2010; Tangney et al., 1996; Wicker et al., 1983).

Individuals show different tendencies in terms of guilt and shame. Shame proneness is associated with anger, aggression, hostility, personal distress, low self-esteem and neurotisizm (Cohen et al., 2011; Tangney, 1991; Tangley et al., 1992a). Guilt prone people, on the other hand, tend to react less aggressively and are less involved in criminal behavior (Stuewig et al., 2010; Stuewig and McCloskey, 2005; Tangney et al., 1996).

They are also less likely to repeat criminal behavior if they committed any crime (Tangney, Stuewig and Martinez, 2014).

Cultural Differences

The emotions guilt and shame show differences in different cultures in terms of the concepts they are associated with and the intensities they are experienced. Differences can be well observed between the Western cultures, which encourages individualism, and Asian cultures, which prioritize interdependency (Kitayama, Markus and Matsumoto, 1995). For instance in Western cultures guilt is associated with responsibilities to others, while shame is specifically associated with self and does not involve responsibilities to others. In Chinese culture, however, shame involves anxiety felt for family members, who constitute an important part of self (Bedford and Hwang, 2003). Another difference was observed between Italian and Indian subjects. Italian subjects experience guilt for a longer period, while Indian subjects experience shame longer. Indian subjects are also more guilt prone and more shame prone compared to Italian subjects (Anolli and Pascucci, 2005). Consistent with this, in more individualist American culture individuals experience emotions more intensely and for a longer time compared to Japanese subjects (Matsumoto, Kudoh, Scherer and Wallbott, 1988). To sum up, different components of culture such as perception of self contributes to the proneness, intensity and duration of self conscious emotions shame and guilt.

Guilt, Shame and Psychopathologies

Moral emotions such as shame and guilt serve self regulatory roles when they are experienced at functional doses. Consequently, any problems in the mental processing of these emotions can interfere with adaptive and moral behavior. For instance, lack of guilt and remorse is a characteristic of psychopathy (Hare, 1991; Lykken,

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1995). High doses of both guilt and shame, on the other hand, are associated with depression, although shame is thought to be more pathogenic and a better predictor for depression (Orth, Berking and Burkhardt, 2006; Tangney, 1992). Guilt proneness, however, is more of an indicator for obsessive-compulsive disorder (Tangney et al., 1992b).

High levels of shame proneness, due to its more destructive nature involving negative perception of self, comes out as an important factor in psychopathologies such as social anxiety (Gilbert, 2000; Gilbert and Miles, 2000; Gilbert and Trower, 1990), alcoholism (Bradshaw, 1988; Brown, 1991), drug addiction (Cook, 1994; Dearing et al., 2005; O'Connor, Berry, Inaba, Weiss and Morrison, 1994), narcissism (Morrison, 1989) and suicidal behavior (Mokros, 1995).

High levels of shame also constitutes an important barrier in the treatment of these psychopathologies (Grant, Kim and Crow, 2001; Marques, Weingarden, Leblanc and Wilhelm, 2011) and consistent with this successful cognitive behavioral therapies were shown to reduce levels of shame (Hedman, Ström, Stünkel and Mörtberg, 2013).

Neuropsychology of Guilt and Shame

Understanding the representation of guilt and shame in the brain is crucial considering their self regulatory function and their involvement in psychopathologies. Recent brain imaging techniques help us understand the brain regions that are responsible for these emotions.

Prefrontal cortex stands out in many of the brain imaging studies, which try to understand the brain regions that are important in guilt. Ventromedial prefrontal cortex, which was previously associated with the observation of mental state of self and the others (Castelli, Happé, Frith and Frith, 2000; Frith and Frith, 2001) as well as moral judgement (Greene et al., 2001; Heekeren, Wartenburger, Schmidt, Schwintowski and Villringer, 2003), was shown to be activated upon guilt inducing sentences (Takahashi et al., 2004). Prefrontal cortex and its involvement in guilt was supported by further studies that showed its activity upon induction of guilt either by scenarios (Moll et al., 2007; Morey et al., 2012) or autobiographical stories (Wagner et al., 2011). It was also shown that the activity of right orbitofrontal cortex region of the prefrontal cortex increased with higher levels of guilt (Wagner et al., 2011).

A second brain region that came out as being responsible for guilt is the superior temporal sulcus (STS) (Takahashi et al., 2004), which is known to be involved in the perception of biological movement (Grezes, 1998; Puce, Allison, Bentin, Gore and McCarthy, 1998; Puce et al., 1998; Wicker, Michel, Henaff and Decety, 1998;

Calder et al., 2002), anticipation of the intention and behavior of the others (Allison, Puce and McCarthy, 2000), and finally predicting the aims and results of any behavior (Frith and Frith, 1999). These functions of the STS might play a key role in understanding the negative effect of behaviors on the other people, which is an important component of guilt.

Some subcortical regions are also known to be activated upon guilt. Anterior cingulate cortex and insula, which are involved in empathy and perspective taking (Bernhardt and Singer, 2012; Decety and Jackson, 2004), were found to be activated upon autobiographical guilt experiences (Shin et al., 2000). These two regions have intense neural connections with temporal lobe and prefrontal cortex, which were also activated by guilt (Shin and ark., 2000). Subgenual cingulate cortex (SCC) also came out in one of the studies, which stated this region was activated upon guilt inducing scenarios (Zahn, de Oliveira-Souza, Bramati, Garrido and Moll, 2009). This region is known to be associated with sadness (George et al., 1998; Mayberg et al., 1999) and its activity is known to be higher in patients with depression (Drevets, 2000; Ressler and Mayberg, 2007).

In addition to the studies above, which focused on the representation of guilt in the brain, another research focused on the different brain activity in guilt and shame. It was found that more frontal lobe activity was measured in guilt, while amygdala and insula were activated more in shame (Michl et al., 2014). Shame and guilt result in very different behavioral outcomes and they are associated with different psychopathologies, but at the same time they can coexist upon some experiences (Eisenberg, 2000). Therefore more neuroimaging studies are required to differentiate between these two emotions.

Assessment of Guilt And Shame

Correct assessment of guilt and shame is an important issue considering the clinical outcomes of these emotions. Differentiation between guilt and shame stands as a challenge in the accurate assessment of these emotions because they tend to coexist (Eisenberg, 2000). For instance early assessment questionnaires such as Forced-Choice Guilt Inventory (Mosher, 1966), Situational Guilt Scale (Klass, 1987) and Revised Shame Guilt Scale (Hoblitze, 1987) failed to differentiate between shame and guilt. Another challenge in the assessment of guilt and shame is, even very educated people find it difficult to define these emotions (Tangley, 1989). Thus, questionnaires that rely on individuals to name their emotions, such as Personal Feelings Questionnaire (Harder and Lewis, 1987), could be unsuccessful. As an alternative to the methods above, The Self-Conscious Affect and Attribution Inventory (Tangney, 1990)

and Test of Self Conscious Effect (Tangney, Wagner and Gramzow, 1989; Tangney, Wagner and Gramzow, 1992b) was used. These were scenario based tests, in which subjects were asked to report what they felt upon the scenarios given. These tests were mostly criticized for measuring what was reported rather than what was felt. Test of Self Conscious Effect (TOSCA-3) (Tangney, Dearing, Wagner and Gramzow, 2000) is the most commonly used questionnaire, which is based on self/behavior distinction of guilt and shame. Dimensions of Conscience Questionnaire (Johnson et al., 1987), which is known to give consistent results with TOSCA-3 (Wolf et al., 2010) was used to develop Guilt and Shame Scale (Şahin and Şahin, 1992) in Turkish.

Discussion

Self conscious and self regulatory emotions guilt and shame are distinct emotions in terms of both their focus (self/behavior) and behavioral results (hiding/compensation of the damage). They tend to coexist and show cultural differences, which makes them difficult to separately define and assess. Due to their distinct behavioral and clinical results, it is crucial to separately measure proneness to these emotions and understand their representations in the brain.

Recent brain imaging techniques has been helpful in understanding the neural basis of guilt and shame. Prefrontal cortex, STS and amygdala were shown to be associated with these emotions. These brain regions are also known to be involved in Theory of Mind (ToM) (Gallagher and Frith, 2003), which explains our abilities to understand the mental states of others considering their independent beliefs and desires. This function is also very important in predicting the outcomes of our behaviors in others, which is the basis of moral emotions such as guilt and shame. Therefore these neural networks and the consequent functions of our minds might be evolved together.