

**Do punitive ostracism experiences add to our understanding of obsessive compulsive beliefs and their relationship to obsessive compulsive symptoms? An exploratory study and pilot of a new measure.**

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Over the years, I have been privileged to work with many clients who have courageously revealed their struggle with obsessions and compulsions and the painful aspects of their social world. It was the shared themes amongst their experiences that planted the seed that eventually grew into this study. I am also grateful to those visionary academics whose work has inspired me and in particular to Paul Gilbert for his astounding insight and for his compassionate encouragement and interest during the course of this project. Thank you to Sue Clement and Eric Gardiner whose experienced guidance kept me on course and to Peter Oakes whose pertinent commentary and enthusiasm prevented me from flagging and helped me to reach the finish line. I am especially grateful to the many individuals who participated in the research. My family have offered practical and moral support throughout, and my thanks go to them. In particular, thanks to Ben, Zoë and Daniel for uncomplainingly sharing me with this project, and for balancing my world; and to Andy for his ongoing support and encouragement (and for all the cups of tea).

## **Abstract**

This study makes a case for a biopsychosocial model of OCD that draws together fragmented bodies of evidence and understandings from different academic fields. Evidence for biological and psychological contributions to the aetiology and maintenance of the disorder are reviewed with particular attention to the cognitive appraisal model. The cognitive model does not fully explain the high inter-relationships between OCD-related belief domains or why collectively they have specificity for predicting OCD over and above other disorders, implying that another variable may underlie these domains. The traditional conceptualisation of cognition may benefit from being broadened to encompass biological and social aspects. Ostracism research, neuroscientific evidence, evolutionary theory and psycho-linguistic theory (specifically dialogism theory, which conceptualises thinking as dialogue between internalised “voices”) may cast further light on a common domain contributing to different OCD-relevant beliefs. The term “punitive ostracism experiences” (POE) is coined to describe a variable that may form this common domain. POE consists of memories of non-contingent punitive ostracism in childhood; unforgiving self-to-self relating; and social information processing bias reflected in attributions of ostracism intent in ambiguous situations. POE was operationalized using existing and adapted measures and a new intent attributions measure which was constructed for the purposes of this study. The constituent variables of POE were hypothesised to contribute to the variance of obsessive beliefs factors and to explain some of the relationship between obsessive beliefs and obsessive compulsive symptoms in a non-clinical sample. Evidence that is supportive of this hypothesis is presented. Conclusions are drawn and suggestions for future research are made. Implications for clinical practise are also considered.

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**1. Introduction**

**1. 1 The Challenge of Obsessive Compulsive Disorder**

It has been estimated that at any given time, 1.1% of the UK population suffers from obsessive compulsive disorder (OCD) (Torres et al 2006), with estimates of lifetime prevalence varying from 1.6% (Kessler, Berglund, Demler, Jin, & Walters, 2005) to 2.5% (Karno, Golding, Sorenson, & Burnam, 1988) and a worldwide prevalence rate of 2% (Sasson, 1994). It is one of the most common psychiatric disorders (Rasmussen & Eisen, 1992). Sufferers have been found to have higher rates of comorbidity and suicide than those who experience other forms of anxiety (Torres et al). Distressing obsessions and compulsions preoccupy sufferers, interfering with their daily functioning, work and relationships (American Psychiatric Association, 2000). Sufferers normally view their compulsions as excessive and unreasonable and their obsessional thoughts as intrusive and alien to their sense of self. Obsessional thoughts and images generally share common themes. Sufferers may, for example, imagine themselves behaving inappropriately or violently; they may have thoughts about causing or failing to prevent fires, burglaries, infection and contamination; or they may worry about losing or displacing things. In attempting to reduce the discomfort caused by intrusive obsessions, sufferers typically engage in repeated, often time-consuming compulsive behavioural rituals or mental acts (American Psychiatric Association, 2000). These include cleaning, checking,

ordering, hoarding, counting (Rasmussen & Eisen) and confessing (Swedo, Rapoport, Leonard, Lenane & Cheslow 1989). In addition to being personally costly, the condition also has significant economic costs in terms of healthcare and lost productivity (Dupont, Rice, Shirake & Roland, 1995). The need to develop valid models and effective treatments for such a disabling and relatively prevalent condition (described as a “hidden epidemic” by Wolff, Alsobrook & Pauls, 2000) is reflected in the large body of OCD research located within a variety of academic disciplines.

Popular treatments for OCD include pharmacological treatment, behaviour therapy and more recently, cognitive therapy. Whilst all these treatments have been found to be efficacious to some degree, significant numbers do not improve (e.g. 30% of patients did not respond to either pharmacological or behavioural treatment in Foa et al's (2005) study; 33% failed to respond to cognitive treatment and 41% to behavioural treatment in research by Whittal, Thordarson & McLean, 2004). At a 2 year follow-up, 50% of patients had relapsed (Whittal, Robichaud, Thordarson & McLean, 2008). Cognitive models do not appear to have brought the same improvements in treatment efficacy in OCD (Steketee, Frost, & Wilson, 2002; Abramowitz, Taylor, & McKay, 2005) as they have in other anxiety disorders such as panic disorder (Siev & Chambless, 2007).

This, therefore, is the challenge for OCD research: “OCD treatment has reached a plateau and may require a fresh perspective to move forward” (Whittal, Robichaud, Thordarson, & McLean, 2008. p.1003). The present study proposes that new understandings of OCD and new effective treatments may potentially emerge from a biopsychosocial perspective. Gilbert (2009, p. 403) encourages the use of such a perspective for theorising and research within

mental health suggesting that: “cognitive processes cannot stand equivalent to all psychological processes” and that “...a research focus on motivation, human needs, developmental processes, social relationships and contexts is important in any comprehensive model of mental health”. This thesis suggests that current models of OCD may be usefully extended by drawing together strands of knowledge from various fields including neuroscience, psycholinguistics, social, cognitive and evolutionary psychology to form a biopsychosocial model of OCD.

Phenomenological accounts of OCD form the starting point for this biopsychosocial perspective. Rachman (1997, p.794) highlights the moral theme common to many obsessions when he suggests that OCD sufferers fear that “if other people knew about my obsessions and/or their content they would completely reject me” implying that their anxieties relate to moral accountability. A common fear in OCD of being blamed and condemned in a harsh and absolute manner was highlighted using qualitative research methodology by Ehnholt, Salkovskis and Rimes (1999). Such accounts of OCD sufferers’ fears of social rejection point to the potential value of linking OCD models with existing theories and research relating to the social psychology of ostracism and social affiliation. It is argued here that extending current biological and psychological models by incorporating “the social” into a more holistic, biopsychosocial model of OCD, may potentially offer the “fresh perspective” that has been called for by Whittal et al (2008) and this proposition forms the basis of the current study. Current models of OCD will first be considered.

## **1.2 Models of OCD**

Evidence-based models of OCD include neurobiological, behavioural and cognitive models.

### **1.2.1. The Neurobiological Model**

Understandings regarding the biological basis of OCD have to date been based on three sources of evidence: genetic evidence; neurochemical abnormalities and neuro-anatomical abnormalities (Jenike, 2001). Each of these will be considered in turn.

#### **1.2.1.1 Genetic model**

Some evidence for the genetic model of OCD vulnerability has been produced by twin studies, which have found a greater concordance of OCD in identical twins than in non-identical twins (Van Grootheest, Cath, Beekman & Boomsma, 2005). Family studies have found that the prevalence and patterning of OCD in families of OCD sufferers are consistent with a genetic mode of inheritance (Grisham, Anderson & Sachdev, 2008). However, a substantial proportion of OCD cases are “sporadic,” with no other first-degree relatives affected (Samuels, 2009), suggesting a complex relationship between environmental and genetic factors. The search for genes is complicated by the clinical complexity of OCD, and it has been suggested that certain phenotypes such as the hoarding subtype of OCD (Saxena, 2008) and tic-related OCD (Samuels et al, 2007) may have more significant genetic contributions than other types. In summary, certain subtypes of OCD may be more heritable than others, but the

genetic basis of OCD is not yet fully understood and specific genes causing OCD have not been conclusively identified (Samuels).

#### 1.2.1.2 Serotonin hypothesis

The neuro-chemical imbalance model of OCD has focused mainly on the serotonin hypothesis, which claims that symptoms of OCD are the result of under-activated serotonin pathways (e.g. Winslow & Insel, 1990). Evidence for the serotonin hypothesis of OCD mainly comes from pharmacological outcome studies (Abramowitz, 2005) which have provided some evidence that selective serotonin reuptake inhibitors (SSRIs) are more efficacious than other medications in the treatment of OCD. However, results from research on serotonin dysfunction in OCD are equivocal (Shafran, 2005). For instance, some OCD sufferers respond poorly to SSRI medication and some respond better to other forms of medication (such as atypical antipsychotics and certain benzodiazepines) suggesting that other neurotransmitters (such as dopamine) may also play a role (Jenike & Rauch, 1994). Successful treatment using SSRIs can not be taken to indicate that OCD is caused by serotonin deficiencies nor does it tell us about the mechanisms involved in its aetiology and maintenance (Salkovskis, 2002).

#### 1.2.1.3 Neuro-anatomical contributions

Specific brain structures and the communication pathways between them have also been investigated in relation to OCD. Results from functional, metabolic and structural imaging studies indicate that the orbitofrontal-striatal cortex (OFC) and connected limbic structures such as the anterior cingulate cortex (ACC) and amygdala contribute to the pathology of OCD (e.g. Graybiel & Rauch, 2000; Menzies et al, 2008). The nature of the relationship between

these observations and obsessive compulsive (OC) symptoms is unknown (Menzies et al). Nevertheless, reductions in OC symptoms following therapy have been shown to be associated with decreases in abnormal brain functioning (Saxena et al, 1999) highlighting the relevance of brain-based understandings of OCD.

#### 1.2.1.4 Critique of neurobiological models

Abramowitz (2005) has criticised neurobiological models for being “contentless” in that they offer no explanation for OCD phenomena such as obsessions and compulsions. Nor can purely biological models explain the consistency in the content of obsessions (Abramowitz); for example, intrusive thoughts of harm are invariably targeted at the defenceless rather than at the powerful (Rachman, 1997). Shafran (2005) notes that the design of existing neurobiological studies does not permit conclusions that the differences are related to the *cause* of OCD since studies are correlational rather than experimental. Although neurobiological models have not provided a full account of OCD, the findings certainly highlight the biological aspect of OCD and the importance of incorporating this dimension into a comprehensive model of OCD.

#### 1.2.2 The Behavioural model

Behavioural understandings of the acquisition and maintenance of OCD are based on Mowrer's (1960) two-stage theory of avoidance learning. This theory proposes that an anxiety-provoking unconditioned stimulus is first linked with a neutral, conditioned stimulus (i.e. intrusive thoughts) such that when an intrusive thought subsequently occurs, it is sufficient to trigger anxiety (i.e. classical conditioning). Second, after the conditioned stimulus has triggered anxiety, the individual learns (via operant conditioning) to escape, neutralise or

avoid stimuli that evoke obsessional thoughts. Negative reinforcement of such compulsions (i.e. anxiety reduction) maintains and increases these responses. Compulsions prevent the obsessions from being extinguished (Rachman & Hodgson, 1980).

A series of experimental studies demonstrated that performance of compulsive behaviours decreased anxiety associated with obsessional stimuli (Rachman & Hodgson, 1980). The exposure and response prevention (ERP) approach to treatment is based on behavioural theory, the idea being that by preventing the performance of the compulsion, the obsession is allowed to habituate. Controlled outcome studies have shown that 60-70% of clients show improvement after ERP (Jenike, 2001). However, there is a high non-compliance rate with ERP (30%) as it is very demanding of clients (e.g. Stanley & Turner, 1995).

#### 1.2.1 Critique of behavioural model

The behavioural model has been criticised on the basis that little evidence has been found to support the first stage of the model (Rachman & Wilson, 1980). In addition, behavioural theory does not explain some of the clinical phenomena that are peculiar to OCD, such as the observation that the presence of a therapist decreases obsessional anxiety and compulsive checking (Rachman, 1976). These criticisms, together with the cognitive nature of obsessions, led to the consideration of cognitive components of OCD.



### 1.2.3 Cognitive models of OCD

A variety of cognitive models of OCD exist, the majority being cognitive appraisal models but they also include a cognitive deficit model. Cognitive models are considered below.

#### 1.2.3.1 The cognitive deficit model

It has been suggested that OCD may result from cognitive deficits such as memory or reality monitoring impairments, but research findings provide only weak support for global memory deficits (Abramowitz, 2005). Some studies have shown apparent deficits in memory recall in OCD (e.g. Tallis, 1997). However, Abramowitz suggests that it is most likely that anxiety and uncertainty cause OCD participants to delay or withhold recall. The most consistent finding is that compared to controls, OCD sufferers have *less confidence* in their memory, which is not a memory deficit as such but rather an appraisal error that leads sufferers to conclude that their memories are untrustworthy (Muller & Roberts, 2005). It has been suggested that compulsive checking results at least in part from such decreased memory confidence, particularly in situations where there is a perception of responsibility for mistakes (Radomsky & Rachman, 1999; Tolin et al, 2001). As perceived responsibility for the outcome of checking increases, the memory bias in favour of threat-relevant information appears to be amplified (Radomsky, Rachman & Hammond, 2001). Van den Hout and Kindt (2003a, 2003b) provide some experimental evidence that checking causes memory distrust. The evidence therefore suggests that mistaken beliefs about one's memory appear to be more relevant in understanding OCD than actual cognitive deficits. Doubts about memory could be conceptualised as a type of intrusive thought, which, like other intrusions in

OCD, has moral overtones (people may be held morally accountable for wrong judgements and for forgetting). It is only when we are absolutely certain that we have remembered correctly that we can we feel sure that we will not be held morally accountable and blamed.

#### 1.2.3.2 Overview of cognitive appraisal models of OCD

The majority of cognitive models in OCD are cognitive appraisal models that are based on a model of emotional disorders developed by Beck (1976). This model posits that distorted beliefs have a causal relationship with psychopathology. For example, beliefs about loss and failure may lead to depression (Beck; Beck & Emery, 1985). According to this model, the content of people's "automatic thoughts" (rapid appraisals of situations) reflect these underlying beliefs or "schemas". Schemas are sometimes referred to as "cognitive structures" (e.g. Meichenbaum, 1977) which develop as a result of childhood experiences. They are viewed as generalised organising frameworks or rules which are used to "classify, interpret, evaluate and assign meanings to events" (Weishaar & Beck, 1986). Schemas therefore influence individuals' perceptions of themselves, others, and the environmental information an individual attends. Examples of them are often given in declarative form such as "I am not worthy" and "The world is unfair" (Wessler, 1986, p.22). The assimilation of new experiences into existing schemas may therefore be biased in favour of these underlying assumptions. Such biases (which include over-generalizing, mind reading, catastrophizing, and jumping to conclusions) are termed "cognitive distortions" and these are viewed as the active processes that form a bridge between schemas and automatic thoughts. The model also proposes that these schemas are more activated at times of stress and low mood. Cognitive therapy is based on the idea that by

encouraging individuals to identify their thoughts, evaluate them and replace them with more realistic, rational thoughts, they can change their problematic emotions, beliefs, and behaviours.

A range of cognitive appraisal models of OCD have been developed, each emphasising a particular belief domain in its theorising and treatment focus, but each sharing in common the general principles of Beck's cognitive appraisal models. For instance, they all share the principle that obsessional problems occur "as a result of the appraisal of otherwise normal intrusive thoughts, images and impulses as highly significant or threatening." (Shafran, 2005, p.231). An international group of researchers (Obsessive Compulsive Cognitions Working Group (OCCWG), 1997) clarified the distinction between different "levels" of cognition in cognitive models of OCD, namely intrusions, appraisals and assumptions. Intrusions are unwanted thoughts; appraisals refer to "misinterpretations" or "faulty" meanings that are assigned to specific intrusions (similar to Beck's (1976) automatic thoughts); whilst assumptions are enduring beliefs (similar to Beck's "schemas") that are "pan-situational rather than specific to a particular event" (OCCWG, p. 670). These "levels" of cognition and meaning-making interact and influence each other (OCCWG) in a linear fashion.

The OCCWG (1997) identified six cognitive belief domains upon which the various cognitive appraisal models of OCD have been based. These are:

- 1 *over-estimation of threat*: the tendency to believe that certain benign situations, sensations and mental events are dangerous (e.g. Carr, 1974 and Mcfall & Wollersheim, 1979);

- 2 *inflated responsibility*: the belief that one has pivotal responsibility for preventing harm (e.g. Salkovskis, 1985);
- 3 *perfectionism*: beliefs about the necessity (and possibility) of doing something perfectly (OCCWG, 2001, 2003, 2005);
- 4 *intolerance of uncertainty*: beliefs that uncertainty is dangerous and cannot be tolerated (Rachman, 2000a, 2000b);
- 5 *importance of controlling ones thoughts*: beliefs that thoughts can and must be controlled (e.g. Purdon & Clark, 1999);
- 6 *over-importance of thoughts*: beliefs about the significance of thoughts (that is, believing that thoughts can be harmful) (e.g. Rachman, 1997, 1998).

Evidence that these six belief domains are relevant to OCD is considered below:

#### 1.2.3.3 Overestimation of threat.

- *Introduction*

The overestimation of threat hypothesis posits that obsessional problems occur when sufferers exaggerate the probability or severity of harm (Carr, 1974; OCCWG, 2001). A more complex version of this belief domain posits that an inflated appraisal of danger combines with a secondary appraisal in which individuals underestimate their ability to cope with the perceived danger (McFall & Wollersheim, 1979, Guidano & Liotti, 1983).

- *Critique of the hypothesis*

In support of the danger-expectancies hypothesis, Frost, Steketee, Cohn and Griess (1994) demonstrated that individuals high in OC symptoms were more risk averse than a control group. Jones and Menzies (1997a) found that, consistent with this hypothesis, danger expectancy (in comparison with perfectionism, anticipated anxiety and self-efficacy) was the most likely mediator of washing behaviours in OCD sufferers. A further experimental study, which involved manipulating the perceived level of danger in two groups of OCD sufferers, found some evidence that higher perceived danger was related to increased urges to wash (Jones & Menzies, 1998a). Subsequently, Jones and Menzies (1998b) found that a treatment package for OCD washers that targets danger-related cognitions produced significant results in terms of reducing symptoms (but this was not maintained at follow up). Evidence that perceived danger is also a function of decreased prediction of ability to cope was produced by Steketee, Frost and Cohen (1998) who found that OCD patients' estimations of their ability to cope with OCD-related negative occurrences was significantly less than anxious and non-anxious controls.

Some evidence calls into question the specificity and utility of models based on this hypothesis. For instance, there is evidence that overestimations of threat are not OCD specific but rather are also correlated with other anxiety disorders (OCCWG, 2003). Whilst Woods, Frost and Steketee (2002) found evidence supporting the notion that OC symptoms negatively correlate with predicted coping ability in clinical and student samples, severity and probability predictions on the other hand had less consistent predictive value across the two groups. Moritz and Jelinek (2009) and Moritz and Pohl (2009) found no

evidence that OCD sufferers overestimate the probability of negative or OCD-related events but they did perceive themselves to be significantly more vulnerable than non-sufferers.

#### 1.2.3.4 Inflated responsibility

- *Introduction*

Inflated responsibility in this context refers to the belief that one has “pivotal responsibility” for preventing “subjectively crucial negative outcomes in the real world or at a moral level” (OCCWG, 2001, p. 1003) which may result from actions and failures to act (OCCWG, 1997). Whilst intrusive thoughts are common to nearly everyone (e.g. Rachman & de Silva, 1978), Salkovskis (1985) suggests that OCD sufferers alone appraise such thoughts as indicating that they have pivotal responsibility for harmful outcomes. Such outcomes are seen by OCD sufferers as essential to prevent (Frost & Steketee, 2002). The perceived outcomes may be actual, that is, having consequences in the real world and/or at a moral level (Salkovskis & Forrester, 2002). OCD sufferers are viewed as having the same motivations (to prevent harm) as others but are excessively concerned about them and “trying too hard” to ensure they are not responsible for harm (Shafran, 2005, p. 233). Appraisals of inflated responsibility are argued to have various consequences such as discomfort, increased accessibility and salience of intrusions, increased attention to environmental triggers, and behavioural responses which aim to reduce the sense of responsibility (Shafran). Such behavioural responses include avoidance, neutralisation, compulsions, reassurance seeking and thought suppression (Salkovskis; Salkovskis & McGuire, 2003).

- *Critique of the hypothesis*

Consistent with this hypothesis, self-report measures of responsibility appraisals correlate with measures of OC symptoms (OCCWG, 2001; 2003; Salkovskis et al, 2000; Wilson & Chambless, 1999). Since correlation can not be taken to imply causation (Salkovskis & McGuire, 2003) experimental studies have attempted to address this issue by manipulating levels of perceived responsibility in groups of OCD sufferers and non- sufferers (Arntz, Voncken & Goosen, 2007; Ladouceur et al, 1995; Lopatka & Rachman, 1995). Increased responsibility differentially impacted on OCD sufferers in that they alone responded to increases and decreases in responsibility levels with corresponding significant increases and decreases in OC experiences and behaviours (such as checking behaviours). Findings supporting the responsibility hypothesis were also obtained when responsibility was manipulated by the presence/ absence of a trusted other person (Shafran, 1997) resulting in decreases/increases (respectively) of OC behaviours in OCD sufferers. A questionnaire study demonstrated that people with OCD are not just concerned about taking wrong action but are also more sensitive to “errors of omission” (errors caused by failures to act) compared to anxious and non-anxious controls (Wroe & Salkovskis, 2000). This supports the notion that OCD sufferers assume responsibility in an increased range of situations compared to non-sufferers.

Responsibility appraisals have not been consistently identified as having discriminant validity in relation to OCD (e.g. Sica et al, 2004; Tolin, Worhunsky & Maltby, 2006). Menzies, Harris, Cumming and Einstein (2000) have argued that experiments that manipulate responsibility also inadvertently change

danger estimations, thus confounding conclusions about the causal role of responsibility in OCD. Pleva and Wade (2006) posit that perfectionism partially mediates the relationship between responsibility attitudes and OCD. Metacognitive beliefs (beliefs about thinking) have also been shown to have a mediating effect on the link between responsibility appraisals and OC symptoms (Gwilliam, Wells & Cartwright-Hatton, 2004; Myers & Wells, 2005). Such inconsistency has highlighted the complexity of interactions that link different belief domains including responsibility beliefs (Lind & Boschen, 2009).

#### 1.2.3.5 Perfectionism

- *Introduction*

Perfectionism is defined as the tendency to believe “there is a perfect solution to every problem, that doing something perfectly (i.e. mistake free) is not only possible, but also necessary, and that even minor mistakes will have serious consequences” (OCCWG, 2001, p.1004). In fact, 40% of OCD sufferers report subjective discomfort/distress as the only consequence of not completing their compulsions (Tolin, Abramowitz, Kozak & Foa, 2001). Subjective discomfort associated with perfectionism has been described as a feeling of “just not right” (Leckman, Walker, Goodman, Pauls, & Cohen, 1994). OCD sufferers describe performing compulsions until a “just right” feeling is achieved (Leckman et al).

Perfectionism is commonly measured as a multi-dimensional construct (Frost, Marten, Lahart & Rosenblate, 1990; Hewitt & Flett, 1991). Some dimensions have been argued to belong to the non-pathological concept of “conscientiousness” (Flett & Hewitt, 2006) whilst others (e.g. Concern over Mistakes, Frost et al,) may be at the core of the maladaptive aspect of perfectionism (Shafran, Cooper & Fairburn, 2002). For instance, Suzuki (2005)



found that of the perfectionism dimensions measured, only Concern over Mistakes was a significant predictor of OC symptoms and similarly Sassaroli et al (2008) found that Concern Over Mistakes accounted for most of the variance in scores on measures of OCD, eating disorders and depression.

- *Critique of the hypothesis*

Rheaume, Freeston, Dugas, Letarte and Ladouceur (1995) found that perfectionism was moderately correlated with OC symptoms in a non-clinical sample after controlling for responsibility. Similarly, Wu and Cortesi (2009) found that measures of maladaptive perfectionism had significant unique correlations with OCD beyond variance contributed by other predictors. Two studies by Coles and her colleagues (Coles, Frost, Heimberg & Rheaume, 2003; Coles, Heimberg, Frost & Steketee, 2005) produced evidence that “just not right” experiences are more related to OC symptoms than they are to other domains of psychopathology such as worry, anxiety and depression.

Whilst some studies support the idea of a unique link between perfectionism and OCD, others have contradicted this finding. Taylor, McKay and Abramowitz (2005) found that, whilst the relationship was significant, perfectionism cognitions contributed only a small amount to the overall variance in OC symptoms. Some studies have found that perfectionism does not have a unique relationship with OCD since it occurred at similarly elevated levels in anxiety disorder subgroups as compared with non-anxious controls (e.g. OCCWG, 2001, 2003, 2005; Frost & Steketee, 1997; Antony, Purdon, Huta & Swinson, 1998).

Perfectionism also overlaps with other belief domains, and it has been suggested that its impact on OC symptoms is mediated by other variables. For

example, an experimental study found that perfectionists reported more responsibility for negative outcomes than non-perfectionists (Bouchard, Rheume & Ladouceur, 1999). A correlational study found that responsibility mediated the relationship between perfectionism and OC symptoms (Yorulmaz, Koranci & Tekok-Kilic, 2006), suggesting that the contribution of perfectionism to OCD may operate in part through its influence on responsibility. More recently, Moretz and McKay (2009) found that trait anxiety fully mediated the relationship between OC symptoms (checking and “just not right” experiences) and maladaptive perfectionism.

#### 1.2.3.6 Intolerance of uncertainty

- *Introduction*

Intolerance of uncertainty has been defined as the excessive tendency of an individual to believe that the potential occurrence of negative events in the future is unacceptable, irrespective of the probability of their occurrence (Dugas, Gosselin & Ladouceur, 2001) and the belief that uncertainty is negative and should be avoided (Buhr & Dugas, 2009). It has also been suggested that it involves beliefs about “...the difficulty of functioning adequately in ambiguous situations” (OCCWG, 2001, p. 1004), for which reason OCD has been termed “the doubting disease” (Ciarrocchi, 1995). In OCD, the suggestion is that compulsive checking relates to the need to achieve absolute certainty that a perceived threat has been adequately reduced or eliminated (Rachman, 2002a; 2002b). A specific dysfunctional schema underlying OCD which relates to inflexibility in situations of uncertainty, newness or change has been suggested by Sookman, Pinard and Beauchemin (1994) and Sookman, Pinard and Beck (2001). Beliefs about the unacceptability of uncertainty are hypothesised to

lead to avoidance and checking behaviours. Interestingly, checking behaviours have been found to decrease memory certainty and hence may be a counter-productive strategy which intensifies uncertainty experiences (van den Hout & Kindt, 2003a; 2003b).

- *Critique of the hypothesis*

Some research has supported the link between intolerance of uncertainty and OCD symptoms. For example, Steketee, Frost and Cohen (1998) found that beliefs about certainty were more predictive of OCD symptoms than other belief domains measured. Tolin, Abramowitz, Brigidi and Foa (2003) found that OCD sufferers who have predominantly checking symptoms demonstrate greater intolerance of uncertainty than non-checking OCD sufferers and non-anxious controls. The latter two groups did not significantly differ from each other. Another study found that the intolerance of uncertainty subscale of the Obsessive Beliefs Questionnaire was strongly correlated with other OCD measures (OCCWG, 2001).

However, a further study by the OCCWG found that the intolerance of uncertainty subscale did not distinguish anxious controls from the OCD group (OCCWG, 2003), suggesting this belief domain may not be specific to OCD. Intolerance of uncertainty has been argued to be a feature of other disorders, such as generalised anxiety disorder (e.g. Buhr & Dugas 2009). Holoway, Heimberg and Coles (2006) demonstrated that OCD sufferers and people with generalised anxiety disorder did not differ significantly from each other on intolerance of uncertainty though they did significantly differ from controls.

### 1.2.3.7 Importance of controlling one's thoughts

- *Introduction*

This belief domain is defined as the “overvaluation of the importance of exerting complete control over intrusive thoughts, images, and impulses, and the belief that this is both possible and desirable” (OCCWG, 2001, p. 1003). Examples of beliefs in this domain are “having intrusive thoughts means I am out of control” and “if I don’t control my unwanted thoughts, something bad is bound to happen” (OCCWG, p. 1003). It is argued that such beliefs result in preoccupation with intrusive thoughts and active attempts to control them (Purdon & Clark, 2002). Some research has suggested that the act of suppressing thoughts produces a rebound effect, paradoxically increasing their frequency (e.g. Wegner, Schneider, Carter & White, 1987). The resulting failure to suppress thoughts is argued to cause distress for those who hold beliefs about the importance of controlling thoughts (Purdon & Clark). Such distress is argued to arise both from the unacceptability of the content of the intrusion to the individual (for instance because its content has catastrophic personal significance for the individual; Rachman, 1997,1998) and because the individual’s beliefs mean that his/her positive self-identity has a high stake in the notion that one ought to be able to control thoughts (Tolin, Abramowitz, Hamlin, Foa & Synodi, 2002). Wells (e.g. Wells & Mathews, 1994; Wells, 1997) posits a theory of “metacognition” that suggests OC symptoms relate fundamentally to the sufferer’s dysfunctional beliefs about the nature and meaning of thoughts (e.g. that they can be controlled).

- *Critique of the hypothesis*

In support of this hypothesis, a strong correlation between beliefs about the importance of controlling thoughts and OC symptoms has been found (OCCWG, 2001, 2003, 2005). This association appears to be specific to OCD since this belief domain is endorsed more by people with OCD than anxious controls (OCCWG, 2001, 2003, 2005). Research has also found that OCD sufferers appraise negative intrusions as less controllable, more distressing and less acceptable than non-clinical controls (Calamari & Janeck, 1998), and that people with OCD are more likely to make negative internal attributions regarding failure to suppress a neutral thought (e.g. I am mentally weak) than non-anxious controls (Tolin, Abramowitz, Hamlin, Foa & Synodi, 2002). A study by Abramowitz, Whiteside, Kalsy and Tolin (2003) demonstrated that patients with OCD used maladaptive thought control strategies such as worry and punishment more often than did non-clinical individuals and those with other anxiety disorders. Abramowitz et al concluded that the use of thought control strategies such as worry and self-punishment contributes to the maintenance of OCD symptoms because such strategies preserve mistaken interpretations of intrusive thoughts and evoke increased attempts to suppress the thoughts.

There is equivocal evidence for the theory that attempted suppression of intrusions leads to a paradoxical “rebound effect” of increased intrusions. For instance, studies have found no evidence for an increase in obsessional thoughts as a result of thought suppression in non-clinical individuals (Purdon & Clark, 2001) and in OCD sufferers (Janeck & Calamari, 1999). Purdon and Clark did, however, find that attempts to suppress were associated with increased distress. Purdon and Clark highlight the impossibility of a task that

has an instruction to *not think* of something, contradicting the notion that it is possible which is implicit in the instruction. They therefore highlight the sense of moral failure and lowered self-efficacy that may result when one attempts to comply with such an instruction. However, models of OCD that highlight sufferer's beliefs about thoughts and their desire to control thoughts (such as Wells' (1997) metacognitive theory of OCD) do not fully explain why such a belief develops or what might give the belief such power and authority in the mind of an OCD sufferer that it can not be easily abandoned.

#### 1.2.3.8 Over-importance of thoughts

- *Introduction*

Over-importance of thoughts has been defined as the belief that “the mere presence of a thought indicates it is important” (OCCWG, 2001, p. 1003). For example, “having bad thoughts means I am likely to act on them” and “if an intrusive thought pops into my mind, it must be important” (OCCWG, 2001). It has been suggested that such beliefs may reflect “thought action fusion” and magical thinking (OCCWG, 2001). “Thought-action-fusion” (TAF) was originally defined by Rachman (1993) as the tendency of an individual to assign special or exaggerated importance to thoughts and to believe that thoughts and actions are inextricably linked. Moral TAF is the belief that unacceptable thoughts are morally equivalent to overt unacceptable actions whilst Likelihood TAF refers to the belief that certain thoughts cause particular events, or at least increase the likelihood of such events occurring (Shafran, Thordarson & Rachman, 1996). Berle and Starcevic (2005) suggest that Moral TAF and Likelihood TAF are distinct but linked constructs.

In OCD, magical thinking refers to the belief that certain thoughts or behaviours exert a causal influence over outcomes (Evans, Milanak, Medeiros, & Ross, 2002) in ways that defy culturally accepted laws of causality (Einstein & Menzies, 2004a). It has been suggested that TAF and superstition may be derivatives of magical thinking (Einstein & Menzies, 2004b). Berle and Starcevic (2005) suggest that Likelihood TAF in particular may be a specific type of magical thinking given that thoughts are assumed to cause external events or increase the probability of their occurrence. Moral TAF on the other hand, does not involve illogical inference of causality but instead an excessive sense of the personal relevance attached to the thought. Berle and Starcevic suggest that Likelihood TAF relates more to preventing harm than Moral TAF since in Moral TAF there is no harm to prevent other than harm to one's self concept. Shafran (2005) amongst others (e.g. Amir, Freshman, Ramsey, Neary & Brigidi, 2001) suggests that TAF and responsibility beliefs are linked, TAF measures showing a moderate association with responsibility measures.

- *Critique of the hypothesis*

In their review of TAF, Berle and Starcevic (2005) report that there is a small but robust association between TAF and OCD suggesting that TAF may play a role in the disorder. The association appears to be stronger with obsessional (as opposed to compulsive) symptoms, particularly Likelihood TAF (e.g., Rassin, Diepstraten, Merckelbach, & Muris, 2001a; Rassin, Merckelbach, Muris, & Schmidt, 2001b; Shafran et al., 1996). A small but significant correlation between Moral TAF and obsessive features has also been found (Coles, Mennin & Heimberg, 2001). In an experimental manipulation of TAF in which an innocuous thought was linked to an apparently “threatening” consequence,

Rassin, Merckelbach, Muris and Spaan (1999) found that after the experimental procedure was completed, participants reported increases in discomfort, number of intrusions and resistance to the originally innocuous thought. Regarding the posited link between TAF and responsibility, moderate correlations have been found between measures of these two constructs (e.g. Gwilliam, Wells & Cartwright, 2004, Yorulmaz et al, 2004).

However, some researchers have recently reported that TAF is not specific to patients with OCD, and instead may be characteristic of anxiety disorders in general (e.g. Abramowitz, Whiteside, Lynam, & Kalsy, 2003c; OCCWG, 2003). Berle and Starcevic (2005) suggest that whilst TAF plays a role in OCD it does not appear to be crucial in all forms and it is not necessarily specific to OCD. They suggest that TAF has a “modest to moderate” relationship with other anxiety disorders and depression (p.280). Berle and Starcevic also reflect that there are conceptual aspects of TAF that remain unclear and conclude that conceptual difficulties and contradictory results hinder investigations within this belief domain.

#### 1.2.3.9 Some general difficulties with cognitive appraisal models of OCD

##### 1.2.3.9.1 High correlations between belief domains

Although cognitive appraisal models of OCD are argued to be amongst the most promising theoretical explanations of OCD (Taylor et al, 2006), various difficulties exist. In the commentary above, conflicting evidence regarding the mediation of belief domains by other belief domains has been highlighted. Taken as a whole, the belief domains are strongly correlated, which suggests that each domain may not be as distinct a cognitive construct as currently



theorised (Clark, 2004). For example, the OCCWG (2001, 2003) found the belief domains measured by the OBQ-87 highly correlated with each other. Woods, Tolin & Abramowitz (2004) found the rationally derived 6 factor model fit OBQ data poorly. The OCCWG (2005) later performed an exploratory factor analysis on the OBQ-87 in which three factors emerged: 1) responsibility/ threat estimation; 2) perfectionism/ intolerance of uncertainty and 3) importance/ control of thoughts. However, the three subscales were still moderately correlated in an OCD sample and had higher correlations in a combined anxious, community and student control sample (OCCWG, 2005). When Wu and Carter (2008) performed an exploratory and confirmatory factor analyses on the OBQ-87 they found a 3 factor solution, but the factors had some different item loadings than those of the OCCWG. Inconsistent item loadings, high correlations between domains and factor analysis evidence, all point to the existence of an, as yet unidentified factor in OCD. In this case, it is possible that relevant factors may be confounded or ignored in current measures.

#### 1.2.3.9.2 Lack of improved therapy outcomes

Another difficulty arises from the cognitive appraisal model's assertion that modifying faulty appraisals and beliefs will lead to a reduction in symptoms (Clark, 2005). There is evidence that cognitive therapy for OCD is no more effective than behaviour therapy alone (National Institute for Clinical Excellence, 2005). Superiority of cognitive approaches compared to the behavioural approaches has not been clearly demonstrated (Abramowitz, Taylor, & McKay, 2005). Fisher and Wells (2005) re-analysed recent OCD outcome trials using standardized criteria for improvement and recovery and similarly found that cognitive and behavioural approaches produced similar recovery rates with low numbers of patients asymptomatic after the two forms of treatment (16% of

patients asymptomatic after cognitive therapy and 21% after behavioural treatment). It has been suggested that one potential reason for the low recovery rate in cognitive therapy is that the specific beliefs integral to the maintenance and development of OCD have not been identified and are therefore not targeted in treatment (Taylor et al., 2006).

#### 1.2.3.9.3 Social threat and physical threat confounded

Theories about the evolved nature of the brain and its functions (i.e. “evolutionary psychology”) encourage an appreciation of the “prepared” (i.e. biased) nature of much information processing (DaSilva, Rachman & Seligman; 1977) and its primary function of enhancing survival in the face of the threats and opportunities in not only the physical but also the social worlds (e.g. Gilbert, 2001). Cognitive appraisal models have largely failed to explicitly differentiate these two sources of threat. The content of intrusive thoughts often includes some element of physical threat (such as thoughts about causing fires and infection, losing physical possessions, etc). Cognitive appraisal models based on overestimation of threat tend to focus on the appraisal of physical threats rather than social threat and when social threat is included in the notion of threat, it tends not to be referred to explicitly as such. For example, McFall and Wollersheim (1979) posited overestimation of threat as a mediator of the relationship between perfectionism and OCD. Examples of overestimated threats given by McFall and Wollersheim include fears of condemnation, punishment, criticism, and disapproval which may result from making mistakes. In these examples the threats that are hypothetically overestimated are *social* (as opposed to physical) threats (although this distinction remains implicit in this paper) and appear to have some relationship with a construct known as “punitive ostracism” (see Williams, 2001).

Parrish and Radomsky (2010, p.212) implicitly refer to the role of social threat when they suggest that “certain catastrophic beliefs about the potentially harmful consequences of not seeking reassurance (e.g., being held responsible for illness, injury or other harms) may be specifically related to the maintenance of ERS [excessive reassurance seeking] in OCD”. Here “being held responsible” is given as an example of a “harmful consequence”. The nature of the “harm” is not explored, but by implication may presumably involve some form of social condemnation or “punitive ostracism”.

Forms of social threat associated with OCD are the main focus of a recent review by Pace, Thwaites and Freeston (2011). Pace et al draw together fragmented findings regarding the role that criticism (and other overlapping constructs) may play in cognitive models of OCD. Phenomena that they consider overlap with the concept of criticism include hostility, blame, “demanding” or “meticulous” parenting and rejection. They do not explicitly label these as social threats. However, they do highlight the possibility that blame (rather than criticism) is actually the phenomenon of interest, which they suggest would be the case if punishment follows the OCD-relevant experience of criticism. Punishment following blame commonly involves ostracism, but punitive ostracism as a form of social threat related to punishment, condemnation and blame has not thus far been considered in the OCD literature.

#### 1.2.3.9.4 Controversies in the conceptualisation of “cognition”

The information processing paradigm on which the cognitive appraisal model is based has attracted some controversy. The issues involved in debates about cognition are complex and often philosophical in nature. However, in simple

terms, two of the concerns involved in these debates are that first, biological/affective aspects and second, social aspects of cognition may receive insufficient attention in the information processing paradigm upon which much cognitive theorising is based. One important source of criticism is the conceptualisation of cognition as “disembodied” (or “brainless”; Gilbert, 1995) and the long-running debate regarding the role of affect (e.g. Greenberg & Safran, 1984) in cognitive models of psychopathology. Another critique relates to the traditional emphasis in psychology on cognition as a *solitary* activity that “lies behind” language and linguistic expression (Edwards, 1997). In contrast to such a view, “discursive psychologists” such as Edwards conceptualise cognition and linguistic expression as inextricably linked in what is viewed as a fundamentally “social” activity that is “performative”, “constructivist” and “dialogic” (though it may also be viewed as referential and realist as well as performative; Bhaskar, 1978). These two debates (“brainless versus embodied cognition” and “semantic/referential versus dialogic/performative cognition”) are relevant to a critique of the cognitive appraisal models of OCD and to the consideration of the potential utility of a biopsychosocial model of the disorder and are considered further in 1 and 2 below.

#### 1.2.3.9.4.1 *Cognition as “brainless” versus embodied (non-conscious and affective)*

Whilst Beck’s model does not place importance on unconscious motivations and inferential processes, other models of information processing have emphasised appraisals by affective systems which are relatively independent of conscious cognitive systems (e.g. Zajonc, 1980, 1984). Such affective judgements have been described as unconscious (Leventhal, 1979; Safran & Segal, 1990), automatic, fast, inflexible (Zajonc, 1980; Power & Brewin, 1991),

and primary (Zajonc). Conscious cognitive processes, on the other hand, have been conceptualised as sequential, slow, effortful and more flexible compared to unconscious processes (Power & Brewin) and occurring at a relatively late stage of information processing (Shevrin & Dickman, 1980). Such conceptualisations emphasise linearity and lead to debates as to the primacy or otherwise of affect.

Greenberg and Safran (1984), on the other hand, argued that, rather than independent systems, affect and cognition are inevitably combined and interactive. Gilbert (2006, p.150) argues for the importance of placing cognition in an evolutionary context, suggesting that “our cognitive systems are both activating and activated by evolved [unconscious] systems”. For example, Gilbert (2001 p.18) suggests that threats are processed unconsciously using “fast-track” algorithms (e.g. “better safe than sorry”) which can result in conscious cognitive distortions such as “jumping to conclusions”. Such processing is non-logical but adaptive since unconscious processing evolved for speed and adaption, not rationality (Gilbert, 2001). Gilbert (2006) also suggests that environmental threats may activate threat processing in limbic areas such as the amygdala without the intervention of conscious thoughts, but equally conscious thoughts can activate the physiological threat-defence system in the absence of environmental threat (e.g. Gilbert 1995). That is “our cognitive systems are not physiologically neutral” but instead thoughts and images can trigger biological responses (Gilbert, 2006, p.149). Gilbert (1995) therefore encourages the use of a biopsychosocial (or “holistic”) framework to understanding psychopathology underpinned by evolutionary theory.

Lewis (2002, p.177) has suggested that from a cognitive neuroscientific perspective, disembodied, linear information-processing is an “inadequate

metaphor” for conceptualising cognition and that much cognitive theorising is limited by its use of “passive constructs” such as schema. This “passivity” (i.e. the view of schemas as enduring deep “structures” that assimilate and accommodate new information (c.f. Piaget, 1960) but not as socially “performative” or motivated as such) is contrasted by Lewis with a view of cognition that is modelled on notions such as “voice” “performance” and “social action” and as such as motivated, affective and dynamic. Referencing Thelen & Smith, 1994 and Varela, Thompson and Rosch (1991), he suggests (p.177) that “the richly distributed, reciprocally interactive and self-organizing character of neural activity” provides a biologically realistic basis for such conceptualisations of cognition. The notion of cognition as dynamic versus passive is discussed further in Section 1.3.10 below.

What is the relevance of this criticism of “disembodied” information-processing paradigms to cognitive appraisal models of OCD? Models based on beliefs about the overestimation of threat view predictions of inability to cope with negative outcomes as appraisals that are based on (distorted) rationality/logic. As Taylor, Abramowitz and McKay (2007) have pointed out, the cognitive appraisal models of OCD have been developed “...largely in a cognitive behavioural vacuum”, ignoring the literature on neurobiological aspects of OCD (p.24). The possibility that fast-track affective responses (i.e. *felt* experiences of biological threat responses and/or discomfort of varying levels of intensity in the face of certain types of negative outcomes) differentiate OCD sufferers from others is not explored in this model. Lind and Boschen (2009) refer to embodied experience when they suggest that the link between responsibility beliefs and OC symptoms comes about through the capacity of inflated responsibility beliefs to make uncertainty a more uncomfortable experience.

However, the emphasis in cognitive appraisal models is less on aversive affective experience and much more on appraisals/ beliefs/ schemas.

Similarly, the “intolerance of uncertainty” models emphasise the unacceptability of ambiguity and uncertainty to OCD sufferers, but like most of the other models, the embodied aspects of the cognition (e.g. the embodied experience of ambiguity as aversive, uncomfortable and threatening) largely remains implicit and unexplored. Cognitive neuroscientists Sachdev and Mahli (2005) suggest that certainty about decision making (judgements) can be influenced by implicit, rapid, non-conscious and associative processing as well as the analytical, explicit, processing made with deliberation that the cognitive appraisal models emphasise. They posit a role for the orbitofrontal cortex (OFC), suggesting this area produces “gut feelings” (affects based on reward history) which help to emotionally bias particular options when faced with complex or multiple choices. Where reward history involves punishment/negative feedback, choices are likely to be more affect-laden (for instance, they may produce a bodily sense of threat). They also suggest that the anterior cingulate cortex (ACC) has an “error detection” role monitoring conflicts and signalling (by threat feelings) a “need for change” strategy to avoid future repetition of judgement errors when the outcome of a decision/judgement is punishing. Sachdev and Mahli’s embodied theory suggests a possibility that OCD sufferers’ reward history (e.g. for the outcomes of one’s decisions and mistakes) has involved high levels of punishment or negative reinforcement, so that making decisions may be experienced as intrinsically aversive at a bodily level, leading to doubting and thenceforth to checking behaviours.

Cognitive appraisal models based on “over-importance of thoughts” beliefs may similarly be criticised on the basis that they conceptualise cognition as

“disembodied”. For instance, such models do not take account of the possibility (as previously discussed above) that if an intrusive cognition causes a physiological threat response and uncomfortable, aversive affect in an automatic and “fast track” way due to associative learning/conditioning without the intervention of conscious appraisal, then the individual may well understandably come to regard that intrusive cognition as salient.

Unlike the other belief domains, embodied aspects of perfectionism have received attention within the research literature. As described in 1.2.3.5., sensations described as “not just right experiences” have been linked with both perfectionism and OC symptoms. Coles, Frost, Heimberg and Rhéaume (2003) found a significant correlation between NJREs and maladaptive perfectionism in a student sample and as mentioned above also found that NJREs were more predictive of OC symptoms than symptoms of other anxiety disorders. Mancini, Gangemi, Perdighe and Marini (2008) produced experimental evidence suggesting that “trait guilt” influenced the intensity of NJREs and also found that NJREs were linked to OCD (as was trait guilt). This study therefore links an aversive bodily experience with a moral emotion (guilt) and with OC symptoms.

In Pace, Thwaites and Freeston’s (2011) review of a variety of strands of research and theory that suggest a role for criticism in OCD, the authors refer to avoidance of disapproval, desire for social acceptability and “distress” (p.15) caused by criticism. However, they do not explore literature relating to the possibility of embodied reactions to criticism/blame-related experiences (that is, social threat phenomena such as ostracism), nor to theory relating to the neuro-affective concomitants of such experiences, nor the evolutionary salience of social threat phenomena.



#### 1.2.3.9.4.2 *Conscious cognition as social (“dialogic”)*

Just as the information-processing models of cognition on which much OCD research is based may be criticised as “brainless”, the socially decontextualised (or “atomistic” e.g. Taylor, 1985, quoted in Wertsch, 2001) nature of this conceptualisation of cognition has also attracted debate. Conceptualisations of cognition in diverse fields such as neuroscience (e.g. Lewis, 2002) and discursive psychology (e.g. Potter & Wetherell, 1987), point to the centrality of “the social” in understanding human cognition. For example, there have been moves to incorporate the concepts of “social action”, “voicing” and dialogue (developed within psycholinguistics e.g. Bakhtin, 1981) into theories of language and cognition (e.g. Hermans, 1996). Such theories emphasise the socially performative (as opposed to referential) nature of language and (conscious) cognition (e.g. Potter & Edwards, 1990; Edwards, 1997).

For example, returning to the inflated responsibility models of OCD, these emphasise beliefs/ schemas which encapsulate *meanings* such as “I am responsible” and “being responsible for this outcome is unacceptable to me”. Such “passive” and “disembodied” (Lewis & Todd, 2004, p.45)) conceptualisations of cognition ignore the fact that implicit in concepts such as responsibility is a social *dynamic*. Dialogic conceptualisations of the self and cognition (e.g. Hermans, 1996) suggest a “multi-voiced” self; internal voices may potentially be blaming, blamed, accepting of blame or rejecting of blame (in the case of moral responsibility); they may also be condemning or forgiving.

The conceptualisation of cognition as “voice” and “social action” (e.g. Billig, 2001) also highlights the potential for internal “voices” (and the anticipation of such “voices”) to activate “fast-track” embodied responses similar to those

threat-defence responses activated by social interaction in the external world (such as being blamed and condemned by one's social group). For example, models based on the "importance of controlling one's thoughts" belief domain (see 1.2.3.7 above) have highlighted the tendency for OCD sufferers to attempt to control and suppress thoughts. This begs the question: why do OCD sufferers set themselves the goal of suppressing intrusive thoughts? If it is the case that OCD sufferers require themselves to suppress thoughts ("do not think of this"), then this implies that they believe it is both possible and "right" to suppress (suggestive of a moral requirement), in contrast to others who appear to believe that suppression is neither possible nor right. As discussed in 1.2.3.7, the reasons for this high stake in controlling thoughts (i.e. "I shouldn't have these thoughts" and "I should be able to control thoughts"; Purdon & Clark, 1999) have not been explained. A dialogic model of cognition emphasises not just the content of an appraisal cognitions such as "it is wrong to think these thoughts", but by conceptualising this cognition as an internal self-directed "voice", the tone of voice (e.g. cold and condemnatory) is also highlighted. If this "voice" were also to be experienced by the OCD sufferer as authoritative, then this gives rise to the possibility of "fast-track" defensive responding and difficulty in dismissing the "voice". The theoretical underpinnings of this conceptualisation together with its potential to contribute to a biopsychosocial model of OCD are discussed further in 1.3.10 below.

#### 1.2.3.9.5 Explains maintenance but not development of OCD

A further criticism of the cognitive appraisal model is that it focuses on maintaining factors (as these are invariably the target of treatment; Shafran, 2005) but does not suggest anything about the initial development of these beliefs. Salkovskis, Shafran, Rachman and Freeston (1999) have suggested

several developmental factors that may impact on an individual's beliefs about responsibility. For instance, they suggest that being given a lot of responsibility and/or being scapegoated for negative occurrences (either by parents, or at school or elsewhere) may strengthen an individual's belief about being responsible in a wide range of situations as well as increasing appraisals about potential negative consequences (e.g. being blamed) that may arise when one is responsible. Being taught strict codes of conduct, being over-protected from responsibility and actually or apparently being responsible for a harmful outcome are also identified as possible factors in the development of OCD, mediated by responsibility beliefs. Salkovskis et al suggest that the therapeutic implications of identifying such developmental factors are limited but suggest that a formulation-based approach in which background experiences are identified is desirable.

Frost, Lahart and Rosenblate (1991) found some evidence that the mothers of young women high in perfectionism had a particularly "harsh" parenting style. Similarly, Shafran and Mansell (2001) suggest that overly critical and demanding parents, excessive parental expectations, excessive parental indirect criticism and low, inconsistent and conditional parental approval may contribute to the development of perfectionism. Recently, a parenting behaviour termed "psychological control" has been identified as being linked to the development of perfectionism (e.g. Soenens, Vansteenkiste, Luyten, Duriez, and Goossens, 2005). This term refers to parenting behaviours that involve excessive use of manipulative parenting techniques such as guilt-induction, love withdrawal and verbal constraint (Barber, 1996). Psychological control is neither about overt conflict nor about manifest judgmental or neglecting parenting. Instead, it deals with covert, indirect techniques that are

communicated in a subtle, implicit fashion (Barber). This parenting style, which effectively uses the relationship as a method of control, intrudes upon children's thoughts and feelings (Barber). Results from Soenens et al's study indicate that psychological control is strongly related to adolescents' maladaptive perfectionism, although the conclusions that can be drawn are limited by the cross-sectional nature of the study.

The possible role of parental psychological control in relation to OCD has been rarely considered or investigated. However, one study that has investigated the link between three types of parenting style (parental acceptance, disciplinary firmness, and psychological control) and OC symptoms in a student sample found that psychological control was the unique predictor of OC symptoms after controlling for depressive symptoms (Aycicegi, Harris, & Dinn, 2002). Parental psychological control was also associated with a broad-spectrum of anxiety and depressive symptoms. Aycicegi et al suggested that parental reprimands and controlling statements are experienced as punishing events by children. They suggest that if children are not able to predict when the next punishing event will occur, the result may be a generally high level of anticipatory anxiety and heightened threat-sensitivity. They refer to a classic finding in animal behaviour that rats and pigeons will learn spurious associations between random events in their environment and subsequent reinforcers (Skinner, 1948). Thus, if parental punishment is largely unpredictable, children may develop a superstitious style as a coping mechanism which may help to explain the compulsive rituals observed in OCD. Although Aycicegi et al define "parental punishment" in terms of reprimands and critical statements, at the core of the concept of "psychological control" is "love withdrawal". Such guilt-eliciting withdrawal of warmth may be communicated in a subtle fashion, hence a child may

experience being blamed, condemned and ostracised by his or her parents without it necessarily being made clear to the child exactly what he or she has done to provoke such punitive ostracism.

#### 1.2.4 Conclusions of discussion of models of OCD

Evidence relating to the biological bases of OCD along with behavioural and cognitive contributions has been presented. The six belief domains on which most of the cognitive models of OCD are based have been considered. The controversies surrounding the conceptualisation of cognition as disembodied and socially decontextualised have been highlighted in the above discussions as has a move towards developing biopsychosocial models of psychopathology that emphasise the interaction of biological, cognitive and social processes. Tolin, Woods and Abramowitz (2003) suggest that it may be fruitful to combine “top–down” cognitive research (i.e., the study of conscious thoughts, beliefs, and attributions) with “bottom–up” research on non-conscious information-processing and neuropsychological processes in OCD. Gilbert (1995, 2010) has highlighted the explanatory value of evolutionary theory in explaining links between the biological, psychological and social aspects of psychopathology. Gilbert (1995) emphasizes the notion that the human brain evolved to be highly sensitive to the social domain. He suggests that once this is recognized, then the links between the social domain and neurochemistry become more obvious and important to understand. Discussion of these controversies in the conceptualisation of cognition highlights the potential usefulness of biopsychosocial models of psychopathology (with their emphasis on social context and social processes) as opposed to purely cognitive or biological models.

### **1.3 Towards a biopsychosocial model of OCD**

A biopsychosocial model of OCD underpinned by evolutionary theory that incorporates the social domain (for instance, the notion of social threat) along with biological and psychological findings has not yet been fully explicated in the literature. Such a biopsychosocial framework may potentially help to extend and illuminate current theoretical models of OCD and draw together fragmented OCD-related findings in different academic domains. The discussion below outlines the elements of evolutionary theory that underpin this new biopsychosocial approach to understanding OCD.

#### **1.3.1 The evolution of the need to belong**

Affiliation, co-operation and inclusion in social groups are regarded as having been key to our survival as a species, so a strong motivation towards social inclusion is adaptive (Macdonald & Leary, 2005). Ostracised from their group, social mammals lack resources to secure their own food, protect themselves and to gain mates and the social sustenance they need (Lancaster, 1986) and are likely to suffer an early death (Williams & Zadro, 2005). Such evolutionary pressures also applied to early humans (Williams, Forgas, von Hippel & Zadro, 2005). MacDonald and Leary (2005) suggest that as humans developed increasingly complex cooperative social structures, their levels of interdependence also increased, making inclusion crucial for survival across the lifespan. They suggest that this increasing interdependence would have been accompanied by new cues of exclusion threat, such as averted eye gaze and by appropriate alerting and response mechanisms. Gilbert (2010) suggests that social threats that are particularly arousing are those that have some

evolutionary meaning. In the same vein, MacDonald and Leary suggest that because social exclusion has been such an important threat to survival, exclusion cues have the potential to be processed automatically as a basic and severe threat to existence (similar to other primitive, “prepared” threats such as snakes or spiders). Similarly, Panskepp (1998) has argued for an innate motivational system for navigating our needs to be affiliated with others.

### 1.3.2 Affiliation and cooperation

Underpinning theories about the evolution of affiliation and co-operation in humans is the concept of reciprocal altruism (Trivers, 1971). Trivers suggested that altruism (defined as an act of helping someone that incurs some cost), particularly, though not exclusively, altruism towards non-kin, may have evolved because of the potential for the altruistic act to be reciprocated at a later time. The altruist is in a vulnerable position because cheating (non-reciprocation) may occur. Trivers argued that this vulnerability set up a selection pressure for a protective mechanism, namely moralistic aggression, which is designed to inhibit further altruism towards the cheater, to bring pressure to bear on the cheater to reciprocate, or ultimately to get rid of the cheater, for instance by ostracising him or her. Trivers suggests that reciprocal altruism requires great sensitivity towards the costs and benefits of altruistic acts. He suggests that the concept may also explain the evolution of guilt, which is an emotion that motivates the individual to repair misdeeds and to behave reciprocally in future. Sympathy and gratitude may also have evolved to regulate the altruistic system as may the ability to cheat in subtle ways by mimicking the emotions involved in reciprocal altruism (Trivers). For instance, the expression of sham moralistic aggression when no real cheating has occurred may induce reparative altruism in others (Trivers). In turn, evolution has favoured the selection of cheater-

detection abilities such as detecting and countering sham moralistic aggression (Trivers). The concept of psychological control (Barber, 1996), which involves manipulative guilt induction and love withdrawal/ostracism, could be argued to be an example of such sham moralistic aggression. Trivers suggests that cognitive abilities required to deal with such complexity may explain the rapid increase in hominid brain size during the Pleistocene. Byrne and Whiten (1988) used the term “Machiavellian intelligence” to describe the proposition that the human neocortex evolved primarily to deal with social complexity, tactical deception and detection of manipulation (as opposed to sensory or technical competence). The “social brain hypothesis” encompasses both this view and the view that the functions of empathy and co-operation were also important in triggering this evolutionary development (Barton & Dunbar, 1997). Evidence for this theory includes evidence from field studies such as the finding that brain size correlates with social group size/complexity in primates (e.g. Dunbar, 1992) and with frequency of tactical deception in primates (Byrne & Corp, 2004). Neuroscience evidence for brain specializations for processing social information (such as “mirror neurones”) has also been produced (Dunbar & Shultz, 2007).

### 1.3.3. Group cohesion, moral codes and ostracism

Extending the idea of reciprocal altruism to “prosocial behaviour” (cooperation) in human groups, Krebs (2008) discusses the significance of strategic social interactions among members of groups. He suggests that prosocial behaviour is motivated by affective experiences including disgust, guilt, shame, gratitude, forgiveness, contrition, sympathy, and empathy, and emphasises that such feelings have neurological and chemical bases. Krebs argues that possessing theory of mind abilities enables individuals to attempt to maximize their gains



from group living by inducing members of their group to behave in ways that enhance their inclusive fitness. Tactics that may induce altruism in others include begging; administering rewards and punishments; issuing threats; and signalling approval and disapproval through facial expressions and other signals that convey respect, gratitude, anger, disgust, and so on. Like Trivers, he acknowledges that the potential for individuals to “cheat” with regard to reciprocal altruism must be countered with antidotes to exploitation. One specific antidote is argued to be ostracism. Krebs posits that “there is no question that dispositions to administer such punishments have evolved in the human species” (p. 159). Similarly, Gruter & Masters (1986) suggest that ostracism is used to maintain order, to punish deviance [from moral codes], and to increase social cohesion and is likely to have physiological substrates or biological functions. Because ostracism from the group is such a serious threat, the ability to detect and respond to “the slightest hint of social exclusion” (Williams, Forgas, Hippiel & Zadro, 2005 p.2) has been essential for humans.

#### 1.3.4. The role of social emotions

As described above, for humans, social cohesion and acceptance within one’s group requires awareness of moral codes and motivation to adhere to them. Both shame and guilt have been highlighted as important “social emotions” acting as a “social barometer” providing immediate feedback on our social and moral acceptability (Tangney, Stuewig & Mashek (2007) p.347). Tangney et al suggest that these two emotions differ in their focus: in shame-inducing situations, one’s focus is on others’ evaluations of the self; whilst in guilt-inducing situations, one is more concerned about the effect of one’s behaviour on others. Research consistently shows that shame and guilt lead to contrasting motivations or “action tendencies” (Tangney et al). These authors

suggest that whilst *shame* triggers neurochemical changes that are associated with deference, defensiveness, self-concealment, interpersonal separation and distance, *guilt* on the other hand corresponds with reparative actions including confessions, apologies, and undoing the consequences of the behaviour. There is some correspondence between these actions and OCD compulsions such as confessing and decontamination rituals (Swedo, Rapoport, Leonard, Lenane & Cheslow (1989).

It has been suggested that shame and guilt have evolved as a result of two different forms of evolutionary pressure. The evolutionary root of shame is thought to be a self-focused, social threat system related to competitive behaviour and the need to prove oneself valued by and desirable to others (Gilbert, 1989). Guilt, however, is suggested to have evolved from an affiliative, other-focused system related to the need to be connected and accepted (Gilbert, 1998a; Tangney & Dearing, 2002). Shame enables the individual to detect and cope with the threats inherent in competitive/power relationships since this painful emotion motivates adaptive defensive responses such as social comparison, flight, concealment, submission and appeasement in situations in which the presence of more dominant others makes competing undesirable and risky (Gilbert, 2003). Guilt, on the other hand is argued to be rooted in an affiliative, reciprocal altruism system in which concern with reciprocity and the welfare of others is adaptive. Whilst failure to hold one's own in competition threatens the individual with decreased social power, failure to conform to the moral rules dictated by the particular society to which an individual is affiliated may result in ostracism (e.g., Williams, 2001). This implies two forms of social threat; loss of rank and loss of belonging.

The importance of these two basic adaptive evolved drives (maintaining rank and maintaining belonging/acceptance) is reflected in Leary's (1957) "Interpersonal Circle" model which suggests that basic biological drives interact with interpersonal experiences to create a personality. The two basic drives are "control" (submission-dominance) and "affiliation" (love-hate). In a similar vein, Fiske, Cuddy and Glick (2005) and Abele, Cuddy, Judd and Yzerbyt (2008) suggest that there are two fundamental content dimensions to social judgements: "warmth" and "competence". They suggest that warmth is linked to morality, affiliation, social acceptance and reciprocity, and posit that this dimension is primary, since it is "clearly critical to survival". They suggest that the competence dimension is linked to skills, achievement and status.

Social mentalities theory (Gilbert, 1989, 1992, 2000) is derived from the idea that we are biologically predisposed to attain certain biosocial goals associated with evolutionary "fitness". Co-assemblies of attentional, motivational, emotional and biological systems steer us towards goals including affiliation and social rank. Gilbert argues that the ranking mentality is activated by issues of power, competition and social control and suggests that it is particularly linked to depression and shame. Psychological phenomena, such as the need to belong to a group, responsibility and guilt, can be viewed as relating to the "affiliative" or "co-operative" mentality which has strong connections with reciprocal altruism (Krebs, 2008). The link between responsibility and OCD has been previously discussed. State and trait guilt has been shown to be significantly higher in OCD sufferers than in normal controls (Shafran, Watkins & Charman, 1996). Obsessions in OCD have in common their moral theme, OCD sufferers viewing their content as "horrific, repugnant, threatening, dangerous or all of these" (Rachman, 1997, p.794). This focus on moral

evaluation of obsessions implies that there may be a link with the affiliative mentality, “which recruits ... evaluations of social situations in terms of ...sense of belonging and moral interaction” (Gilbert, 1992, p. 139).

#### 1.3.5. Social threat versus physical threat in OCD

The concept of evolved unconscious threat-defence systems that steer individuals towards biosocial goals may therefore have some relevance to understanding OCD. As previously discussed, the overestimation of threat cognitive appraisal models (e.g. Mcfall & Wollersheim, 1979) suggest that cognitions overestimating threat trigger compulsive behaviours and uncomfortable feelings. Within some of the OCD literature there is a suggestion that, because the immediate focus of the OCD sufferer's compulsions is fending off risks such as fire, burglary, contamination etc, the brain is therefore responding primarily to cognitions about *physical* threat (e.g. Szechtman & Woody 2004). In its identification of “distorted” cognitions relating to moral concerns (such as the inflated responsibility model), some cognitive research has highlighted the involvement of *social* threat in OCD though it has generally not been labelled as such. Salkovskis (1985) proposed that OCD sufferers (in contrast to other anxiety sufferers) focus more on physical harm coming to others rather to themselves. When individuals are asked “What makes the threat so unacceptable?” the answer given tends to relate to a fear of being held responsible (Van Oppen & Arntz, 1994, p. 84). In addition, they characteristically fear that, as a result of such physical harm, they will be *blamed* and they imagine such blaming would be particularly *harsh and absolute* (Ehnholt, Salkovskis & Rimes, 1999) suggestive of issues of condemnation and ostracism (i.e. an affiliative threat as defined above). McFall and Wollersheim (p.335) suggest perfectionism in OCD relates to a desire to

avoid criticism and punishment. Again, this suggested function of perfectionism suggests the involvement of social threat and points to fears of exclusion (i.e. affiliative threat).

Cognitive neuroscientists suggest that aversive affect can be unconsciously triggered by social signals due to an evolved social threat-defence system without the need for intermediate distorted cognitions. For example, MacDonald and Leary (2005) propose that threats to one's social connections are processed at a basic level as a severe threat to one's safety. Labelling such feelings of threat as "overestimation" and "distortion" may be to ignore the possibility that experiencing social threat as highly aversive is normal for a human being and that such a response is rooted in adaptation rather than maladaptation. Leitner and Celentana, (1997) suggest that, in trying to convince their clients that their perceptions of the world are inaccurate, irrational, and distorted, cognitive therapists may risk overlooking the reality of social threat within their clients' social context. Smail (1987) suggests that in a western culture, the healthy adult is constructed as independent and autonomous, and that this notion may encourage the view that experiencing threat to one's social connection as highly aversive may be viewed as "overestimating" threat and hence contains implicit value judgements. Certainly, the cognitive appraisal models overlook the possibility that a "fast track" non-conscious processing system may motivate defensive behaviours by producing highly aversive threatened feelings in the context of social threat.

#### 1.3.6 Physiological aspects of the affiliative threat system

McDonald and Leary (2005) suggest that the social threat-defence systems evolved by co-opting existing physical threat mechanisms such as disgust

(originally evolved to produce appropriate responses to toxins), pain and thermoregulation. Thermoregulation has been linked to social attachment and exclusion. For instance, Ijzerman and Semin (2009) suggest that social relations are “embodied” such that social closeness is associated with feeling emotionally and even physically warm, whilst, conversely, social exclusion leaves people feeling colder (Zhong & Leonardelli, 2008).

Social pain theory (Macdonald & Leary, 2005) posits that the affect component of the physical pain system provided the foundation for a physiological social threat-defence mechanism that contributes to the regulation of social behaviour. Social pain is defined by Macdonald and Leary (p. 202) as “a specific emotional reaction to the perception that one is being excluded”. Social pain is argued to be adaptive because it acts as an “alarm” system for social distance and promotes quick reactions in response to social threat by producing highly aversive affect. This notion of a social pain “alarm” is analogous to Spoor and Williams’ (2007) “ostracism detection system”. MacDonald and Leary propose the dorsal anterior cingulate cortex (dACC) is related to the social pain “alarm” system as a result of its discrepancy detection function. For instance, where the goal is social closeness, then when the discrepancy detection system detects excessive social distance, the “alarm” is triggered (in other words, subjective feelings of unpleasantness/pain). These cognitive-affective mechanisms are proposed to monitor the social environment for cues indicating disapproval, rejection and exclusion. MacDonald and Leary link this system with motivation for moral and acceptable behaviour, suggesting that quick action in response to exclusion warnings (e.g. ceasing an offending behaviour) is needed to help sustain inclusionary status. Social pain/discomfort mediated by the dACC could therefore be viewed as fundamental to steering the

individual toward affiliative behaviours and away from violation of moral rules and group norms.

Eisenberger and Lieberman (2004) also explore the notion of social pain from a neuroscientific perspective. They present evidence from animal lesion and human neuroimaging studies that physical and social pain (i.e. pain experienced upon social injury when social relationships are threatened, damaged or lost) overlap in their underlying neural circuitry. Eisenberger and Lieberman suggest that the dACC plays a key role in this overlap between physical and social pain, highlighting its role in the distressing “felt unpleasantness” (rather than the sensory) component of physical pain. Interestingly the ACC has also been identified as playing a role in OCD (e.g. Graybiel & Rauch 2000) as previously described in 1.2.1.3. In a similar vein to the theory posited by MacDonald and Leary (2005), Eisenberger and Lieberman suggest that this system acts as an alarm system that is responsible for detecting cues that might be harmful to survival, such as physical danger or social separation, and then for recruiting attention and coping resources to minimize threat. They note that because of its aversiveness, pain captures attention, disrupts ongoing behaviour, and motivates action aimed at regaining safety and mitigating painful experience.

#### 1.3.7 Ostracism and affiliative threat

The fundamental need for inclusion/belonging and the experience of ostracism as a painful and salient threat have been discussed above. Williams (1997, 2001) differentiates forms of ostracism including (amongst others) punitive ostracism. As has been discussed, punitive ostracism developed as a form of “moral aggression” that can be used to punish a “cheater” (in terms of co-

operation and reciprocity e.g. Trivers, 1971; Krebs, 2008) in order to enhance reciprocity in groups (Ouwerkerk, Kerr, Gallucci & Van Lange, 2005). Thus punitive ostracism has been associated with affiliation in contrast to “oblivious ostracism”, in which the target is ignored due to being perceived as unimportant and low ranking (Williams). Such a definition resonates with Gilbert’s (1989, 1992) concept of “social attention holding power” (SAHP) whereby evolved capacities for social control via aggression/threat have been added to and modified by the need to present the self as attractive to others and thereby worthy of attention/investment. Gilbert links loss of rank and SAHP with depression (e.g. Gilbert 1992).

#### 1.3.8 Ostracism and OCD

Affiliative threat (i.e. ostracism) and the drive towards social inclusion has rarely been explored in relation to OCD. However, there have been some suggestions that there may be a link between OCD and social acceptance/social criticism. The phenomenology of OCD includes intrusive thoughts that commonly centre on possible acts that would offend or harm people and would risk social exclusion (Boyer & Lienard, 2006, p. 604). Rachman (1977, p. 794) suggests that the content of obsessions for some individuals leads to fears such as “if other people knew about my obsessions and/or their content, they would completely reject me”. Ehntholt, Salkovskis and Rimes’ (1999) finding that OCD patients expect that if they were to cause harm to others then they would be blamed/condemned in a harsh and absolute manner, implies anxiety about being ostracised. The content of obsessions in OCD often relates to fears about moral transgressions; it is a widely recognised phenomenon that within social groups, transgression of moral rules may result in ostracism (e.g. Haidt, 2003 p.858).



### 1.3.9 Self-to-other relating, social Information processing, internal working models and OCD

The discussion above highlights the social nature of the human brain, and its sensitivity and reactivity to external social signals. Building on psychoanalytic theories that were developed in the early 20<sup>th</sup> century, Fairbairn (1952) used the term “object relations” to refer to the notion that internal social representations (“objects”) are formed by the patterns that emerge through repeated experiences of the care-taking environment. Object relations theorists emphasised the gratification of hunger and libidinal drives as the key motives for relating to others. Building on and adapting this notion, Bowlby (e.g.1969) theorized that human social bonds (“attachments”) are a primary instinct rather than simply a means of satisfying basic drives. He proposed that humans have evolved to develop internal, experience-based mental representations of the self in relation to attachment figures (“Internal Working Models” (IWMs)). Studies of young children’s responses to brief separation from attachment figures (such as the “strange situation” procedure (Ainsworth, Blehar & Waters & Wall, 1978)) provided support for Bowlby’s view. More recently, support for the theory has arisen from neuro-scientific study of pre-motor mirror neurons, which Gallese (2005) argues enables primates to understand others’ actions through “embodied simulation”. It is argued that IWMs lead individuals to process social information in a biased way (Dykas & Cassidy, 2011). Variations in “social information processing” (SIP) (see Crick & Dodge 1994) are considered to play a significant role in development because they affect individuals’ social and emotional adaptation across the life span. Crick and Dodge (p.81) argue that emotion is “an integrated part of each social information processing step”. In their review of attachment and SIP, Dykas and

Cassidy suggest that one important dimension that affects how social information is processed is the extent to which the social information could cause the individual psychological pain. That is, the individual may filter out or suppress social information depending on the nature of the IWM as a means of pre-empting and defending against psychological pain. Dykas and Cassidy also suggest that IWMs generalise to the processing of information relating to peers and others in addition to primary attachment figures.

Although they do not explicitly draw on the notion of IWMs, Parrish and Radomsky's (2010) examination of "excessive reassurance seeking" in relation to OCD and depression does relate it to sufferers' habitual ways of relating to others and to a focus on threat in the social domain as well in the "general" domain. They suggest that excessive reassurance seeking occurs both in relation to "general threats" such as fire and theft but also in relation to perceived social threats such as abandonment and loss of support. These researchers contrasted the reassurance-seeking of OCD and depression sufferers, finding that whilst depression sufferers' reassurance-seeking mainly related to themes of self worth such as "Do you still love me?" (p.17), the OCD group reported a greater variety of concerns in their reassurance seeking. Whilst this often involved "general threats" such as "Are you sure the stove is off?" (p.216), it also included social threat issues such as asking for reassurance "that someone's not mad at me;" (p.216). This research implies a desire for approval and "sociotropy" (needs for social and interpersonal approval, admiration, acceptance and affiliation; Beck, 1983) in both depression and OCD, but in depression the emphasis is on approval/disapproval of the self, whilst in OCD the emphasis is on moral approval/disapproval. This is arguably along similar lines to the concept of oblivious ostracism (which implies one is

rejected for not being sufficiently worthwhile or having insufficient SAHP –see 1.3.7 above) as opposed to the concept of punitive ostracism (which implies that one is rejected as a consequence of breaking moral or social rules).

In their review of the literature on external criticism and OCD, Pace, Thwaites and Freeston (2011) have highlighted a methodological difficulty caused by inconsistent definitions of criticism, suggesting that criticism as defined within the research literature overlaps with various other constructs including hostility, punishment and blame. It is possible that the concept of punitive ostracism encapsulates all of these various constructs and it also allows for a biopsychosocial formulation of OCD. Such a holistic formulation has the advantage of making links between biological, psychological and social factors (that is, it helps us to understand *how* phenomena occur and interact), but in addition, by relating these phenomena to evolutionary theory (e.g. Barton and Dunbar, 1997), we potentially can begin to gain some understanding of why these phenomena occur. For example, research into ostracism suggests that ostracism is processed at a fundamental biological level (e.g. Eisenberger & Lieberman's (2004) neuroscientific research into the "social pain" and its relationship to rejection), which in turn suggests that thoughts, feelings, behaviours and outcomes that have learned associations with accountability, blame and ostracism may elicit feelings of threat in a "fast track" and automatic manner.

#### 1.3.10 Self-to-self relating, dialogism, self-condemnation and OCD

Since obsessions occur in the private domain of the individual's mind, it could be argued that a thought should not trigger a physiological affiliative threat system. However, models of cognition that emphasise "voice" potentially throw

light on how cognition and physiological threat systems may interact and this idea has been taken up within the discipline of cognitive neuroscience. Within cognitive neuroscience, there is a commitment to understanding the brain as the basis of cognition. As noted in 1.2.3.9.4.1 above, the distributed, reciprocally interactive and self-organizing character of neural activity provides an alternative model to the view of cognitive processing as linear sequences performed by “symbol-processing machines” (Lewis, 2002). Lewis (Lewis, 2002; Lewis & Todd, 2004) suggests “passive” disembodied cognitive constructs such as schemas (for example, self-schemas in the form of declarative beliefs such as “I am unworthy” – see p.9) may usefully be refined using a more dynamic model in which embodied voices inter-animate each other. Voicing, construed as action, points toward the brain regions and subsystems directly involved in planning and generating voluntary speech. Lewis proposes that one remains in a continuous dialogical relation with an “anticipated, almost-heard other” (Lewis & Todd, 2004, p. 49). He speculates that speech-like plans are generated in response to the anticipated “inchoate” other (i.e. at the level of gist) and more articulated inner speech activates pre-motor circuits and the motor cortex respectively. He also suggests the answering voice in this internal dialogue can be “heard” through feedback from the auditory circuits. Anticipation of “voices” forms a process of perceptual modelling and action-planning. That is, the brain is viewed as generating actions and perceiving events that fit an anticipated future just ahead in time (e.g. an anticipated “voice”). This concept of cognition as voices in active dialogue has something in common with “relational schema” as conceptualised by Baldwin (1997) who suggests that rules of self-inference derive in large part from expectancies about the contingencies of interpersonal interaction. He

suggests, for example, that changing an individual's attributional style may "require changing the person's private audience" (Baldwin, p.333). Although Young's concept of "schema modes" (Young, Klosko & Weishaar, 2003) has been criticised as lacking clear theoretical and scientific embedding (Lobbestael, van Vreeswijk & Arntz, 2007) it similarly offers some suggestion that "people have different sides of themselves; every person includes a multi-vocality of modes" (Rafaeli, Bernstein & Young, 2011). However, only dialogical theories of self explicitly draw upon psycholinguistic and discursive psychological theories of cognition as multi-voiced and "socially performative".

Lewis (2002) proposes that both the OFC and the ACC, with their close connections with the limbic system, may be involved in attending to potential rewards and threats inherent in inchoate speech and driving behavioural plans (including internal speech). Schore (1994, 1997) has also emphasized the role of the OFC as "valence-tagging" perceptions along a reward-punishment continuum. According to Schore, the right OFC produces an affectively charged gist-like sense of an interpersonal respondent based on expectancies from many past interactions (i.e. comparable to the "internal working model" originally proposed by Bowlby, 1969). Schore suggests that this gist-like image is the fundamental arbitrator of emotion regulation and it sets the rest of the brain in a mode of readiness based on preconscious expectations. The internal sense of a warm soothing parent permits rapid emotional equilibration, whereas the expectation of rejection or criticism promotes defence or withdrawal. In other words, this gist like sense of "the other" may impact on the individual's threat-defence system (which includes phenomena such as social pain, and social warmth/coldness).

Within the growing (if fragmented) literature examining the importance of “self-to-self” relating in relation to psychopathology, constructs such as self-criticism, self-blame and associated concepts such as guilt and shame have been considered. The latter two concepts (that is, guilt and shame) could potentially be used to describe elements of experience that are physiological and emotional in nature and/or consist of internal self-blaming or self-critical internal dialogues. Gilbert and Irons (2005 p. 271) have suggested: “Self-criticism can act as an internal *hostile signal*. It is like having a self-monitoring system that is constantly looking for weaknesses and condemning the self”. Gilbert and Irons (p.271) link this experience to shame, suggesting it can form the basis of “...internal harassment” which is described as “...the constant, repetitive experience of being (internally) attacked/condemned and feeling shamed”. Gilbert and Irons (p.271) suggest the impact of such shame-provoking self-to-self relating is similar to the impact of a subordinated animal being harassed by a dominant animal. They also suggest such self-to-self relating (that is, self-criticism) is linked to what the social rank mentality (Gilbert, 2000 – see 1.3.4 above) which is viewed as “rooted in role-forming mentalities and defensive strategies” (Gilbert and Irons, 2005, p.273). In a similar vein, Gilbert (2000) links this mentality with the dominant-submissive pole of Horowitz and Vitkus’s (1986) interpersonal model and with loss of status, which in turn is based on Leary’s (1957) interpersonal circle (also mentioned in 1.3.4 above). This interpersonal circle model is derived from the notion that biological drives interact with interpersonal experience to build a “personality” that is reflected in predominant interpersonal behaviours (Benjamin, 1996). As previously discussed, in Leary’s model, interpersonal behaviours can be aligned along two basic poles for interpersonal relating, one relating to affiliation (friendliness,

love-hate) and one to control (power, status, submission-dominance) (Benjamin). In terms of Gilbert's social mentalities theory, these two poles appear to overlap with the affiliative mentality and the ranking mentality respectively. The concept of self-criticism has thus been linked with a submission-dominance or ranking internal dynamic, and also with "self-oriented perfectionism" (e.g. Shafran & Mansell, 2001) which in turn has been linked with depression in patient samples (e.g. Hewitt, & Flett, 1991). Self-criticism therefore appears to have been theoretically linked mainly to ranking/ control/ submission-dominance issues and thereby to issues such as depression and shame.

The contention of this study is that in OCD sufferers, threat-focused self-to-self relating may be mainly linked to the affiliative/ "in-group versus out-group" domain, wherein inclusion/acceptance (in the interpersonal domain) depends on establishing oneself in the minds of others as reciprocal, co-operative and moral; and wherein rejection ("punitive ostracism" / condemnation) may be used as a punishment for breaching moral rules. This is in contrast to the ranking/power/ "up-rank versus down-rank" interpersonal domain, wherein maintenance of status depends on establishing SAHP in the minds of others. It is possible that within the intra-personal domain "self-condemnation" may be particularly relevant to OCD. This study also contends that self-condemnation is linked to the experience of punitive ostracism. Punitive ostracism in a social arena (as defined by Williams, 2001) involves an act of blame for some form of perceived immoral behaviour that is signalled by personal acts of rejection (not making eye contact, not speaking, withholding friendly and warm social signals (for instance, not smiling, not offering empathy or sympathy to signs of distress etc.) as well as acts of group exclusion (which may range from excluding

someone in the group from a conversation, to excluding someone from society such as imprisonment.) As a hypothetically internalised form of punitive ostracism, it is proposed that self-condemnation involves internal experiences such as an emotional coldness and low empathy towards the self as a form of punitive reaction to some perceived form of immoral behaviour (whether that be internal or external).

Low self-forgiveness/self-condemnation may have some conceptual overlap with self-blame. Self-blame has sometimes been divided into two types: “behavioural self-blame” and “characterological self-blame”, the latter having been linked with depression (Janoff-Bulman, 1979). Behavioural self-blame has also been described as consisting of self-attributions that are internal, unstable and controllable as opposed to characterological self-blame, which is viewed as internal, stable and uncontrollable (Graham & Juvonen, 1998). Whilst the latter has been described as being linked with shame and a tendency to withdraw and give up, the former has been described as being linked with increased guilt and increased motivation to redress wrongs (Graham & Juvonen). Andrews (1998) reports that shame has been linked with characterological self-blame, and behavioural self-blame to guilt. However, the notion that shame and guilt relate exclusively to the domains of the self and of behaviour respectively has been questioned (Andrews). Guilt has been described in evolutionary terms as serving a signal function by way of “mild often unconscious anxiety” (Greenwald & Harder, 1998). To avoid feeling this discomfort, the individual is motivated to change behaviours and thoughts that might be harmful or immoral and often to attempt some form of reparative behaviour. However, whilst guilt experiences are generally conceptualised as pertaining to events that have occurred, the focus of attention in OCD is often



on events that may occur in future. Shame is also sometimes viewed as a motivator towards certain behaviours, but the focus of the behaviours is aimed at reversing the damage to one's status or good name (Lansky, 1995) rather than redressing some form of moral harm.

There is also some link between the concept of different forms of inner self-to-self relating and that of "inner working models" (IWMs), introduced in 1.3.9 above, which were described by Bowlby (1969, 1973) as internal representations of "self" and "other" that originally develop as reflections of a child's interactions with their care-giver. As previously explained, these are hypothesised to lead to conscious or tacit expectations of attitudes by others in relation to the self particularly by attachment figures but also others in the wider social context (Guidano & Liotti, 1983). IWM theory focuses on conscious and unconscious expectations of how external others will relate to the self, rather than expectation of how an internal "voice" or "part" will relate to the self. Bhar, 2004 and Bhar and Kyrios, 2000 draw on Guidano and Liotti's conceptualisation of IWMs in relation to OCD in their development of the construct "self-ambivalence". Self-ambivalence describes the degree of uncertainty in and pre-occupation with one's self-worth, which was found to be linked with OC symptoms after controlling for depression, but also with other anxiety disorders. The measure they developed for this research (the Self-Ambivalence Measure) did not have subscales to distinguish different domains of self, such as the morality domain, which Doron and Kyrios (2005) suggest may be particularly relevant to OCD, and which is arguably the domain also emphasised by the concept of self-condemnation/low self-forgiveness.

Another point of discussion regarding self-condemnation is its dialogic quality, since dialogism theory forms part of the conceptual basis for this study. The

links between OCD and responsibility have previously been discussed within the context of the traditional cognitive appraisal model. It has been highlighted that a potential criticism of this model is that it conceptualises cognition as static and non-social. Notions such as “self-criticism”, “self-forgiveness” and “self-condemnation” emphasise the idea of two “parts” in dialogue, the part that is criticising/forgiving/condemning interacts in a pseudo-social manner with the part that is criticised, forgiven or condemned. The notion of cognitions/beliefs about excessive responsibility does not in essence say anything about how such thoughts evoke anxiety. It is argued here that, implicit in the literature on responsibility beliefs is the notion of forgiveness. If one’s inner self-to-self dialogue (explicit or gist-like) is “You are responsible but I forgive you” and the tone of this self-relating is warm, attuned to one’s distress and sympathetic to it, then it seems likely that one would be less likely to dread the possibility of making a mistake compared to someone whose anticipated internal voice is cold, unsympathetic and conveys “I will never forgive you if you make a mistake”. This conceptualisation of cognition as dialogic and pseudo-social allows for the possibility that anticipation of a cold non-forgiving voice may trigger the threat-defence system, causing discomfort and conscious or unconscious anxiety. The notion of dialogism is therefore central to the biopsychosocial model of OCD proposed here.

#### **1.4 Conclusions**

Evidence for the role of biology, conditioning and cognition in OCD has been presented. Research in these fields has gone some considerable way towards improving our understanding of this condition. However, competing theories, fragmented bodies of evidence and semantic and conceptual problems all hinder our understanding of the disorder. There has been relatively less

attention paid to the role of “the social” in the development and maintenance of OCD and as yet a biopsychosocial model of OCD had not been fully formulated.

In this introduction, it has been suggested that theories and evidence from diverse areas of knowledge that have not yet been applied to OCD may contribute to a biopsychosocial model which has potential to improve our understanding of the condition. For example, areas of the brain that have been highlighted as having involvement in OCD have also been identified as having involvement in social pain, valence tagging of internal “voices” and in the inclusionary-status alarm system. Dialogism theory (wherein thinking is described as a “social” activity which may trigger the social threat system without obvious external cause) may throw light on the OCD-related phenomenon of the desire to control thoughts and importance of thoughts. That is, it suggests a mechanism whereby a predicted “gist-like” unforgiving and condemning voice may trigger a bodily experience of aversion and threat. Heightened sensitivity to ostracism, particularly punitive ostracism, provides a potential explanation for the OCD sufferer’s vigilance to moral rule breaking (i.e. issues of moral accountability). Such vigilance potentially has roots in a desire to pre-empt moral aggression and ostracism (either by others’ or by one’s own internal, anticipated, unforgiving “voice”) and this in turn may have roots in evolutionary adaptations to group living such as reciprocal altruism. The OCD sufferer may potentially have experienced frequent sham moral aggression (i.e. non-contingent punitive ostracism such as the “silent treatment”) by carers and peers. Sham moral aggression appears to be an important aspect of the construct termed “psychological control” (e.g. Barber 1996) which involves verbal constraint, blaming/ guilt induction (scapegoating) and love withdrawal/ ostracism. Psychological control is essentially manipulative such that

punishment (ostracism) and approval have inconsistent contingencies. Such a variable negative reinforcement schedule may increase behavioural attempts to preclude any possibility of moral rule breaking/ mistakes and associated ostracism/love withdrawal (i.e. perfectionism). In addition, if one has been frequently blamed (i.e. held responsible) and punished through ostracism, then it would seem very possible that one may come to develop a (pre-emptive) inflated belief about being responsible.

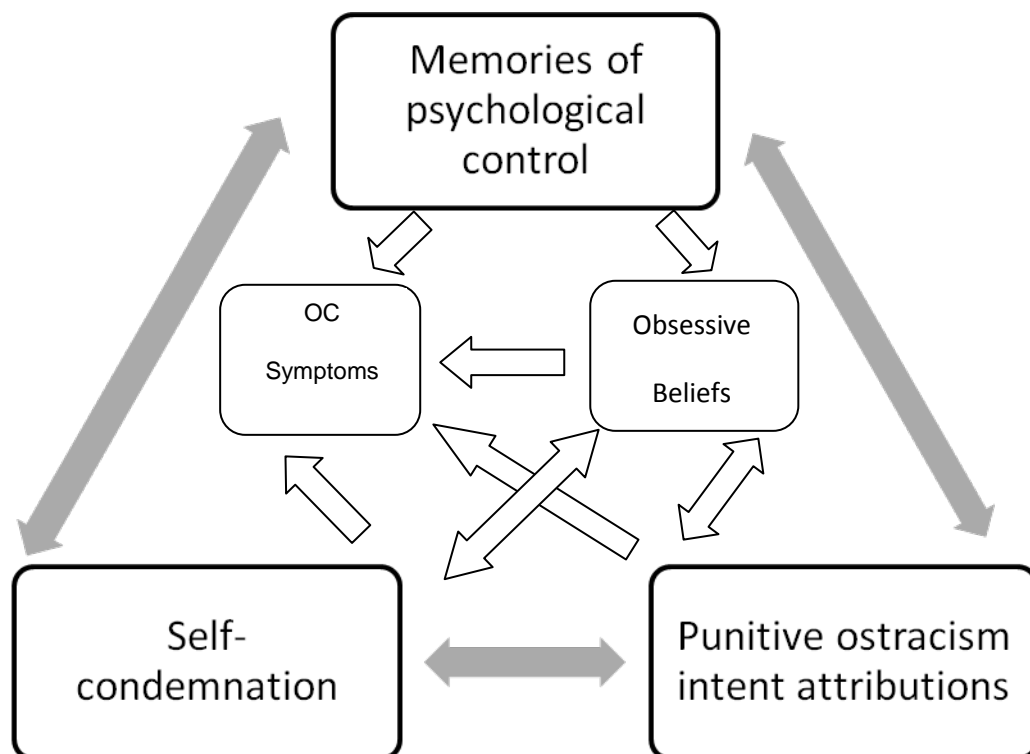
### **1.5 The current study**

The literature review has presented an argument for incorporating theories of social affiliation, ostracism, social pain, social information processing and dialogism into a biopsychosocial model of OCD. Based on this argument, the current study explores whether punitive ostracism experiences (henceforth termed POE which consists of memories, attributions and self-condemnation) explain some of the variance in the relationship between obsessive beliefs and OC symptoms. That is, POE variables are argued to covary with obsessive beliefs and to also be predictive of OC symptoms (controlling for obsessive beliefs) and thus help to explain the relationship between them. The study also pilots a new measure of ostracism intent attributions.

The three cognitive phenomena classified under the rubric POE occur on different “levels” of cognition, but are argued to reciprocally impact on each other in a causal fashion. That is, memories of punitive ostracism in childhood (viewed as (social) trauma memories) are argued to be related to a social information processing bias reflected in a threat-related “better safe than sorry” tendency to attribute punitive ostracism to ambiguous social situations.

Memories of punitive ostracism are also argued to be linked to a dialogical inner relationship that is condemning in nature and this is conceptualised as having resulted from a process of internalisation of the punitively rejecting messages received from external others (c.f. Vygotsky, 1978). An ongoing tendency to attribute ambiguous social situations as punitively rejecting may further reinforce the inner dialogical relationship between the condemned self and a distancing/condemning “other”. Threat experiences caused by such attributional bias may also lead to further laying down of social trauma/threat memories. In addition, because self-condemnation is argued to also be experienced as a (pseudo) “social threat“, experiencing inner condemnation that cannot be resisted may also cause biased attributions in external social situations and experiences of not forgiving oneself may be laid down in memory as aversive experiences.

Figure 1: Hypothetical relationships between study variables



It is suggested that the existence of an authoritarian, punitively rejecting “part” within the individual’s “internal space” (c.f. Hermans, 2001), which is reflected in a tendency to self-condemn, may motivate the individual to control thoughts (since both internal and external events may be morally condemned by an internal punitive “voice”) and to regard thoughts as an important source of moral accountability and threat. Memories of psychological control may be related to perfectionist beliefs since children who have been controlled by non-contingent punitive love/affiliation withdrawal (by parents and/or peers) may come to believe that perfection is expected by (powerful) others and therefore is possible, and that others will only accept them if they are perfect and conversely will condemn and ostracise them if they are less than perfect. Intolerance of uncertainty may also have a relationship with experiences of psychological control. That is, the uncertainties of a social milieu characterised by manipulative punitive ostracism (and its associated inconsistent and unfathomable contingencies) are likely to be highly stressful, anxiety-provoking, and difficult to tolerate for those who (particularly as relatively powerless children) have been subject to such behaviours. A bias towards experiencing others (in ambiguous situations) as holding one morally to account, blaming and condemning may help to explain a belief that one has pivotal responsibility. This “better safe than sorry” functioning (i.e. tending to over-interpret social threat) may also help to explain overestimation of threat beliefs. Also, having an internal “voice” that holds one to account, blames one and punishes one (i.e. self-condemnation) may be part of the responsibility belief phenomenon (i.e. the difference between these two variables may be mainly conceptual). The importance of identifying the potential contribution of self-condemnation in this instance is mainly clinical as it may suggest new targets for interventions.

Given the contention outlined above that the three POE variables causally impact on each other, it is argued that they will all make a significant contribution to the variance of OC symptoms and to the variance of Obsessive Beliefs. Developing beliefs (as a result of one's social threat experiences) that the world is threatening, that one is pivotally responsible, that one should (but cannot) control thoughts, that uncertainty is intolerable, that one should (but cannot) be perfect, may all reinforce the tendency to self-condemn, to over-interpret ambiguous ostracism as punitive, and to lay down further threat memories.

This study therefore hypothesises that the three POE variables significantly contribute to the variance in OC symptoms after controlling for the three factors of the Obsessive Beliefs Questionnaire-44 (OBQ-44) (Importance of Thoughts/Importance of Controlling thoughts; Perfectionism/Intolerance of Uncertainty; and Responsibility/Overestimation of Threat; OCCWG, 2005;).

It is also hypothesised that three POE variables make a significant contribution to the variance of the factors of the OBQ-44.

Confirmatory evidence in support of these hypotheses is argued to potentially provide the basis for incorporating the cognitive appraisal model into a broader biopsychosocial framework, which would provide the basis for further research. The study is also argued to be potentially clinically significant since attributional tendencies, social threat memories and condemnatory self-to-self relating could potentially be targets for clinical interventions in OCD. Such interventions may include compassion-focused approaches (e.g. Gilbert 2010) and dialogical psychotherapy (e.g. Hermans & Dimaggio, 2004).

### 1.5.1 Research Aims

The aim of the research was to first develop and pilot a new measure of intent attributions in ambiguous ostracism situations since no measure relevant to this research question previously existed. Social cognition theorists suggest there are individual differences in activation of an ostracism detection system and in social information processing (SIP) and also differences in the intent of those who ostracise others. Measuring intent attributions within hypothetical ambiguous ostracism situations is potentially one means of assessing SIP biases and degree of activation of the ostracism detection system.

The main aim was to investigate the hypothesis that three POE variables (memories, attributions and self-to-self relating) confound the relationship between obsessive beliefs and OC symptoms.

### 1.5.2 Research Questions

#### 1.5.2.1 Pilot study research questions:

- *Part One:* Can ostracism intent attributions be measured validly and reliably?
- *Part Two:* Is an adapted version of the Parental Psychological Control Scale-Youth Report (Barber, 1986) reliable over time?

#### 1.5.2.2 Main study research questions

- Do the three POE variables (memories of psychological control by parents and peers (PCSt); punitive intent attributions (SSQp) and self-condemnation (HFS)) predict Obsessive Beliefs variables (Importance of Thoughts/Importance of controlling thoughts (I/CT); Perfectionism/



Intolerance of Uncertainty (P/C); and Responsibility/Overestimation of Threat (R/T))?

- Controlling for Obsessive Beliefs variables, do POE variables significantly predict OC symptoms?
- Do POE variables significantly interact with obsessive belief variables in their impact on OC symptoms?

### 1.5.3 Hypotheses

1. POE variables will significantly predict Obsessive Beliefs (R/T; P/C and I/CT).
2. POE variables will significantly predict Obsessive Symptoms (OCI-R) controlling for Obsessive Beliefs.

## **2. Method**

### **2.1 Design**

The ontological stance of the study is based on the scientific assumptions of empiricism (regularities and causal relationships exist in the world and can become known to us through observation) and its epistemological stance is that of positivism (knowledge produced by the study is factual, objective knowledge, rooted in logic, unaffected by the researcher and generalisable). The logic of enquiry that it employs is hypothetico-deductive; that is, it is driven by hypotheses drawn from theories which the research can potentially falsify by testing the observable data. It takes into account existing theories, and extends them by incorporating knowledge from other areas. The variables used are latent and subjective in nature, but the research makes the assumption that they can be objectively, reliably and validly measured using validated, standardised measures which operationalize the variables as scores computed from the answers to questions.

The study is quantitative and the design consisted of a longitudinal test validation across two time points and a cross-sectional, correlational survey. It used a non-clinical sample of convenience of sufficient size to have appropriate statistical power and generalizability to the population. All the data were collected using online questionnaires. Survey data were analysed using correlational analyses.

Variables involved in the study are as follows (details of instruments are given in 2.6):

Criterion (dependent/outcome) variable:

- OC Symptoms measured by the OC Inventory (revised) (*OCI-R*).

Predictor (independent) variables:

- Obsessive Beliefs measured by the three factors of the Obsessive Beliefs Questionnaire (*OBQ-44*) measured by Responsibility/Threat (R/T), Perfectionism/Intolerance of Uncertainty (P/C) and Importance/Control of Thoughts (I/CT).
- Punitive Ostracism Experiences (*POE*) which consists of :
  - Self-condemnation measured by the Heartland Forgiveness Scale (HFS).
  - Memories of being psychologically controlled measured by the total score (PCSt) of three revised subscales of the Parental Psychological Control Scale-Youth Self-Report (revised): Mother's Psychological Control; Father's Psychological Control and Peers' Psychological Control.
  - Punitive Ostracism intent attributions in ambiguous ostracism situations (SSQp) measured by the new measure entitled the Social Situations Questionnaire (SSQ).

## **2.2 Data analysis**

GPower version 3.0.10 was used for power analyses. SPSS Version 17 was used for all other analyses.

## **2.3 Sample size issues**

As no previous research using this combination of variables has been carried out, assumptions about effect size based on previous studies could not be accurately made. For the Pilot Study, reliability (correlation) analyses of Time One and Time Two responses required a sample size of at least 122 to achieve 80% power with a type one error probability of  $p < .01$ . In the main study regression analyses, to achieve 80% power with a type one error probability of  $p < .05$  and potential effect sizes that are small (.02), half way between small and medium (.065) and medium (0.15), 602, 189 and 85 participants respectively are needed. The research aimed to strike a balance between a realistic sample size that could be achieved during the study and the possibility of relatively small effect sizes, and therefore aimed to achieve a sample size of at least 189. Participant responses from the Pilot Study were also included in Main Study analyses to maximise the power of the research. Post hoc power analyses were calculated and are reported in the results section.

## **2.4 Ethical considerations**

Participants were recruited from the community. Limited demographic information was collected and individuals with current or previous mental health histories were not excluded. Ethical approval was sought and received from the University of Hull. Measures were chosen that did not include questions about participants' risk, but which did contain personal questions they could potentially

have experienced as intrusive. This risk was mitigated by the fact that the study was an online survey (as opposed to face-to-face interviews). It was felt that there was a possibility that some participants may feel concerned about their mental health having completed the questionnaires and that some of the questions could potentially touch on upsetting memories for some participants. The information sheet advised participants to contact their G.P. should they have such concerns about their health and the contact details of the chief investigator, who is a qualified clinical psychologist, were also given.

## **2.5 Participants**

A community sample of convenience was used. Participant data from Time One of the Pilot study were entered into the Main study. Participants were required to be aged 18 or over; no other exclusion criteria were used.

Participants in the Pilot Study were 141 adults aged between 18 and 68 ( $M=37.85$  S.D. = 13.9). 109 were female and 29 were male. Of these 141, 109 submitted Time Two questionnaires (77.3%).

Participants in the Main Study were 330 adults aged between 18 and 68 (mean age =32.6; S.D.= 13.6). 234 (70.9%) of these were female (mean age =32.7, S.D. = 13.4). 96 (29.1%) were male (mean age =32.3; S.D.= 14.1).

## **2.6 Measures:**

- *Heartland Forgiveness Scale “HFS”* (Thompson et al 2005) (*Forgiveness of Self subscale*)

Heartland Forgiveness Scale measures three components of dispositional forgiving (forgiveness of self; forgiveness of others and forgiveness of situations). The HFS consists of 18 items, with three six-item subscales. Items

are measured on a seven-point Likert scale (1 = almost always false of me; 7=almost always true of me), with higher scores reflecting higher levels of each form of forgiveness. Only the self-forgiveness subscale was used in this study. Cronbach's alpha for this subscale was reported as .72-.75 by Thompson et al. Items include "I hold grudges against myself for negative things I've done" And "With time I am understanding of myself for mistakes I've made". In the present study, items were reverse scored in order to give a measure of low self-forgiveness (henceforth described in this thesis as "self-condemnation").

- *Obsessional beliefs questionnaire "OBQ" (OCCWG, 2003, 2005): 44 item version.*

This self-report measure was developed to assess 6 major cognitive domains thought by experts in the field to be OCD-related. Items were rationally derived to reflect these 6 cognitive domains, namely responsibility; importance of thoughts, control of thoughts, threat estimation, tolerance for uncertainty and perfectionism. An 87-item version was initially developed (OCCWG, 2003), in which participants rate their agreement with each statement using a 7-point Likert scale. For this scale, Cronbach's alpha varied from .71 to .93 for subscales across samples and test-retest reliability varied between 0.75 and 0.9 across subscales (OCCWG). Evidence supporting the criterion-related validity and convergent validity of the scale was presented. Some support for discriminant validity was also produced. A high level of correlations between the subscales was found. A subsequent analysis (OCCWG, 2005) produced a 44-item empirically-derived scale based on exploratory factor analysis of the original 87-item scale and this 44-item scale was used in the current study. The 44-item OBQ significantly correlates with the OCI-R ( $r=.59$ ,  $n=787$ : Wu,

personal communication). Wu and Carter (2008) also provided further evidence for the OBQ's specificity as a predictor of OCD. A factor analysis of the 44-item OBQ suggested 3 factors reflecting (1) Responsibility and threat estimation, (2) Perfectionism and intolerance for uncertainty, and (3) Importance and control of thoughts (OCCWG, 2005). Examples of items are "When I see any opportunity to do so, I must act to prevent bad things from happening." and "Things should be perfect according to my own standards."

- *Parental Psychological Control Scale-Youth Self-Report "PCSt"* (Barber, 1996) (*adapted*).

Barber based his scale on the Psychological Control Scale of the Child Report Parental Behavior Inventory (CRPBI) (Schaefer, 1965). It contains items pertaining to invalidation of feelings, constraining verbal expression, personal attack (blaming) and love withdrawal. Factor analysis demonstrated these belong to one over-riding factor (psychological control). The scale has 8 items that are scored using a 5-point Likert scale. The scale has demonstrated good internal consistency (ranging between .82 and .86; Luyckx, Soenens, Vansteenkiste, Berzonsky & Goossens, 2007). A version of the parental psychological control scale used by Arim and Shapka (2007) to measure peer psychological control ( $\alpha = .85$ ) was also used. In this exploratory study, the scores for each of mother's, father's and peer group psychological control were of interest as well as combinations of psychological control scores. This was because a lack of prior research made it difficult to predict which of these groups (if any) was most influential in relation to OC symptoms, and/or whether there was an additive effect of being psychologically controlled by more than one source. Test-retest reliabilities in this study were  $r = .901$  for mother's

psychological control,  $r=.876$  for father's psychological control,  $r=.742$  for peers' psychological control and  $r=.901$  for total psychological control score. Examples of items include "My mother stopped talking to me until I pleased her again" and "My father was less friendly with me if I did not see things his way"

- *Revised Obsessive Compulsive Inventory "OCI-R"* (Foa et al 2002).

This scale has 18 items rated on a 5-point Likert scale. Cronbach's alpha was between .81 and .91 for the different groups to which it was administered (Foa et al). Test-retest reliability was demonstrated in Foa et al's study as was the measure's convergent and divergent validity. Items include "I check things more often than necessary." and "I sometimes have to wash or clean myself simply because I feel contaminated."

- *Social Situations Questionnaire "SSQ"* (new self-report measure developed for use in this study).

The Social Situations Questionnaire was designed to assess attributions of ostracism intent in ambiguous social situations. The initial version of the scale that was presented to all participants consisted of 9 vignettes (and 5 "filler vignettes") and a total of 27 items pertaining to benign ("not ostracism"; "SSQn"), punitive ("SSQp") and oblivious ostracism ("SSQo") which follows from the categories of ostracism identified by Williams (2001). The final version of the scale used in the main analyses was reduced to 7 vignettes and 21 attribution intent items which are scored on a 5-point Likert scale. Cronbach's alphas and test-retest reliabilities are reported in the Results section (3.1.1.2 below).



### 2.6.1. Time Two measures

The following questionnaires were administered again at Time Two, two weeks after initial presentation, in order to establish test-retest reliability since these measures were adapted and new respectively:

- *Parental Psychological Control Scale-Youth Self-Report (Barber, 1996)*  
(adapted)
- *Social Situations Questionnaire*

### 2.7 Procedure:

Following ethical approval, the study was advertised in a variety of community settings including universities and libraries, by poster and emails. Potential participants were offered the incentive of entry into a £250 prize draw. They were invited to express their interest in participation by emailing the study email address, and were then sent the study Information Sheet, and a link to the online Consent Form hosted by surveygizmo.com. After informed consent was obtained, participants were emailed a link to the Personal Details form and research questionnaires. Questionnaires were then completed online at a time and place of the participants' own choosing. Questionnaires were presented in random order to each participant. Completion of all items on each questionnaire was compulsory with the result that a complete dataset was produced with no missing responses. Participants in the instrument development study were invited by email to complete a further subset of questionnaires 2 weeks later. Personal details were removed from responses and replaced with an identity number before scoring. Following initial data exploration, analyses were carried out in accordance with the study hypotheses.

### 2.7.1. Pilot Study Procedure: Part One: Development and pilot of new instrument

Studies of social information processing (SIP) typically use hypothetical situation questionnaires, in which vignettes are presented followed by questions designed to elicit responses that indicate participants' processing pattern (Crick & Dodge, 1994). Such studies using hypothetical situations methodology have often focused on intent attributions to explore individual differences in social processing and to link such differences with outcomes such as social adjustment (Crick & Dodge). The Social Situations Questionnaire developed for use in this study was based on this previous research and methodology. It was designed to measure ostracism intent attributions in ambiguous social situations using a vignette-style instrument. Development of the measure involved the following steps:

- 1 First, the researcher obtained previous self-report measures for intent attributions in ambiguous situations (e.g. Bailey & Ostrov, 2008; Nelson, Mitchell & Yang, 2008) that have been used for investigating social information processing in adults. Such self-report instruments are versions of Crick's (1995) Children's Social Behaviour Scale which have been modified for use with adults. In these instruments, brief vignettes are presented with a "situation" or "story" title such as "neighbour situation" (Nelson et al) and "lunch story" (Bailey & Ostrov). Each vignette presents an ambiguous social situation which the participant is asked to imagine themselves experiencing (for instance "Imagine that you are sitting outside your house one morning...two neighbours walk by...they say something to each other and laugh"; Nelson et al). In these existing instruments, four alternative intent attribution items are presented for each vignette. Respondents are required to make forced choices with regard

to their intent attribution (for example, with reference to the previous example, choices include “They were just having fun” or “They were trying to make you feel excluded”). Some evidence for the validity and reliability of these measures has been obtained.

One researcher who has developed an intent attribution instrument (David Nelson, personal communication) has found that data in an attributional study (Nelson, Mitchell & Yang, 2008) was highly skewed when using forced choice responses. That is, when a forced-choice of vignette items involving different types of intent attribution is presented, adult participants largely chose more socially desirable items, with only 4-5% choosing hostile intent attributions.

2. Vignettes and response items for the Social Situations Questionnaire were generated that were based on the existing measures mentioned above. Because the Social Situations Questionnaire was designed to measure ostracism intent attributions in ambiguous social situations rather than hostile intent attributions (which previous instruments were designed to measure), considerable modifications needed to be made to the existing vignettes and response items and new vignettes needed to be added. In addition, in order to avoid the problem of skewed responses resulting from a forced-choice format, adherence to each alternative intent attribution item was indicated on a Likert scale. The impetus for designing the Social Situations Questionnaire was to the need to measure punitive attributional intent in ambiguous social situations, but items pertaining to oblivious and benign ostracism were also generated. This follows from the categories of ostracism identified by Williams (2001). Items measuring adherence to these alternative forms of intent attribution (oblivious and “not ostracism”) were included so that the instrument a) has ecological validity (that is, adults will normally understand that more than one explanation

is possible and this format allows respondents to express this awareness) and b) has broader potential usefulness in research and clinical settings. Nine vignettes pertaining to ambiguous ostracism were generated. Three response items were presented after each vignette. For the purpose of the main study, the score was the total for the punitive intent attribution items only. Attributional intent item choices reflecting 3 different types of intent attribution (punitive, oblivious and “not ostracism”) were produced for each vignette based on face validity (e.g. “Your neighbours were criticising you for something” (a punitive ostracism item) and “Your neighbours didn’t bother with you because they look down on you” (an oblivious ostracism item)). Five “filler” items were also produced to reduce the demand characteristic of the instrument, some of which were modified versions of items from the instruments mentioned above.

3 An expert in the field (Kip Williams, who developed these categories of ostracism) confirmed that he agreed with the categorisation of the attribution items.

4 A panel of 11 clinical psychologists independently categorised the ostracism items as either punitive ostracism items, oblivious ostracism items or non-ostracism items.

5 The questionnaire was administered to each participant on two occasions with approximately a two week interval in accordance with the procedure described in 2.7.2 .

6 Internal consistency of the ostracism attribution scales were calculated using Cronbach’s alpha and the correlations between time one and time two scores were also calculated to give measures of test-retest reliability.

#### 2.7.1.2 Pilot study procedure: Part Two

In accordance with the procedure described in 2.7.2, the adapted version of the Psychological Control Scale was also administered twice, the second administration occurring two weeks after initial administration. Test-retest reliability was then calculated.

### **3. Results**

#### **3.1. Results of Pilot Study**

##### **3.1.1 Instrument development**

Eleven raters categorised each ostracism item using a forced choice of either punitive, oblivious or not ostracism. Intraclass correlation for raters categorisations was 0.99, confidence interval 0.981-0.996,  $p < .01$ . A very high level of concordance was therefore demonstrated.

Inter-item correlations for the three ostracism subscales (Punitive Ostracism, Oblivious Ostracism and Not Ostracism) are presented in Appendix 5 (Tables 17 to 19). Cronbach's alphas of the nine-vignette version of the social situations are presented in Table 1.

Inspection of the inter-item correlation matrices revealed that the "lunch" vignette produced items which negatively correlated with the other items in each scale. The "Hospital" vignette Oblivious Ostracism Scale item had very small correlations with other items in that scale. Table 1 also gives Cronbach's alphas with the "lunch" items and "hospital" items removed.

Table 1: Cronbach's alpha for 9-vignette version of the Social Situations Questionnaire

Scale	Cronbach's alpha	
	9-vignette version	7-vignette version with "lunch" and "hospital" items removed
Punitive Ostracism	.822	.882
Oblivious Ostracism	.735	.868
Not Ostracism	.634	.678

Given the improved internal consistency indicated by these alpha values, subsequent analyses using the Social Situations Questionnaire excluded the “lunch” and “hospital” vignette items. The Not Ostracism Scale could be improved by deletion of the cinema item which has low inter-item correlations with the rest of the items. However, the Not Ostracism Scale is not intended to be used in analyses; rather it is there to provide ecological validity by providing an opportunity for adults to express their awareness that there is more than one potential explanation for others’ behaviours in a given situation.

Histograms of the subscales of the Social Situations Questionnaire at Time One and Time Two revealed that the distributions were normal for Oblivious Intent Attributions and Not Ostracism Attributions, but slightly skewed to the left for Punitive Intent Attributions. Square root transformations of the Time One and Time Two Punitive Intent were used in the correlation analyses since the transformed variables were not skewed. Test-retest reliabilities for the subscales of the Social Situations Questionnaire are presented in the Table 2.

Table 2: Test-retest reliabilities for the Social Situations Questionnaire

	Time 1-Time2 Correlations (Pearson’s R)	Significance (2-tailed)	N
Punitive Ostracism	0.802	<0.001	109
Oblivious Ostracism	0.841	<0.001	109
Not Ostracism	0.733	<0.001	109

The highly significant correlation between results at the two time points suggests the Punitive and Oblivious Ostracism Scales have acceptable stability. The Not Ostracism scale has lower stability but test-retest reliability is significant at the  $p<0.001$  level.

3.1.2. *Adapted Parental Psychological Control Scale- Youth self-report (Barber, 1986) reliability.*

Test-retest reliabilities for the adapted versions of the Psychological Control Scale (Mothers', Fathers' and Peers' psychological control) are presented in Table 3. All scales have acceptable reliability.

Table 3: Test-retest reliability for the Psychological Control Scale

	Time 1-Time2 Correlations (Pearson's R)	Significance (2-tailed)	N
Mother's Psychological Control	0.903	<0.001	109
Father's psychological control	0.889	<0.001	109
Peers' psychological control	0.742	<0.001	109
Total Psychological control	0.901	<0,001	109

## 3.2. Results of Main Study

### 3.2.1 Descriptives and data exploration

Descriptive data (including mean scores, standard deviations and skewness) for all variables included in the study are shown in given in Table 6.

Table 4: Main Study Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
OCI-R	330	.00	60.00	18.19	12.82	.969	.134	.324	.268
OBQ	330	51.00	295.00	157.85	49.50	.249	.134	-.460	.268
R/T	330	18.00	106.00	58.27	19.50	.184	.134	-.450	.268
P/C	330	19.00	112.00	65.36	20.30	.015	.134	-.642	.268
I/CT	330	9.00	84.00	34.15	15.41	.775	.134	.049	.268
HFS	330	6.00	42.00	21.75	8.31	.304	.134	-.836	.268
PCSt	330	24.00	111.00	57.85	18.87	.303	.134	-.603	.268
SSQp	330	7.00	33.00	17.39	5.85	.241	.134	-.554	.268

KEY: OCI-R= OC Symptoms; OBQ=Full Scale OBQ-44 Score; R/T= Responsibility/Threat beliefs; P/C: Perfectionism/ certainty beliefs; HFS: Self-condemnation; PCSt: Total Psychological Control score; SSQp: punitive attributions



Histograms were plotted for each variable, which revealed many of the variables were skewed to the left. Conversion of the skewness values to z-scores confirmed that some of the variables were significantly skewed. Self-condemnation had significant negative kurtosis (statistic/standard error >1.96 p<.05.) Given the skewed nature of the data, square root transformations were applied to all variables. Plots of the transformed variable confirmed that the problem of skewed data was improved. Parametric correlations were then produced.

Table 5: Main Study Parametric Correlations

C.F.=Pearson's Correlation Coefficient N=332		OCIR	OBQ	R/T	P/C	I/CT	HFS	PCSt	SSQp
OCI-R	C.F.	1	.659**	.601**	.595**	.541**	.544**	.402**	.491**
	Sig. (2-tailed)		.000	.000	.000	.000	.000	.000	.000
OBQ	C.F.	.659**	1	.898**	.905**	.835**	.699**	.466**	.573**
	Sig. (2-tailed)	.000		.000	.000	.000	.000	.000	.000
R/T	C.F.	.601**	.898**	1	.726**	.667**	.605**	.421**	.529**
	Sig. (2-tailed)	.000	.000		.000	.000	.000	.000	.000
P/C	C.F.	.595**	.905**	.726**	1	.679**	.629**	.402**	.460**
	Sig. (2-tailed)	.000	.000	.000		.000	.000	.000	.000
I/CT	C.F.	.541**	.835**	.667**	.679**	1	.619**	.416**	.541**
	Sig. (2-tailed)	.000	.000	.000	.000		.000	.000	.000
HFS	C.F.	.544**	.699**	.605**	.629**	.619**	1	.466**	.521**
	Sig. (2-tailed)	.000	.000	.000	.000	.000		.000	.000
PCSt	C.F.	.402**	.466**	.421**	.402**	.416**	.466**	1	.394**
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000		.000
SSQp	C.F.	.491**	.573**	.529**	.460**	.541**	.521**	.394**	1
	Sig. (2-tailed)	.000	.000	.000	.000	.000	.000	.000	

\*\* . Correlation is significant at the 0.01 level (2-tailed).

KEY: OCI-R= OC Symptoms; OBQ=Full Scale OBQ-44 Score; R/T= Responsibility/Threat beliefs; P/C: Perfectionism/ certainty beliefs; I/CT: Importance/Control of thoughts; HFS: Self-condemnation; PCSt: Total Psychological Control score; SSQp: punitive intent attributions

### 3.2.2 Comparison of study data with those of previous studies.

#### 3.2.2.1 OCI-R Comparisons

In this study, the mean Total Score on the OCI-R was 18.19 (S.D.=12.82, range 0-60). Hajcak, Huppert, Simons and Foa's (2004) investigated the psychometric properties of the OCI-R in a student sample of n=395 with a gender balance similar to that of the current study. Mean Total Score on the OCI-R was 18.82 (S.D. 11.10) which is of a very similar magnitude to the current study. Compared to the mean Total Score in a patient sample (n=167) of 27.02 (S.D. 13.22) (Abramowitz & Deacon, 2006), the mean score of the OCI-R in this study was lower which is in line with expectations for a non-clinical sample.

#### 3.2.2.2 OBQ-44 Comparisons

In the current study, mean Total Score on the OBQ-44 was 157.85 (S.D. =49.5). In the paper that reports the development of the OBQ-44 (OCCWG, 2005) the mean Total Score of the OBQ-44 for the student control group (n=284) was 131.3, (S.D. 44.3). The Total Score for a community control group (n=86) was even lower (mean Total Score= 96, S.D. = 35.1). For the OCD group in that study, mean OBQ Total Score was 174 (S.D.=50.2). Therefore, in the current study, the mean Total Score for the OBQ-44 is closer to the mean Total Score of the OCD group score than that of the student and community control groups in the OCCWG (2005) study.

#### 3.2.2.3 Psychological Control Comparisons.

Much of the research using the unadapted original version of Barber's (1996) Psychological Control Scale-Youth Self-Report uses samples consisting of

participants under the age of 18 years. The majority of studies that use adapted versions of the scale with adults ask adults to self-rate their own psychological control behaviours rather than to rate the psychological control of others. Normative other-rating data for adult samples is therefore not readily available. In Soenens et al's (2007) study, Mother's and Father's Psychological Control Scale scores were collapsed together. Scores were entered into analyses as a mean score for each participant rather than a total score as in the current study. Using this scoring method, the mean Parental Psychological Control score in Soenens et al's study was 2.25 (S.D. = .99) for the 390 student participants (79% women and 21% men, mean age 18.7). Using the same scoring method, the mean for Parental Psychological Control in this study is 2.32 (S.D.=.93), which is almost exactly the same as the previous research. Peer Psychological Control is a relatively novel concept and no normative data from previous research is available to compare to data in the current study.

#### 3.2.2.4 Heartland Self-forgiveness Scale comparisons

The scoring protocol for the Self-forgiveness subscale of the Heartland Self-forgiveness Scale (HFS) (Thompson et al, 2005) was reversed in this study in order to produce a measure of self-condemnation. In order to make normative comparisons with previous research using the scale, raw data was scored in the recommended way. Mean self-forgiveness score for the re-scored HFS data in the Main Study sample was 26.27 (S.D. = 8.29). This compares with a self-forgiveness mean score for students in Thompson et al's (2005) study of 30.99 (n=1111, mean age=19, 52% female, 48% male). Self-forgiveness in the Main Study sample is therefore a little lower than in the previous research.

### 3.2.2.6 Comparison of relationships between variables

Little previous research has been published that uses the same combination of variables used in the current research, which limits the extent to which comparisons can be made regarding relationships between variables. In the current research, OC symptoms measured using the OCI-R correlated significantly with obsessive beliefs using the OBQ-44 ( $n=330$   $r=.659$   $p<.01$ ). A correlation between these two variables of  $r=.59$ ,  $n=761$  (Wu, personal communication) was found in previous research (Wu & Carter, 2008) which is comparable to the current research. No previous research has been published linking psychological control and OCD using the same instruments as the current study. However, one study measured these variables using instruments from which the instruments in the current study were derived. Aycicegi, Harris and Dinn (2001) measured OCD symptoms using the Obsessive Compulsive Inventory (OCI) (Foa, Kozak, Salkovskis, Coles & Amir, 1998) and parental psychological control using the relevant subscale of the Children's Report of Parent Behaviour Inventory (CRPBI-30) (Schludermann & Schludermann, 1988). They used a student sample ( $n=130$ , 70% females and 30% males, mean age 18). Bivariate regression analysis found OCI scores predicted maternal psychological control ( $R=0.22$   $F=6.7$  (1,128)  $p<.05$ ) and paternal psychological control ( $R=0.32$   $F=14.3$  (1,128)  $p<.000$ ). In the current study, the same analyses find that OCI-R scores predicted maternal psychological control ( $R=0.295$   $F=31.25$   $df=1,328$   $p<0.000$ ) and paternal psychological control ( $R=0.259$   $F=23.62$  (1,328)  $p<.000$ ). The relationship between these variables is therefore comparable. No additional research using the same or similar measures is available to make comparisons with the current research.

### 3.2.3 Regression Analyses for Main Study

#### 3.2.3.1 Assumption checks

Regression analyses were performed and outputs were examined to check the extent to which the assumptions of multiple regression analysis were met (Field, 2009, p. 220).

1 Assumption of no multicollinearity: Variance proportions were distributed across different eigenvalues for each predictor. The average variance inflation factor (VIF) was not substantially above 1 and no VIF was as high as 10 (a figure above 10 indicates a problem). Therefore the assumption of no multicollinearity was taken to be met.

2 Assumption of normally distributed errors: A histogram and normality plot of the residuals produced by one of the regression models indicated the residuals were positively skewed, therefore the assumption of normality was not met. The graph and plot of residuals arising after refitting the regression model with square-root transformed variables demonstrated improved normality of the residuals distribution.

3 Assumption of homoscedasticity and assumption of linearity: When standardized residuals of the transformed study variables were plotted against standardized predicted values for the regression models, examination of the resulting scatterplots indicated that for all models at each level of the predictor, the variance of the residuals was constant, indicating that the assumption of homoscedasticity was met. There were no obvious curves in the scatter patterns apart from when POE is regressed on ICT so the assumption of linearity was also taken to be met for the majority of regressions (Field, 2009).

5 Post hoc casewise diagnostics for the regressions indicated that 5 out of 330 cases had standardized residuals greater than 3. However, no Cook's distances were greater than 1 suggesting that the cases were not influential data points and were not exerting undue influence on the regression models (Field, 2009). Therefore no cases were excluded.

### 3.2.3.2 Obsessive Beliefs and POE variables regressed on OC Symptoms

Hierarchical regressions were used. Since Obsessive Beliefs factors are known to all be important in influencing OC Symptoms they were entered in Step 1 using the forced entry method. POE variables were then entered as a set, again using the forced entry method. Results of the regression analysis are shown in Tables 6 below.

Table 6: POE variables regressed on OC Symptoms controlling for Obsessive Beliefs.

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta ( $\beta$ )		
1** (Constant)	-2.15	.41		-5.23	.00
R/T	.34	.08	.30	4.58	.00
P/C	.32	.08	.27	4.11	.00
I/CT	.19	.07	.16	2.61	.01
2** (Constant)	-3.29	.48		-6.80	.00
R/T	.24	.08	.21	3.24	.00
P/C	.26	.08	.22	3.37	.00
I/CT	.07	.07	.06	.91	.37
HFS	.21	.10	.12	2.09	.04
PCSt	.10	.06	.08	1.76	.08
SSQp	.32	.11	.15	2.86	.00

a. Dependent Variable: OCI-R

Note  $R^2$  for Step 1=.43,  $\Delta R^2$  =.04 ( $p < .001$ ). \*\*=Model significant at  $p < .001$

KEY: OCI-R= OC Symptoms; OBQ=Full Scale OBQ-44 Score; R/T= Responsibility/Threat beliefs; P/C: Perfectionism/ certainty beliefs; I/CT: Importance/Control of thoughts; HFS: Self-condemnation; PCSt: Total Psychological Control score; SSQp: punitive intent attributions

When Obsessive Belief domains (R/T, P/C and I/CT) are regressed on OC Symptoms, each of the belief domain factors significantly predict OC Symptoms (R/T and P/C at the  $p<.001$  level and I/CT at the  $p<.05$  level). This Step 1 model accounts for 43% of the variance of OC symptoms. When POE variables are added to the model in Step 2, 47% of the variance of OC Symptoms is accounted for. Both models are highly significant (Model 1  $F(3,326)=80.72$   $P<.001$ ; Model 2  $F(6,323)=46.74$   $p<.001$ ). In the model that includes POE variables, all variables apart from I/CT and PCSt significantly predict OC Symptoms, R/T, P/C and SSQp at the  $p<.01$  level and HFS at the  $p<.05$  level.

### 3.2.3.3 POE variables regressed on Responsibility/Threat belief domain

POE variables were regressed on R/T in this model in one set using the forced entry method. Results are shown in Table 7 below.

Table 7: POE variables regressed on Responsibility/Threat beliefs

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta ( $\beta$ )		
1** (Constant)	1.79	.39		4.56	.00
HFS	.59	.08	.41	7.90	.00
PCSt	.13	.05	.13	2.64	.01
SSQp	.49	.09	.27	5.40	.00

a. Dependent Variable: R/T

Note:  $R^2 = .44$  \*\*Model significant at the  $P<.001$  level

KEY: OCI-R= OC Symptoms; OBQ=Full Scale OBQ-44 Score; R/T= Responsibility/Threat beliefs; P/C: Perfectionism/ certainty beliefs; I/CT: Importance/Control of thoughts; HFS: Self-condemnation; PCSt: Total Psychological Control score; SSQp: punitive intent attributions

The model accounts for 44% of the variance of Responsibility/Threat beliefs and is highly significant ( $F(3,326) = 85.32$   $P<.001$ ). All three POE variables

contribute significantly to R/T, HFS contributing the most ( $\beta=.41$   $P<.001$ ), then SSQp ( $\beta=.27$   $P<.001$ ) and PCSt is the least influential variable in the model ( $\beta=.13$   $p<.05$ ).

#### 3.2.3.4 POE variables regressed on Perfectionism/Certainty belief domain

POE variables were regressed on P/C in this model in one set using the forced entry method. Results are shown in Table 8 below.

Table 8: POE variables regressed on Perfectionism/Certainty beliefs

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta ( $\beta$ )		
1** (Constant)	2.67	.39		6.79	.00
HFS	.72	.08	.50	9.55	.00
PCSt	.11	.05	.11	2.24	.03
SSQp	.29	.09	.16	3.17	.00

a. Dependent Variable: P/C

Note:  $R^2 = .43$  Model significant at the  $p<.001$  level

KEY: OCI-R= OC Symptoms; OBQ=Full Scale OBQ-44 Score; R/T= Responsibility/Threat beliefs; P/C: Perfectionism/ certainty beliefs; I/CT: Importance/Control of thoughts; HFS: Self-condemnation; PCSt: Total Psychological Control score; SSQp: punitive intent attributions

The model accounts for 43% of the variance of Perfectionism/Certainty beliefs and is highly significant ( $F(3,326) = 81.59$   $P<.001$ ). All three POE variables contribute significantly to P/C, HFS contributing the most ( $\beta=.5$   $P<.001$ ), then SSQp ( $\beta=.16$   $P<.001$ ) and PCSt is the least influential variable in the model ( $\beta=.11$   $p<.05$ ).

#### 3.2.3.5 POE variables regressed on Importance/Control of Thoughts belief domain

POE variables were regressed on I/CT in this model in one set using the forced entry method. Results are shown in Table 9 below.



Table 9: POE variables regressed on Importance/Control of Thoughts belief domain

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.02	.38		.04	.97
HFS	.61	.07	.42	8.35	.00
PCSt	.11	.05	.11	2.32	.02
SSQp	.50	.09	.28	5.69	.00

a. Dependent Variable: I/CT

Note:  $R^2 = .46$  Model significant at the  $p < .001$  level

KEY: OCI-R= OC Symptoms; OBQ=Full Scale OBQ-44 Score; R/T= Responsibility/Threat beliefs;

P/C: Perfectionism/ certainty beliefs; I/CT: Importance/Control of thoughts; HFS: Self-condemnation; PCSt: Total Psychological Control score; SSQp: punitive intent attributions

The model accounts for 46% of the variance of Importance/Control of Thoughts beliefs and is highly significant ( $F(3,326) = 91.68$   $P < .001$ ). All three POE variables contribute significantly to I/CT, HFS contributing the most ( $\beta = .42$   $P < .001$ ), then SSQp ( $\beta = .28$   $P < .001$ ) and PCSt is the least influential variable in the model ( $\beta = .11$   $p < .05$ ).

### 3.2.4 Post hoc analyses: Effect sizes and Power calculations

The effect size for each of the four models presented in the results above was large. Post hoc power calculations based on the findings above indicate that each of the four models presented in the results achieved 100% power at the  $p < .001$  error probability level.

## **4. Discussion**

This study aimed to produce some initial evidence for the potential utility of a biopsychosocial theory of OCD; specifically, it aimed to provide evidence that affiliative threat (POE) helps to explain the relationship between obsessive beliefs and OC symptoms. The findings of the study will now be considered in relation to the study hypotheses, which will be accepted or rejected in the light of the study findings. A critique of the study will then be presented and the contribution of study findings to knowledge in the field of OCD will be considered. Possible implications for the treatment of OCD will also be discussed and recommendations will be made for future research into the relationship between ostracism experiences and OCD.

### **4.1 Discussion of study findings in relation to hypotheses**

Study findings are considered in the context of the study aims and hypotheses below.

#### **4.1.1 Discussion of Pilot Study findings.**

##### **4.1.1.1 Validity and reliability of a new measure of ostracism intent attributions**

The primary aim of the pilot study was to operationalize the concept of ostracism intent attributions for use in the Main Study by developing a valid and reliable self-report measure (the Social Situations Questionnaire) since no such measure has been published. The results of the pilot study demonstrated that there was a very high level of independent rater agreement on the categorisation of ostracism intent items (as either “punitive”, “oblivious” or “not”

ostracism) and this is taken as evidence of the instrument's construct validity. The Cronbach's alphas of the final 7-item version were all acceptable and supported the hypothesis that the subscales would be internally consistent. Of the three subscales, the "not ostracism" subscale was least internally consistent. Examination of the inter-item correlations revealed that the "not ostracism" item for the "Cinema" vignette had low correlations with the other "not ostracism" items. The wording of this item ("Your acquaintance has arranged to meet someone else" may be insufficiently differentiated from oblivious ostracism, and may therefore be improved by a change of wording (for example ("It was too dark for your friend to see you").

Acceptable stability of the instrument over time was also demonstrated by the significant correlations with large effect sizes between Time One scores and Time Two scores (administered approximately 2 weeks later). The evidence therefore supported the hypotheses relating to the validity and reliability of the instrument. Examination of the means of each ostracism variable suggests that on average, participants were least likely to attribute punitive intent to ambiguous ostracism. There was a stronger tendency to believe that ambiguous ostracism is "oblivious" in nature, and a stronger tendency still to reject the notion that ostracism was intentional. There was no significant skew in the distributions of the three scales (i.e. it appears that participants were just as likely to score high on each scale as they were to score low) suggesting that the problem of social desirability inherent in the forced choice design was resolved by the use of a Likert-scale design.

#### 4.1.1.2. Reliability of adapted psychological control scale

Barber's Parental Psychological Control Scale-Youth Self-Report (Barber, 1986) was adapted for the current study so that it could be used to measure retrospective perceived psychological control of peers as well as of parents. The adapted instrument showed acceptable stability over time between Time One and Time Two as demonstrated by the highly significant correlations and large effect sizes between the two time points. The prediction that maternal, paternal and peer psychological control could be reliably measured was therefore confirmed.

#### 4.1.1.3 Conclusions of Pilot Study

All of the hypotheses for the Pilot study were confirmed by the data. Some evidence for the reliability of the Social Situations Questionnaire was produced, and evidence regarding the reliability of the adapted version of the Psychological Control Scale-Youth Self-Report was also produced.

#### 4.1.2 Discussion of Main Study findings

The study aimed to answer whether POE variables explain some of the well-established link between obsessive beliefs and OC symptoms. The findings of the Main Study will be discussed for each POE variable in relation to the study hypotheses and in relation to previous research. Theoretical implications will be explored and conclusions will then be summarised.

##### 4.1.2.1 Self-condemnation

Self condemnation significantly predicted OC Symptoms controlling for obsessive beliefs factors and the other two POE variables. It also significantly predicted each of the factors of the OBQ-44 whilst controlling for total

psychological control score and punitive ostracism attributions. Of the three POE variables, it showed the strongest relationship with Responsibility/Threat beliefs (R/T), Perfectionism/Certainty beliefs (P/C) and Importance/Control of Thoughts beliefs (I/CT). Partial correlations of self-condemnation with the three OBQ-44 factors in this model indicate that it contributes 39%, 40% and 38% of the variance to R/T beliefs, P/C beliefs and I/CT beliefs respectively, and 16%, 16% and 18% to R/T beliefs, P/C beliefs and I/CT beliefs respectively when the other two POE variables are controlled for (See Appendix 7). The study hypothesis regarding self-condemnation was therefore supported. Since self-condemnation contributes strongly to the variance of the three factors of the OBQ-44 it appears to be conceptually close to the various domains of that measure.

Conceptualising cognition as dialogic emphasises self-to-self relating and also fosters consideration of tone, intent and “authority” of the internal “voice” (cognition) along with its content. According to the theoretical stance of this study, low self-forgiveness is taken to indicate an inner “relationship” consisting of an authority-infused “part” which relates to a relatively less powerful part, which experiences coldness and condemnation in relation to breaches or anticipated breaches of moral rules. This self-to-self relating is viewed as key to a model of cognition in which an anticipated internal gist-like “voice” has the capacity to trigger the threat-defence system.

As previously discussed in 1.3.10, the dialogical view of OC cognition developed in this thesis reconceptualises obsessive beliefs as intrinsically involving the notion of self-condemnation. For instance, a responsibility schema defined declaratively as “I have pivotal responsibility for preventing harm” can be dialogically reconceptualised as an anticipated, condemnatory, authoritarian

voice (“I will blame you and never forgive you if you break moral rules and I will ignore your distress at being so condemned”) directed at a less dominant voice (“I must account for breaches of moral rules and I will be blamed and never forgiven for such breaches”); the overestimation of threat belief is reconceptualised as a bodily sensation of threat triggered by the anticipated condemnation of the internal voice (and thenceforth a sense that if one is feeling anxious, there must be something dangerous causing the threat (c.f. Arntz, Rauner & van den Hout, 1995) and a “better safe than sorry” algorithm (c.f. Gilbert, 2001, p.18 - see also 1.2.3.9.4.1 above); perfectionism and certainty beliefs are reconceptualised as reflecting defences against the anticipatory fear of self- (and other-) condemnation; control of thoughts reflects a further internal defence against a condemnatory inner “voice” that defines both inner processes and external behaviours as moral issues and threatens punishment for both; and beliefs relating to the over-importance of thoughts are reconceptualised as relating to the automatic triggering of the threat-defence system by anticipated condemnation of internal events (thoughts and feelings) by the authoritarian “voice”, and thereby attributional processes that attempt to “make sense” of this internal state of threat (c.f. Arntz et al). Such a dialogical reconceptualisation of cognition therefore may potentially offer a parsimonious explanation for the association of belief domains with each other.

The concept of an internal “voice” that monitors, judges and condemns internal processes has similarities with Wells’ (1997) metacognitive theory of OCD. The central prediction of the metacognitive model is that the significance and danger of intrusions is most relevant to understanding the disorder and that negative appraisal of thoughts results in distress (Fisher, 2009). Metacognition is hypothesised by Wells to involve declarative beliefs about thinking (such as the

belief that thoughts can be controlled); feelings about thinking (such as a sense of confidence about thoughts), and strategies for monitoring and controlling cognition such as thought suppression and distraction. Attention to potential internal threats is maintained by maladaptive beliefs such as “paying attention to signs of threat keeps me safe” (Fisher). Obsessive belief domains are viewed by Wells as epiphenomena of metacognitive beliefs. Some evidence supportive of the metacognitive model has been produced such as the finding that changes in metacognitive beliefs predicted changes in OCD symptom levels (Solem, Haland, Vogel, Hansen, & Wells, 2009); and the finding that metacognitive beliefs about intrusions predicted OC symptoms over and above the belief domains indexed by the OBQ (Wells & Cartwright-Hatton, 2004). The dialogic reconceptualisation of such “metacognition” as an anticipated authoritative “voice” (that monitors, judges and condemns internal processes (thoughts and feelings) in the same way that a psychologically controlling parent may control and punish external expressions (verbal, emotional and/or behavioural) using punitive ostracism) may help to explain the OCD sufferer’s high stake in controlling inner processes, the difficulty in dismissing the authoritative “voice” and bodily sensations of threat and discomfort resulting from the pseudo-social threat that the internal “voice” represents.

Mancini and Gangemi (2004) reference a concept similar to this study’s concept of self-condemnation in their concept of “fear of guilt”, the guilt being seen as the emotion that may ensue from behaving irresponsibly. They argue that Salkovskis’s definition of responsibility (“*the belief that one has power which is pivotal to bring about or prevent subjectively crucial negative outcomes. These outcomes are perceived as essential to prevent. They may be actual, that is having consequences in the real world, and/ or at a moral level*”: Salkovskis &

Forrester, 2002 p.48) is neither necessary nor adequate for defining a mental state that regulates OC behaviour and that is sufficient for an individual to “feel responsible”. They propose that, in fact, OCD sufferers are actually afraid that their behaviour will not match up to their sense of duty rather than that a negative event may occur. This notion appears to implicitly make some suggestion regarding internal criticism/condemnation but is not explicitly explored by those researchers, nor is there any exploration of how such internal criticism/condemnation may be processed at a biological level, nor of a dialogic (self-to-self) inner relationship.

Self-condemnation/self-forgiveness was measured in the current study in an attempt to operationalize the hypothesised existence and activation of an internal condemnatory voice. The condemnatory “voice” is also conceptualised as being “cold” in tone, distant from the condemned part within the individual’s “internal space” (c.f. Hermans, 2001) and low in empathy/ sympathy and hence is capable of triggering a biological threat-defence response, but this study did not operationalize or explore these aspects. Rating declarative statements regarding one’s view of one’s relationship with oneself may not be the optimal method for operationalising this variable. Previous research into dialogical models of psychopathology has tended to use process research and discourse analysis to assess an individual’s “internal multiplicity” (e.g. Osatuke, Gray, Glick, Stiles & Barkham’s (2004) assimilation model). Given that the results offered some support for the hypothesis that self-condemnation plays a role in OCD, further research into these aspects of self-condemnation in relation to OCD is warranted.



#### 4.1.2.2 Punitive ostracism intent attributions

Punitive ostracism intent attributions significantly predicted OC Symptoms controlling for obsessive beliefs factors and the other two POE variables. It also significantly predicted each of the factors of the OBQ-44 whilst controlling for self-condemnation and total psychological control score. Of the three POE variables, it had the strongest relationship with OC Symptoms after controlling for OBQ-44 factors and the other two POE variables. Partial correlations of self-condemnation with the three OBQ-44 factors in this model indicate that it contributes 28%, 21% and 29% of the variance to R/T beliefs, P/C beliefs and I/CT beliefs respectively, and 8%, 3% and 9% to R/T beliefs, P/C beliefs and I/CT beliefs respectively when the other two POE variables are controlled for (See Appendix 7). The study hypothesis regarding punitive ostracism intent attributions was therefore supported.

This study conceptualises punitive ostracism intent attributions as being linked with the hyperactivation of a “social monitoring system” (Pickett & Gardner, 2005). Alternatively, they may be conceptualised as a bias in social information processing (SIP) (e.g. Crick & Dodge, 1994) which results from experiences of punitive rejection. The internalisation of social experiences has been described in different literatures as object relations, IWMs, schemas, internal dialogues and so on. The types of social threat experiences which may lead to the development of such biases in SIP are viewed as being processed at a fundamental level in a similar manner to physical threats. Such biases may be linked with the tendency of the evolved brain to function on a “better safe than sorry” algorithm (Gilbert, 2001) when threatened, whether the threat is physical or social.

It is possible that SIP threat-based bias may trigger threat-defence responses within the appropriate “social mentality” (Gilbert, 1989, 1992, 2000) with its associated attentional, emotional, motivational and behavioural components. That is, if the context of the individual’s SIP biases cause the individual to experience ostracism as punitive, his or her attention, emotions, motivation and behaviours will be directed at issues of affiliation as opposed, for instance, to issues of status, esteem and competition which are viewed as relating to the “ranking mentality” (and which, therefore, may have some link with the experience of oblivious ostracism, although this was not explored in this study).

A key issue with regard to the impact of POE on OC Symptoms is the notion that OCD sufferers may have had experiences of ostracism that is manipulative and non-contingent. Such manipulation (i.e. psychological control) effectively positions the target as a perpetrator and hence responsible for (moral) harm but the nature of the moral breach and the nature of the punishment are likely to both be experienced as ambiguous. Hypervigilance to cues of punitive ostracism and a tendency to over-attribute ambiguous social signals to punishment (“better safe than sorry”) may then motivate perfectionist strategies and compulsions in an attempt to pre-empt further blame and also reparative social behaviours (such as confessing and reassurance-seeking).

#### 4.1.2.3 Recalled psychological control.

Total score psychological control did not significantly predict OC Symptoms when obsessive beliefs factors and the other two POE variables were controlled for. It did significantly predict each of the factors of the OBQ-44 whilst controlling for self-condemnation and punitive ostracism intent attributions, but it had the least influence on these models. Partial correlations of total

psychological control with the three OBQ-44 factors in this model indicate that it contributes 18%, 16% and 17% of the variance to R/T beliefs, P/C beliefs and I/CT beliefs respectively, and 2%, 2.% and 2% to R/T beliefs, P/C beliefs and I/CT beliefs respectively when the other two POE variables are controlled for (See Appendix 7). The study hypotheses regarding psychological control were therefore only partially supported.

Clearly, recalled psychological control cannot be taken as a valid reflection of lived experiences without further research which is longitudinal in nature. Further research clarifying the extent to which perceptions of psychological control are validated e.g. by observer reports is therefore required. It is possible that the non-significance of the link between psychological control and OC symptoms controlling for the other POE variables and obsessive beliefs indicates that OCD sufferers are not significantly more likely than non-sufferers to have experienced controlling punitive ostracism by parents and peers. However, it is also possible that a Type Two error was made in the study, resulting from sampling error or from difficulties in operationalizing the concept of remembered punitive ostracism. For instance, the Psychological Control Scale (Barber, 1986) includes items pertaining to verbal control as well as punitive ostracism. Memories of past experiences appear to have less direct impact on OC symptoms than certain cognitive styles (that may, nevertheless, have been initially caused, at least in part, by social threat experiences). Individuals may have suffered psychological control in the past, but given its sometimes subtle nature it may not been laid down in memory as strongly and clearly as more obvious forms of threat and trauma. It is also in the nature of memories that they are liable to fade and become less accurate over time.

Whilst it was hypothesised that memories of psychological control may contribute to the maintenance as well as the development of self-condemnation and punitive ostracism intent attributions, it may be that the latter two variables have a stronger role in maintenance of the OCD once they are established than do memories of prior experiences. Punitive ostracism attributions and self-condemnation may cause the individual to continue to lay down memories of punitive ostracism, but this phenomenon was not captured in the Psychological Control Scale given to the participants which focused only on childhood memories. Nevertheless, memories of psychological control do significantly contribute variance to both OC symptoms and obsessive beliefs when the other study variables are not controlled for (see Appendix 8). Of the three subscales (maternal, paternal and peer psychological control), peer psychological control made the strongest contribution to OC symptoms controlling for the other psychological control scales. Experiences with peers have not been focused on in previous OCD research, so this result suggests that further investigation of possible links between peer experiences (e.g. bullying in the form of “indirect aggression”) may be warranted.

#### 4.1.2.4 Discussion of the POE concept in relation to study findings and previous research

As previously described, POE is a construct developed for the purpose of this study. It is composed of variables that are construed as relating to the experience of punitive ostracism, whether that be recalled experiences, or the inner experience of unforgiving “self-to-self” relating, or a social information processing bias reflecting hypervigilance to a fundamental social threat (punitive ostracism). The study aimed to answer whether variables defined under the rubric “POE” helps to explain some of the variance of the established link

between obsessive beliefs and OC symptoms. Results of the study are generally supportive of this hypothesis, although the impact of memories of psychological control did not significantly contribute to the variance of OC symptoms once the other study variables are controlled for. The Importance/Control of Thoughts factor no longer significantly predicts OC Symptoms once POE variables are added to the model, demonstrating that POE confounds the relationship between this belief domain and OC symptoms.

POE has not been previously researched in the field of OCD, but certain concepts that have been researched in relation to OCD may have some conceptual overlap. As mentioned in 1.3.9, Pace et al (2011) have drawn together fragmented research findings relating to the relationship of criticism to OCD in a review of the literature pertaining to the cognitive appraisal model. They report research that has demonstrated the existence of a significant relationship between OCD and perceived criticism/hostility (e.g. Van Noppen & Steketee, 2009) and report that criticism has been related mainly to the belief domains of perfectionism and responsibility. Whilst it is possible that there is some overlap between the notion of criticism and the POE construct, in this study, all POE variables contribute significantly to effect of all three factors of the OBQ-44 on OC symptoms rather than a subset of belief domains. Challcombe and Salkovskis's (2009) suggestion that criticism can be assessed by, for instance, counting critical comments, also differentiates criticism from elements of POE. That is, the conceptualisation of criticism as overt and explicit overlooks the inferential, contextualised and implicit nature of much human communication; "cold-shouldering", "sending to Coventry" and giving someone the "silent treatment" are all effective ways of criticising literally without saying a word. The concept of psychological control allows for these

more subtle and manipulative ways of criticising others, controlling them (e.g. eliciting guilt and reparative action by means of “sham moral aggression”; Trivers, 1971) and punishing them using ostracism. It also allows for the possibility that the non-contingent and unfathomable negative reinforcement schedule suggested by the psychological construct may produce superstitious behaviours in the form of internal and external rituals (c.f. Aycicegi et al 2002, 1.2.3.9.5 above).

Pace et al (2011) also report that the link that researchers generally make between criticism and perfectionism/responsibility is a desire for approval (e.g. Frost, Marten, Lahart, & Rosenblate, 1990) and avoidance of accountability and blame (e.g. Rachman, 1976). Here, an orientation to potential social threat (punitive ostracism/condemnation) is implicitly referred to within the concepts of “desire for approval” and “avoidance of blame/accountability”. That is, both of these could be seen as defensive “safety strategies” designed to avoid rejection/ostracism/potential punishment or condemnation. Bhar & Kyrios’s (1999) finding that “sociotropy” was predictive (along with socially-prescribed perfectionism) of OC symptoms after controlling for gender and depression further illustrates the apparent heightened orientation towards acceptance and vigilance to the threat of ostracism in people who suffer from OCD.

#### 4.1.2.5 Study findings conclusions

The central premise of the study that variables defined as “punitive ostracism experiences” add to our understanding of the link between obsessive beliefs and OC symptoms was supported. Overall, the evidence supported the hypotheses, although memories of psychological control did not contribute significantly to the variance of OC symptoms after the other study variables

were controlled for. A new instrument has been developed for the purpose of the study that has demonstrated acceptable psychometric properties, and its punitive ostracism intent scale performed in the manner predicted in relation to obsessive beliefs and OC symptoms. The discriminative validity of the three different scales of the new instrument was not investigated in this study. Further research and development of the scale will be needed to further validate it and test its utility as a psychometric instrument.

## **4.2 Methodological Issues**

### **4.2.1 Strengths of the study**

The study has a number of strengths. Its main strengths lie in its innovation as described below.

Firstly, it offers a novel theoretical approach to understanding how extant findings in the social, biological and psychological domains may be linked, as well as offering a theoretical basis for understanding why these links occur in terms of evolutionary theory. Cognition, traditionally viewed as schematic and referential is reconceptualised as brain-based and multi-voiced by drawing on neuroscientific models and psycholinguistic understandings. Psycholinguistic perspectives on cognition offer understandings which draw together the referential aspects of language and its social/ “performative” aspects (that is, the notions that the social act lies at the heart of language and “meaning”), and which assert that conscious thought is essentially internalised “multi-voiced” speech that is necessarily affective and motivated and linked to biological requirements. This then provides a basis on which to understand the automatic triggering of conscious or tacit anxiety, pain or other threat-defence responding on a physiological level to internal dialogue, which in turn is learned and

absorbed from the voices and behaviours of others in the social milieu. Control of others by means of manipulative relationship/love withdrawal is another key aspect of the theory, since it may lead to biases in social information processing reflected in the anticipated ostracising, cold responses of both the external other and the internal “answering voice”. In summary, this novel approach answers Taylor et al’s (2007) call for a “comprehensive model of OCD” that integrates “mind and brain” (p. 24) and it provides a “fresh perspective” on OCD as called for by Whittal et al 2008, p.1003).

Secondly, a new measure has been constructed that operationalizes the concept of ambiguous ostracism intent attributions and some evidence of its internal consistency, validity and stability over time has been demonstrated. The measure has proved to have some relevance to OCD and has potential to be used in further research, either into OCD or other forms of psychopathology or more generally into ostracism and its impacts. The new measure also contributes to the novel construct of “punitive ostracism experiences”. The new measure also involved innovation of design in relation to vignette style attribution-intent measures since it used a Likert-scale rather than the forced-choice design that extant measures use. .

Thirdly, the study has used a relatively novel means of administering the measures to participants online. This has enabled the research to access a larger number of participants at a much lower cost than would have been possible using paper-and-pencil administration. Coles, Cook and Blake (2007) compared paper and pencil administration of the OBQ-44 and the OCI to administration over the internet in a non-selected student sample. Results of the study supported the equivalence of the measures regardless of administration method. Use of internet administration allows for compulsory



completion of all questions before the participant can move on to the next page, so there was no missing data. In addition, it allows for automatic randomisation of the order of presentation of the questionnaires, avoiding order effects.

Fourth, it examined the concept of psychological control in relation to OCD, and although this is not entirely novel, it formed part of a new conceptual understanding of OCD and its development. In addition, the study introduced the possibility that sufferers' experiences with their peers during their development may have a role in the development of the condition, and adapted an existing measure for investigating this hypothesis. Some initial evidence supporting the contribution of memories of psychological control and obsessive beliefs was produced, although the link between these memories and OC symptoms was not significant in this sample after other POE variables and obsessive beliefs were controlled for.

Fifth, the study and its findings have clear clinical relevance, which opens up new avenues of development and research into treatment for OCD. This is further discussed in section 4.3 below.

#### 4.2.2 Study Weaknesses and suggestions for future research

The study has a number of limitations, as a result of which conclusions and interpretations must be treated with some caution.

One limitation of the study is the nature of the sample. The study used a non-selected community sample, and recruited anyone aged 18 or over who responded to the study advertisement, which described itself as a study into mental health. The advertisement was disseminated in electronic form as well as posters and flyers. It was advertised widely within several institutes of higher

education but also as an advertisement in a community free newspaper, as fliers in public libraries and so on. Spontaneous comments made by a number of individuals who responded by email to the advertisement indicated that they had a history of mental health problems and that the advertisement had been disseminated to and by mental health support/action groups. Whilst there is no obvious reason to believe that this introduced anything other than random error into the study, there is some possibility that the sample was affected by some unknown systematic error, for instance relating to mental health diagnosis or status. This could therefore lead to type I errors. Certainly, mean obsessive beliefs score in this sample was notably higher than in some previously-reported research using non-patient samples. Limited demographic information was collected, and there were no questions regarding participants' mental health history, so it was not possible to clarify this issue.

Furthermore, whilst the use of non-clinical samples in OCD research is common and in theory justified on the basis that OCD experiences occur on a continuum (Gibbs, 1996) in the general population, further research using clinical samples containing individuals who have been diagnosed with OCD will be necessary before conclusions can confidently be made. The findings of this study may potentially be specific to the particular measures used, and so replication using different measures of (e.g. of depression and OC symptoms) would potentially strengthen conclusions regarding the findings.

A further methodological limitation relates to the cross-sectional and retrospective nature of the study. Evidence of links between variables in this study can not be taken as evidence of causality. For instance, evidence that memories of psychological control experiences within childhood impacted on the association between obsessive beliefs and OC symptoms can not be taken

as evidence that psychological control by peers and/or parents cause either obsessive beliefs or OC symptoms. A longitudinal design (including independent ratings of psychologically controlling behaviours by peers and parents) would be required to clarify the nature of OCD sufferers' social experience during their development and its resulting impact upon their thinking, responding and psychopathology in adult life.

In this study, the aim was to demonstrate associations between POE and the independent and dependent variables (OC symptoms and obsessive beliefs) rather than to prove any causal links. One reason for an association between a POE variable (self-condemnation) and obsessive belief domains has been argued to be conceptual. For instance, rather than self-condemnation *causing* responsibility beliefs, the suggestion is that the former variable offers a reconceptualisation of such beliefs in terms that are more affective, intrinsically social and less static than the traditional conceptualisation of responsibility beliefs. In fact in this study all three POE variables (memories that involve punitive ostracism; inner dialogue that evokes an experience that is similar to that of punitive ostracism; and perceptions of the social environment that cause a bias to interpretations of punitive ostracism in ambiguous situations) are hypothesised to be intrinsic to attitudes towards, salience of and responses to internal and external moral/accountability-related issues (including, for OCD sufferers, internal issues). However, it is also possible that POE variables do have a causative link with some or all of the obsessive belief domains (and vice versa). Issues of causality may be more appropriately investigated in longitudinal research and in research that uses more complex analyses such as structural equation modelling. Further evidence for the theoretical stance may

be the degree to which it explains and predicts relationships between variables and outcomes to interventions that are based on the theory.

The study did not control for other conditions such as depression and generalised anxiety and this again limits what can be concluded. The theoretical stance of the study suggests that the impact of POE is specific to OCD, but the lack of inclusion of anxiety and depression measures means that this conclusion can not yet be drawn. Comorbidity with depression often occurs in OCD (37% of cases in Torres et al's 2006 British study), and it is possible that depression could in turn confound the link between POE and obsessive beliefs. However, depression may also be a consequence of OCD. Again, the implication is that more complex models and analyses are required to better understand the complex relationships between OCD-related variables.

In addition, OCD is a heterogeneous condition, with highly idiosyncratic symptoms-sets amongst individual sufferers (McKay et al., 2004), and there is some evidence that there may be some differences between aetiologies and maintenance factors amongst different symptoms subsets. This study did not analyse the data on the basis of symptoms subsets, so at this stage, no confident assertion can be made regarding the applicability of the conclusions across all symptoms subsets. Indeed, the OCI-R used in this study to assess OC symptoms is weighted more towards measuring compulsions than obsessions (Foa et al., 2002), therefore the results in this study may be specific to these types of symptoms. Further research using different measures of OCD and including symptoms subtypes in the analysis will be needed to clarify these issues.

The SSQ was developed for use as a measure of bias in social information processing towards interpretation of ambiguous ostracism as punitive in nature. Whilst some evidence of its validity and reliability has been presented, it will need further validation to strengthen the study findings. At this stage its factor structure is unclear, and there is a possibility, for instance, that punitive ostracism and oblivious ostracism are part of the same factor structure using this measure, so again results must be interpreted with caution.

Finally, the thrust of this study has been to present an argument for a biopsychosocial model of OCD. However, this research did not include any evidence from the biological domain, and research that involves biological variables will be needed in order to further assess the validity and usefulness of this model. For example, in a neuroimaging study, Masten et al (2011) found that level of activation in the ACC whilst 13 years olds were ostensibly “excluded” by peers during an online task, was associated with parent-reported depressive symptoms a year later. A similar paradigm could be used to potentially make links with OC symptoms. Williams and Jarvis (2006) created a “cyberball” virtual ball-toss game to simulate ostracism for use during functional magnetic resonance imaging (fMRI) and recently Goodacre and Zadro (2010) simulated ostracism for use in fMRI research using an ostensible real-time webcam conversation which actually involved pre-recorded clips of confederates which could then be manipulated to give the participant the impression that he or she was being ostracised. Such techniques could potentially be adapted for use in OCD research; for example, independent groups of participants could be “primed” using tasks that manipulate responsibility before they experience “virtual” ostracism (as described above); the criterion measure in this example could be degree of activation of OCD-

relevant parts of the brain. Another avenue of investigation may be to study whether drugs that have been shown to have some impact on the experience of “social pain” may also impact on OC symptoms or on “just not right” feelings. For example, Dewal, MacDonald, Webster, Masten and Baumeister (2010) found that the analgesic acetaminophen (which exerts its effect on pain through the central rather than the peripheral nervous system) reduced the experience of social pain in participants. If use of such a drug could be shown to reduce OC symptoms and/or “just not right” experiences in OCD sufferers, then this would provide further evidence of the validity of the biopsychosocial model.

### **4.3 Clinical implications of study findings**

The findings and the study’s theoretical underpinnings have some clinical implications with regard to directions for development of treatments for OCD. As previously discussed, pharmacological, cognitive and behavioural treatments for OCD, whilst effective to some degree, nevertheless have problems with non-compliance, relapse, and a proportion of sufferers do not benefit these treatments. This study’s biopsychosocial model of OCD describes a “multi-voiced self” whose internal dialogue can trigger the threat-defence system and hence influence attention, affect, motivation and physiology. The reconceptualisation offered by the biopsychosocial model, together with the finding that self-condemnation plays a mediational role in the impact of obsessional belief domains on OC symptoms, point to the possibility that an approach to OCD treatment that targets the individual’s self-to-self relating may be fruitful. Recent developments in cognitive therapy include the development of “compassion focused therapy” which includes techniques described as “compassionate mind training” (e.g. Gilbert, 2010). Some evidence for the effectiveness of this approach in reducing shame, self-criticism, depression and

anxiety in clinical groups has been presented (e.g. Gilbert & Proctor, 2006). This approach to therapy itself draws on evolutionary psychology and on brain-based understandings of cognition and conceptualises the impact of some of the training methods as a kind of “neuro-physio-therapy” for the brain (Gilbert, 2005, p. 295). This approach has, to date, not been evaluated in relation to OCD or to self-condemnation/self-forgiveness, but this study does provide evidence that investment in such development and evaluation in future would be warranted. Similarly, dialogical approaches to therapy (e.g. that work with an individual’s internal “voices” by increasing recognition of them and rebalancing the power and authority of different internal voices) may have something to contribute to the treatment of OCD (e.g. Whelton and Greenberg, 2004). It seems possible that an initial treatment focus on increasing self-forgiveness and self-empathy, and on reducing the power and authority of the condemning internal “voice” may decrease the aversiveness of exposure/response prevention and increase willingness to undertake behavioural experiments, and hence may improve the high attrition rates associated with traditional behavioural and cognitive approaches in OCD. This would potentially provide further empirical evidence for the validity of the model, and may also improve our ability to alleviate the suffering caused by this often debilitating condition.

#### **4.4 Conclusions**

Having offered an argument for a biopsychosocial conceptualisation of OCD, the study attempted to operationalize some of the concepts involved in this theoretical stance in order to provide some initial evidence for the validity of the theory over and above the presentation of the argument. The findings largely support the study hypotheses. However, the study also has a number of

limitations that require that findings are interpreted with caution. Nevertheless, the aim was to produce sufficient evidence to warrant further research and testing of the biopsychosocial model, and it is asserted that this over-riding goal has been achieved.

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## 6. Appendices

Appendix 1: Measures (all measures were posted on a surveygizmo.com webpage)

### 1. Obsessive Compulsive Inventory-Revised

The following statements refer to experiences that many people have in their everyday lives. Circle the number that best describes HOW MUCH that experience has DISTRESSED or BOTHERED you during the PAST MONTH. The numbers refer to the following verbal labels.

	Not at all 0	A little 1	Moderately 2	A lot 3	Extremely 4
1. I have saved up so many things that they get in the way.	0	1	2	3	4
2. I check things more often than necessary.	0	1	2	3	4
3. I get upset if objects are not arranged properly.	0	1	2	3	4
4. I feel compelled to count while I am doing things.	0	1	2	3	4
5. I find it difficult to touch an object when I know it has been touched by strangers or certain people.	0	1	2	3	4
6. I find it difficult to control my own thoughts.	0	1	2	3	4
7. I collect things I don't need.	0	1	2	3	4
8. I repeatedly check doors, windows, drawers etc.	0	1	2	3	4
9. I get upset if others change the way I have arranged things.	0	1	2	3	4
10. I feel I have to repeat certain numbers.	0	1	2	3	4
11. I sometimes have to wash or clean myself simply because I feel contaminated.	0	1	2	3	4
12. I am upset by unpleasant thoughts that come into my mind against my will.	0	1	2	3	4
13. I avoid throwing things away because I am afraid I might need them later.	0	1	2	3	4
14. I repeatedly check gas and water taps and light switches after turning them off.	0	1	2	3	4
15. I need things to be arranged in a particular order.	0	1	2	3	4
16. I feel that there are good and bad numbers.	0	1	2	3	4
17. I wash my hands more often and longer than necessary	0	1	2	3	4
18. I frequently get nasty thoughts and have difficulty in getting rid of them.	0	1	2	3	4

## 2. Obsessive Beliefs Questionnaire-44

This inventory lists different attitudes and beliefs that people sometimes hold. Read each statement carefully and decide how much you agree or disagree with it. For each of the statements, choose the number matching the answer that best describes how you think. Because people are different, there are no right or wrong answers.

To decide whether a given statement is typical or your way of looking at things, simply keep in mind what you are like most of the time.

Use the following scale:

See the following scale:

1	2	3	4	5	6	7						
Disagree very much	Disagree moderately	Disagree a little	Neither Agree nor disagree	Agree a little	Agree moderately	Agree very much						
1	I often think things around me are unsafe.					1	2	3	4	5	6	7
2	If I'm not absolutely sure of something, I'm bound to make a mistake.					1	2	3	4	5	6	7
3	Things should be perfect according to my own standards.					1	2	3	4	5	6	7
4	In order to be a worthwhile person, I must be perfect at everything I do.					1	2	3	4	5	6	7
5	When I see any opportunity to do so, I must act to prevent bad things from happening.					1	2	3	4	5	6	7
6	Even If harm is very unlikely, I should try to prevent it at any cost.					1	2	3	4	5	6	7
7	For me, having bad urges is as bad as actually carrying them out.					1	2	3	4	5	6	7
8	If I don't act when I foresee danger, then I am to blame for any consequences.					1	2	3	4	5	6	7
9	If I can't do something perfectly, I shouldn't do it at all.					1	2	3	4	5	6	7
10	I must work to my full potential at all times.					1	2	3	4	5	6	7
11	It is essential for me to consider all possible outcomes of a situation.					1	2	3	4	5	6	7
12	Even minor mistakes mean a job is not complete.					1	2	3	4	5	6	7
13	If I have aggressive thoughts or impulses about my loved ones, this means I may secretly want to hurt them.					1	2	3	4	5	6	7
14	I must be certain of my decisions.					1	2	3	4	5	6	7
15	In all kinds of daily situations, failing to prevent harm is just as bad as deliberately causing harm.					1	2	3	4	5	6	7
16	Avoiding serious problems (for example, illness or accidents) requires constant effort on my part.					1	2	3	4	5	6	7
17	For me, not preventing harm is as bad as causing harm.					1	2	3	4	5	6	7
18	I should be upset if I make a mistake.					1	2	3	4	5	6	7
19	I should make sure others are protected from any negative consequences of my decisions or actions.					1	2	3	4	5	6	7
20	For me, things are not right if they are not perfect.					1	2	3	4	5	6	7

21	Having nasty thoughts means I am a terrible person.	1	2	3	4	5	6	7
22	If I do not take extra precautions, I am more likely than others to have or cause a serious disaster.	1	2	3	4	5	6	7
23	In order to feel safe, I have to be as prepared as possible for anything that could go wrong.	1	2	3	4	5	6	7
24	I should not have bizarre or disgusting thoughts.	1	2	3	4	5	6	7
25	For me, making a mistake is as bad as failing completely.	1	2	3	4	5	6	7
26	It is essential for everything to be clear cut, even in minor matters.	1	2	3	4	5	6	7
27	Having a blasphemous thought is as sinful as committing a sacrilegious act.	1	2	3	4	5	6	7
28	I should be able to rid my mind of unwanted thoughts.	1	2	3	4	5	6	7
29	I am more likely than other people to accidentally cause harm to myself or to others.	1	2	3	4	5	6	7
30	Having bad thoughts means I am weird or abnormal.	1	2	3	4	5	6	7
31	I must be the best at things that are important to me.	1	2	3	4	5	6	7
32	Having an unwanted sexual thought or image means I really want to do it.	1	2	3	4	5	6	7
33	If my actions could have even a small effect on a potential misfortune, I am responsible for the outcome.	1	2	3	4	5	6	7
34	Even when I am careful, I often think that bad things will happen.	1	2	3	4	5	6	7
35	Having intrusive thoughts means I'm out of control.	1	2	3	4	5	6	7
36	Harmful events will happen unless I am very careful.	1	2	3	4	5	6	7
37	I must keep working at something until it's done exactly right.	1	2	3	4	5	6	7
38	Having violent thoughts means I will lose control and become violent.	1	2	3	4	5	6	7
39	To me, failing to prevent a disaster is as bad as causing it.	1	2	3	4	5	6	7
40	If I don't do a job perfectly, people won't respect me.	1	2	3	4	5	6	7
41	Even ordinary experiences in my life are full of risk.	1	2	3	4	5	6	7
42	Having a bad thought is morally no different than doing a bad deed.	1	2	3	4	5	6	7
43	No matter what I do, it won't be good enough.	1	2	3	4	5	6	7
44	If I don't control my thoughts, I'll be punished.	1	2	3	4	5	6	7

### 3. Heartland Forgiveness Scale (self-forgiveness subscale)

Directions:

In the course of our lives negative things may occur because of our own actions. For some time after these events, we may have certain thoughts or feelings about ourselves.

Think about how you typically respond to such negative events. Next to each of the following items circle the number (from the 7-point scale below) that best describes how you typically respond to these types of negative situations.

There are no right or wrong answers. Please be as open as possible in your answers.

How do you think when a bad situation occurs because of your own actions?	Nearly always true of me						Hardly ever true of me
1. Although I feel bad at first when I mess up, over time I can give myself some slack.	1	2	3	4	5	6	7
2. I hold grudges against myself for negative things I've done.	1	2	3	4	5	6	7
3. Learning from bad things that I've done helps me get over them.	1	2	3	4	5	6	7
4. It is really hard for me to accept myself once I've messed up.	1	2	3	4	5	6	7
5. With time I am understanding of myself for mistakes I've made.	1	2	3	4	5	6	7
6. I don't stop criticizing myself for negative things I've felt, thought, said or done.	1	2	3	4	5	6	7

Scoring Instructions:

To calculate the scores for the HFS total and its three subscales, first reverse score items 2, 4, 6,

#### 4. Psychological Control Scales

##### MY MOTHER AND ME

Below you can find a number of statements about the relationship with your mother when you were growing up.

Please circle a number between 1 (totally disagree) and 5 (totally agree).

During my childhood my mother:	Totally Disagree			Totally Agree	
•was always trying to change how I feel or think about things	1	2	3	4	5
•changed the subject whenever I had something to say	1	2	3	4	5
•often interrupted me	1	2	3	4	5
•blamed me for hers and/or other family members' problems	1	2	3	4	5
•brought up past mistakes when she criticized me	1	2	3	4	5
•was less friendly with me if I did not see things her way	1	2	3	4	5
•avoided looking at me when I disappointed her.	1	2	3	4	5
•stopped talking to me until I pleased her again.	1	2	3	4	5

##### MY FATHER AND ME

Below you can find a number of statements about the relationship with your father when you were growing up.

Please circle a number between 1 (totally disagree) and 5 (totally agree).

During my childhood, my father:	Totally Disagree			Totally Agree	
•was always trying to change how I felt or thought about things.	1	2	3	4	5
•changed the subject whenever I had something to say.	1	2	3	4	5
•often interrupted me.	1	2	3	4	5
•blamed me for his and/or other family members' problems.	1	2	3	4	5
•brought up past mistakes when he criticized me.	1	2	3	4	5
•was less friendly with me if I do not see things his way	1	2	3	4	5
•avoided looking at me when I disappointed him	1	2	3	4	5
•stopped talking to me until I pleased him again.	1	2	3	4	5

##### PEOPLE IN MY PEER GROUP

Below you can find a number of statements about the relationship with people in your peer group when you were growing up. Please circle a number between 1 (totally disagree) and 5 (totally agree).

During my childhood, people in my peer group:	Totally Disagree			Totally Agree	
•were always trying to change how I felt or thought about things	1	2	3	4	5
•changed the subject whenever I had something to say	1	2	3	4	5
•often interrupted me	1	2	3	4	5
•blamed me for their problems	1	2	3	4	5
•criticized me by bringing up past mistakes	1	2	3	4	5
•were less friendly with me if I did not see things their way.	1	2	3	4	5
•avoided looking at me if I disappointed them	1	2	3	4	5
•stopped talking to me until I pleased them again.	1	2	3	4	5

## 5. Social Situation Questionnaire

### Directions:

- When we are around people, it is sometimes not fully clear what their intentions are. At the moment this occurs, we may have one or more explanations for what happened.
- You will be reading a few stories about situations in which the intentions of others may not be clear. Try to imagine that the situation in each story is happening **to you**.
- After each story is a short list of explanations for what happened. For each explanation, please circle **how likely** it is that you would believe each one at the moment it occurred.
- REMEMBER- imagine that **you** are the person in the story and focus on your **immediate** reaction. Try to answer as honestly as you can.

Imagine the situation below has just happened to you:	How likely is it that you think:	Very Likely			Very Unlikely
<b>1. Cinema Situation</b> Imagine that you are at the local cinema. You unexpectedly see an acquaintance searching for a seat. As you look in your acquaintance's direction, she/he sits next to someone else.	A. Your acquaintance has arranged to meet someone else	5	4	3	2 1
	B. Your acquaintance thinks he/she is too good for you	5	4	3	2 1
	C. Something you have done has annoyed your acquaintance so he or she ignored you	5	4	3	2 1
<b>2. Car Situation</b> Imagine you see one of your neighbours back out of his/her driveway and into your car, which is parked on the side of the street. Your neighbour does not stop to assess the damage but drives away.	A. Your neighbour couldn't care less if he/she hit your car	5	4	3	2 1
	B. Your neighbour hit your car by accident but was in a hurry and decided that he/she would tell you about the accident later	5	4	3	2 1
	C. Your neighbour does not like you to keep your car on the street and he/she was showing his/her frustrations	5	4	3	2 1
<b>3. Neighbour Situation</b> Imagine that you are doing some jobs outside your house one morning. Two of your neighbours walk by. As they walk by you they say something to each other but don't acknowledge you	A. Your neighbours were criticising you for something	5	4	3	2 1
	B. Your neighbours were too absorbed in their conversation to notice you	5	4	3	2 1
	C. Your neighbours didn't bother with you because they look down on you	5	4	3	2 1
<b>4. Party Situation</b> Imagine that you are at a party. You are standing with a group of people. One person in this group is particularly outgoing and is leading the conversation. You notice that this person does not look at you or respond when you say something.	A. The person is showing you that he/she is offended by what you said	5	4	3	2 1
	B. The person considers that you are uninteresting	5	4	3	2 1
	C. The person is a good talker but not a good listener	5	4	3	2 1

Imagine the situation below has just happened to you:	How likely is it that:	Very Likely	Very Unlikely
<b>5. Traffic Situation</b> Imagine that you are driving down the road in fairly heavy traffic. You are in the fast lane and passing quite a few cars in other lanes. Unexpectedly, someone changes lanes right in front of you. You have to hit your brakes to keep from hitting him/her.	A. You assume you were in the driver's blind spot, so he/she did not see you when changing lanes	5	4 3 2 1
	B. You assume the driver cut you off on purpose to see if he/she could slow you down	5	4 3 2 1
	C. You assume the driver was tired and not paying attention to what he/she is doing	5	4 3 2 1
<b>6. Work Situation</b> Imagine that your boss is choosing people to do a task with him or her. Your boss chooses some of your colleagues for the task but not you and does not explain why.	A. Your boss thinks you've enough to do already	5	4 3 2 1
	B. Your boss thinks you've made mistakes on previous tasks he/she has given you	5	4 3 2 1
	C. Your boss has overlooked you	5	4 3 2 1
<b>7. Break Room Situation</b> Imagine that you are walking toward the break room at work and you hear some of your colleagues. When you enter the room, they don't look at you or speak to you but carry on talking to each other.	A. Your colleagues don't think you are entertaining enough to include	5	4 3 2 1
	B. Your colleagues are giving you the silent treatment	5	4 3 2 1
	C. Your colleagues will speak to you when they notice you are there	5	4 3 2 1
<b>8. DVD Player Situation</b> Imagine that your neighbour calls to ask if he/she could borrow your new DVD player. When your neighbour returns the DVD player the next week, it is broken	A. It was an accident	5	4 3 2 1
	B. Your neighbour broke it to annoy you	5	4 3 2 1
	C. Your neighbour was jealous of your possessions and was careless with the DVD player	5	4 3 2 1
<b>9. Hospital situation</b> You find out that a friend has been admitted to hospital and has asked another friend to visit but not you.	A. Your sick friend is not pleased with you	5	4 3 2 1
	B. It never crossed your sick friend's mind to ask you	5	4 3 2 1
	C. The sick friend chose someone who is not as busy as you	5	4 3 2 1
<b>10. Lunch Situation</b> Imagine that you have arranged to meet up with a new friend in a pub or coffee bar. After 15 minutes, your friend still hasn't shown up.	A. Your new friend has forgotten about you	5	4 3 2 1
	B. Your new friend has got delayed	5	4 3 2 1
	C. Your new friend is blaming you for something	5	4 3 2 1



Imagine the situation below has just happened to you:	How likely is it that:	Very Likely	Very Unlikely
<b>11. Ticket Situation</b> Imagine that you and a friend decide to attend a concert. You volunteer to pick up the tickets, which are very expensive. Several weeks after the purchase, you realize that your friend has still not paid you for the tickets, and he/she hasn't said anything since.	A. Your friend misunderstood and thought you were paying  B. Your friend has forgotten he/she owes you and just needs a reminder  C. Your friend was hoping that you have forgotten all about it	5 4 3 2 1  5 4 3 2 1  5 4 3 2 1	
<b>12. Washroom situation.</b> Imagine that you are in a cubicle of the washroom at work. You hear two of your colleagues talking about a group of colleagues going bowling together. No-one has mentioned this to you	A. Your colleagues are punishing you for something  B. Your colleagues invited the people they thought were most fun  C. Your colleagues/fellow students have not yet got round to mentioning the bowling to you	5 4 3 2 1  5 4 3 2 1  5 4 3 2 1	
<b>13. Restaurant Situation</b> Imagine that you are sitting in a restaurant. The people next to you are laughing and talking. One of them abruptly stands up and his/her chair knocks into yours. You spill your drink as a result. You hear continued laughter from their table.	A. The person did it on purpose because he enjoys embarrassing people  B. There was not enough room between the tables and a bump was inevitable  C. The person was caught up in his conversation and forgot you were there	5 4 3 2 1  5 4 3 2 1  5 4 3 2 1	
<b>14. Telephone situation.</b> You discover that two of your friends have been regularly speaking to each other on the phone but neither of them has rung you for a long time.	A. Your friends have had something important to discuss with each other  B. Your friends see you as unworthy of their time and attention  C. Your friends have condemned you for something you have done	5 4 3 2 1  5 4 3 2 1  5 4 3 2 1	

Scoring Instructions for the Social Situations Questionnaire (SSQ):

The SSQ consists of 14 scenarios. Nine are ostracism related. Five scenarios are filler vignettes that are not ostracism related. They are included in order to reduce the instrument's susceptibility to demand characteristic bias (participants form an interpretation of the instrument's purpose and unconsciously change their behaviour accordingly).

For the ostracism items, each intent attribution is designed to represent one of:

*Punitive ostracism (P)*

*Oblivious ostracism (O)*

*Not ostracism (N)*

SCENARIO	A	B	C
1. Cinema Situation	N	O	P
2 Car			
3 Neighbour Situation	P	N	O
4 Family Party Situation	P	O	N
5 Traffic			
6 Work Situation	N	P	O
7 Break Room Situation	O	P	N
8 DVD Player			
9 Hospital Situation	P	O	N
10 Lunch Situation	O	N	P
11 Ticket			
12 Washroom Situation	P	O	N
13 Restaurant			
14 Telephone Situation	N	O	P

Items 2, 5, 8, 11 and 13 are filler vignettes items.



# Research Volunteers

Would you like to help to improve our understanding of mental health?

Have you a few minutes to spare?

An NHS mental health professional is seeking volunteers to complete some online questionnaires. It doesn't matter whether or not you have experienced problems with your mental health – everybody can make an important contribution and anyone aged 18 or over can take part.

Payment is not offered but you will be entered into a free £250 prize draw.

**To request more information, please email**



### Appendix 3: Consent Form

Link to study Consent Form: <http://www.surveygizmo.com> [REDACTED]



#### CONSENT FORM

Title of Project: "Attitudes, Beliefs, Social Experiences and Mental Health Project."

Please Initial Boxes

1. I confirm that I have read and understood the information sheet date Version 3 (12.3.10) for the above study. I have had the opportunity to consider the information, ask questions and have had these answered satisfactorily. \_\_\_\_\_

2. I understand that my participation is voluntary and that I am free to withdraw at any time without giving any reason.  
\_\_\_\_\_

3. I understand that data collected up to the point of withdrawal will be used in the study. \_\_\_\_\_

4. I have read the prize draw terms and conditions and wish my name to be entered into the draw. \_\_\_\_\_

5. I understand that I will be sent reminders by email to complete the questionnaires. \_\_\_\_\_

6. I understand that once this Consent Form is submitted it can not be altered by the researcher. \_\_\_\_\_

7. I agree to take part in the study \_\_\_\_\_

Date

\_\_\_\_\_

Full name of participant

\_\_\_\_\_

Email Address

\_\_\_\_\_

Name and signature of researcher

=====

Thank you for submitting the Consent Form.

You will shortly be sent a copy of the Consent Form to keep and a link to the research questionnaires.

## Appendix 4: Information Sheets



### **Information Sheet (Time One)** **Attitudes, Beliefs, Social Experiences and Mental Health Project.**

I would like to invite you to participate in a research study. Before you decide whether or not to take part, you need to understand why the research is being done and what it would involve for you. Please take time to read the following information. Please ask (contact details are given at the end of this Information Sheet) if there is anything that is not clear or if you would like more information.

#### ***What is the research about?***

The aim of the research is to explore how attitudes, beliefs and experiences relate to certain aspects of mental health. It is possible that this research may eventually contribute to the development of effective new psychological treatments for certain mental health conditions.

#### ***Why have I been chosen?***

Members of the public aged 18 years and over in various different settings are being invited to take part. It does not matter whether you feel you have or haven't experienced any issues with your mental health.

#### ***How should I decide whether or not to take part?***

If you feel you can spare a few minutes to help, you may wish to decide to take part.

#### ***What will happen if I take part?***

If you decide to take part, you should click on the link to the Consent Form, complete and submit it. You will then be sent a copy of the Consent Form. You will also be sent an identity number and a link which will take you to the online research questionnaires. You will be asked to enter your identity number, email address and Personal Details and then to complete the study questionnaires (you may save them and return to them later if you wish). Once you have completed them, you should click on the submit button. Two weeks later you will be sent a link to the second set of questionnaires to complete and submit. That will complete your participation in the study and you will not be asked to do anything else. The personal details you give will enable the researcher to a) link your Time One and Time Two responses, b) include certain details like age and gender into the analysis and c) contact you for no purposes other than those described in this Information Sheet.

#### ***What are the benefits and disadvantages of taking part?***

Completing the questionnaires will take around half an hour of your time. Your participation will help improve our understanding of certain mental health issues and may eventually contribute to the development of effective new treatments. You may find that some of the questions touch on issues that raise concerns for you regarding your mental health. In this case, you may wish to speak to your G.P. It is hoped that around 160 people will take part and everyone who completes and submits the questionnaires will be entered into a prize draw. Those who submit both Time One and Time Two questionnaires will receive two entries into the draw. One cash prize of £250 will be awarded. \*See terms and conditions for prize draw below.

***What if I have any questions or concerns about taking part in the study?***

If you have any questions or concerns before, during or after your participation in the study, please contact the researcher (contact details given below).

***Will my taking part in this study be kept confidential?***

Yes. Ethical and legal practice will be followed and all information about you will be handled confidentially. Your Personal Details will be kept on a secure password protected website and on an encrypted database which is password-protected so only the researcher will have access to them. They will not be passed on to anyone else for any purpose. Research data (that is, your responses to the study questionnaires) will be kept separate from your Personal Details and coded so only the researcher will be able to link your responses to you. Once the study is complete, all identifiable information and data will be destroyed.

***What will happen if I don't want to carry on?***

You can withdraw at any time by contacting the researcher and you will not be contacted again. However, data collected up to the point of your withdrawal will be used.

***What will happen to the results?***

The results of the study will be written into a thesis and opportunities to publish them in a scientific journal will be sought. You will not be identified in any report/ publication.

***Who has reviewed this study?***

The University of Hull has approved the study as worthwhile and ethical.

***Who to contact for more information about the study or if you have concerns relating to your participation:***

Elaine Middleton, Chartered Clinical Psychologist:

- telephone [REDACTED] or
- email [REDACTED]

If you wish to take part in the study, now click on the link to the Consent Form, complete it and submit it. Once it has been submitted it can not be altered. You will then be sent the link to the study questionnaires.

***Please keep this information sheet for the duration of the study.***

**\* PRIZE DRAW TERMS AND CONDITIONS:** Only participants who have taken part in the study and submitted the questionnaires will be entered into the prize draw. Those participants who submit only Time One questionnaires will have one entry into the draw. Those participants who submit both Time One and Time Two questionnaires will have two entries into the draw. The closing date for entry is 31.1.11. The draw will take place on 1.2.11 and will be witnessed. The first name to be drawn will be awarded a prize of £250 to be paid by cheque to the name provided on the Personal Details Form. The winner will be notified by email and asked to confirm their current address. The email address provided by the participant on the Personal Details Form will be used to contact the winner. Failure to respond in any circumstances to the notification email within three weeks from the date of the notification will result in the prize being offered to the next name drawn.

**Information Sheet (Time Two)**

**Attitudes, Beliefs, Social Experiences and Mental Health Project.**

Thank you very much for completing and submitting the Time One questionnaires relating to the above study.

Now, please click on the link below, enter your Identifier Number and complete and submit the Time Two questionnaires.

[www.surveymzmo.com/s/](http://www.surveymzmo.com/s/) [redacted]

You will be sent email reminders to submit the questionnaires. Once you have completed and submitted the questionnaires, this completes your participation in the study and you will not be asked to do anything else.

**Many thanks for participating in this study. Your help is very much appreciated.**

## Appendix 5: Inter-item correlation matrices for SSQ

Table 10: Inter-Item Correlation Matrix for Punitive Ostracism

	Cinema	Neighbour	Party	Work	Break-room	Hospital	Lunch	Washroom	Telephone
Cinema	1.000	.583	.415	.513	.537	.484	-.423	.496	.524
Neighbour	.583	1.000	.425	.535	.483	.505	-.344	.475	.519
Party	.415	.425	1.000	.455	.470	.476	-.293	.456	.502
Work	.513	.535	.455	1.000	.449	.564	-.353	.552	.558
Breakroom	.537	.483	.470	.449	1.000	.602	-.378	.635	.552
Hospital	.484	.505	.476	.564	.602	1.000	-.333	.605	.593
Lunch	-.423	-.344	-.293	-.353	-.378	-.333	1.000	-.487	-.523
Washroom	.496	.475	.456	.552	.635	.605	-.487	1.000	.735
Telephone	.524	.519	.502	.558	.552	.593	-.523	.735	1.000

Table 11: Inter-Item Correlation Matrix for Oblivious Ostracism

	Cinema	Neighbour	Party	Work	Breakroom	Hospital	Lunch	Washroom	Telephone
Cinema	1.000	.567	.398	.310	.510	.029	-.213	.412	.424
Neighbour	.567	1.000	.476	.408	.497	.051	-.271	.462	.585
Party	.398	.476	1.000	.415	.547	.102	-.313	.579	.547
Work	.310	.408	.415	1.000	.435	.007	-.312	.368	.504
Breakroom	.510	.497	.547	.435	1.000	.014	-.352	.598	.553
Hospital	.029	.051	.102	.007	.014	1.000	.038	.114	-.025
Lunch	-.213	-.271	-.313	-.312	-.352	.038	1.000	-.374	-.459
Washroom	.412	.462	.579	.368	.598	.114	-.374	1.000	.551
Telephone	.424	.585	.547	.504	.553	-.025	-.459	.551	1.000

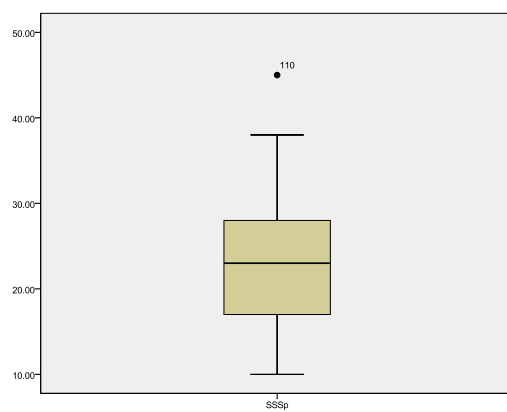
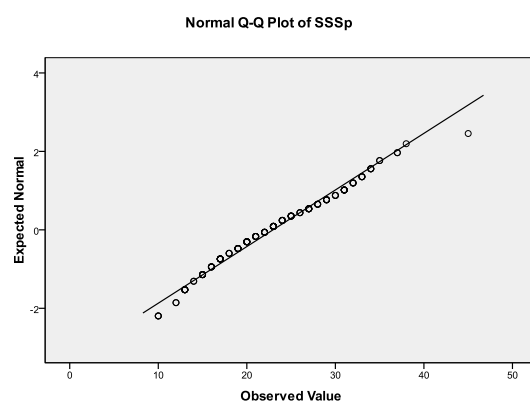
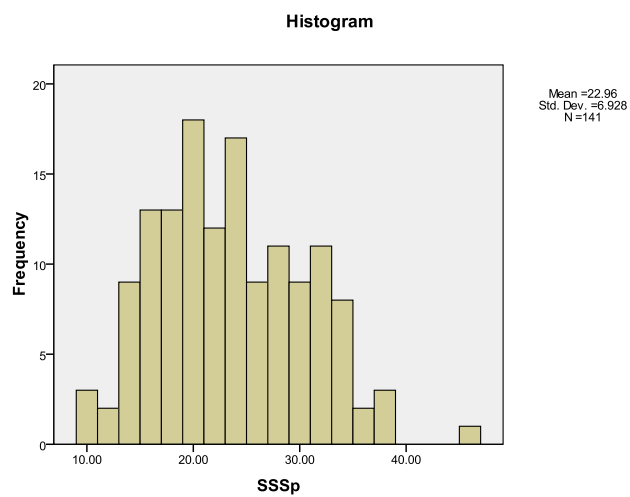
Table 12. Inter-Item Correlation Matrix for Not Ostracism

	Cinema	Neighbour	Party	Work	Breakroom	Hospital	Lunch	Washroom	Telephone
Cinema	1.000	.218	.058	.036	.082	.027	-.048	.016	.019
Neighbour	.218	1.000	.335	.276	.216	.211	-.148	.221	.247
Party	.058	.335	1.000	.429	.235	.297	-.143	.358	.221
Work	.036	.276	.429	1.000	.207	.361	-.083	.399	.428
Breakroom	.082	.216	.235	.207	1.000	.174	-.176	.401	.238
Hospital	-.027	.211	.297	.361	.174	1.000	-.244	.314	.390
Lunch	.048	-.148	-.143	-.083	-.176	-.224	1.000	-.060	-.110
Washroom	.019	.299	.344	.339	.374	.284	-.120	1.000	.312
Telephone	.018	.247	.221	.428	.238	.390	-.110	.334	1.000

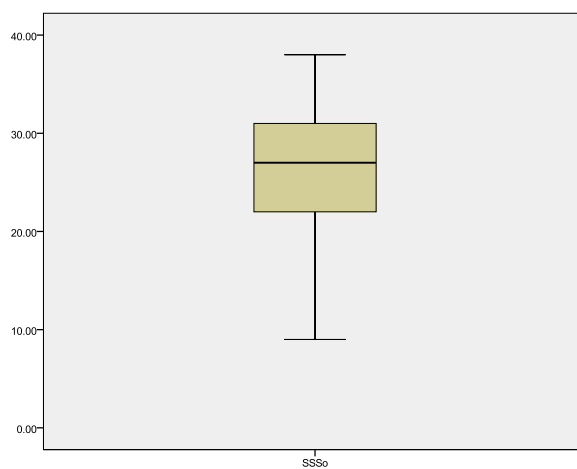
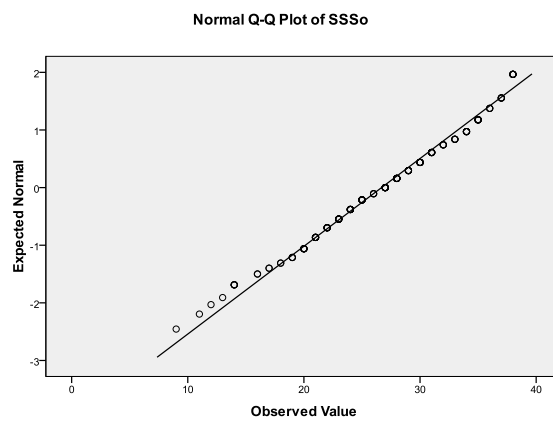
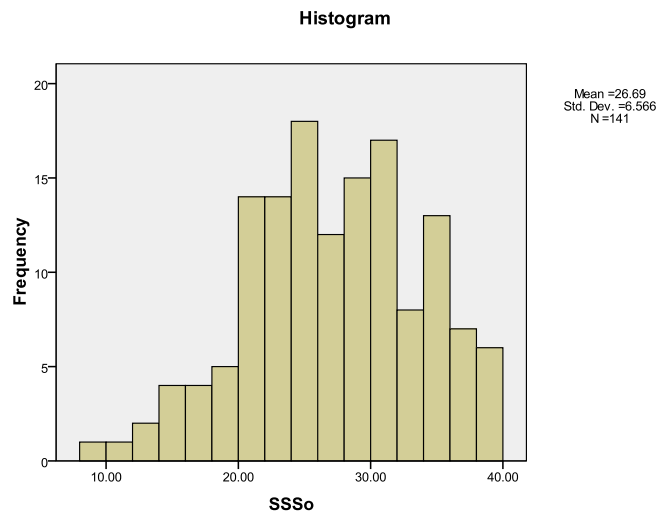


## Appendix 6: Normality plots for SSQ

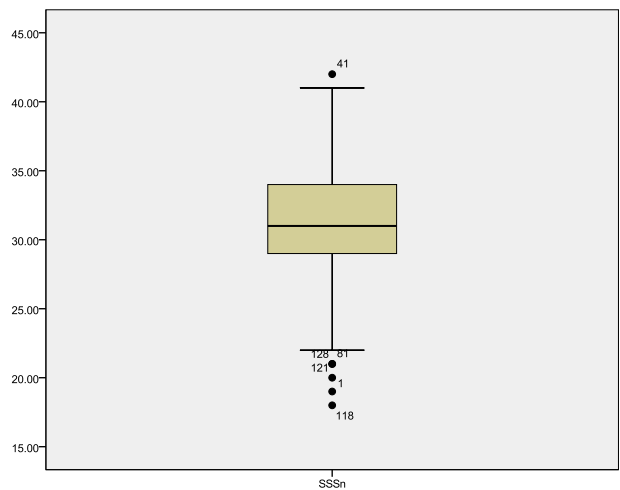
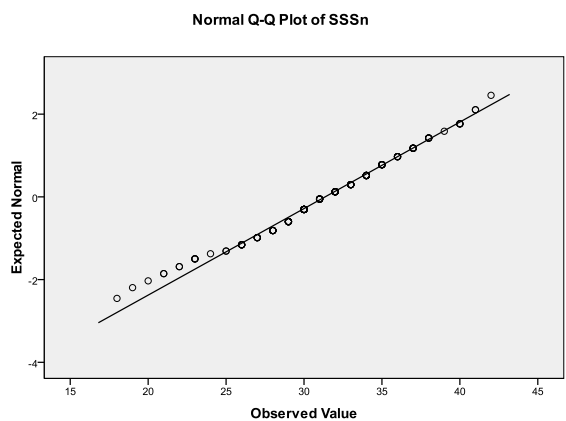
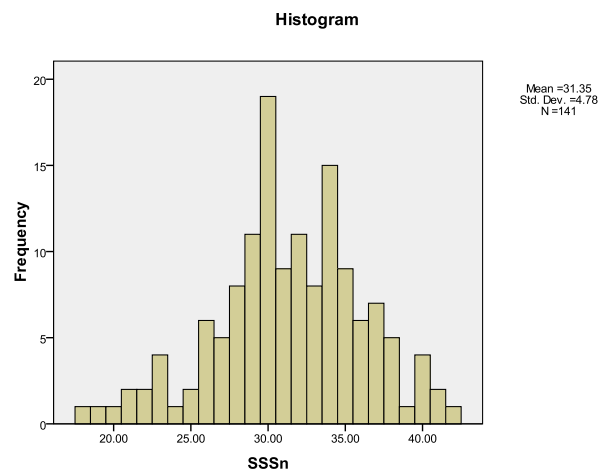
### *1. Punitive Intent Attributions*



## 2. Oblivious Intent Attributions



3. Not ostracism Intent Attributions



Appendix 7: Regression models of POE variables on Obsessive Beliefs factors:

zero order, partial and part correlations

Table 13: Responsibility/Threat Model

Model	Correlations			
	% contribution Zero-order (from R <sup>2</sup> )		% contribution Partial (from R <sup>2</sup> )	
1 (Constant)				
HFS	.605	37%	.401	16%
PCSt	.421	18%	.145	2%
SSQp	.529	28%	.286	8%

Dependent Variable: R/T

Table 14: Perfectionism/Certainty Model

Model	Correlations			
	% contribution Zero-order (from R <sup>2</sup> )		% contribution Partial (from R <sup>2</sup> )	
1 (Constant)				
HFS	.629	40%	.467	16%
PCSt	.402	16%	.123	1.5%
SSQp	.460	21%	.173	3%

Dependent Variable: P/C

Table 15: Importance/Control of Thoughts

Model	Correlations			
	% contribution Zero-order (from R <sup>2</sup> )		% contribution Partial (from R <sup>2</sup> )	
1 (Constant)				
HFS	.619	38%	.420	18%
PCSt	.416	17%	.128	1.6%
SSQp	.541	29%	.301	9%

Dependent Variable: I/CT

Appendix 8: Regressions of maternal, paternal and peer psychological control  
on independent and dependent variables

Table 16: Psychological control scales regressed on OC symptoms

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.22	.47		.47	.64
PCS mother	.23	.09	.15	2.47	.01
PCS father	.13	.10	.08	1.34	.18
PCS peers	.51	.10	.29	5.32	.00

Dependent Variable: OCI-R  $R^2 = .173$   $F(3,326)=22.69$

Table 16 Psychological control scales regressed on OBQ-44

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	6.65	.60		11.15	.00
PCS mother	.49	.12	.24	4.09	.00
PCS father	.09	.12	.04	.71	.48
PCS peers	.74	.12	.32	6.13	.00

Dependent Variable: OBQ-44  $R^2 = .235$   $F(2,326)=33.44$