An Examination of the Theoretical Pathways Proposed by Young's Schema Therapy Model in Relation to Social Anxiety

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Summary

Despite the wide-spread clinical use of schema therapy to treat various disorders, including chronic anxiety, limited research has examined the pathways theorised by Young's schema model or its viability when treating individuals with social anxiety and social anxiety disorder (SAD). This thesis therefore presents four papers designed to assess the roles of culture, negative parenting practices, temperament, coping styles and the unconscious processing of threatening information in the aetiology of early maladaptive schemas (EMS) and social anxiety. The first study revealed that Chinese (n = 118), Chinese-Australian (n = 120) and Australian (n = 163) students experiencing higher social anxiety symptomatology display higher levels of EMS from Young's (1999) schema theory related to domain 1: *Disconnection and Rejection* as well as domain 2: *Impaired Autonomy and Performance*. Using the same samples, the second study identified EMS as potential partial mediators of the relationship between perceived negative parenting practices (i.e. rejecting and overprotective parenting) and social anxiety, although important cross-cultural differences were identified. The results of the third study involving 360 Australian students indicated that temperament may influence the type of coping style/s some individuals adopt, with more introverted individuals utilising more avoidant strategies, while neuroticism appears to have a stronger relationship with *Disconnection and Rejection* schemas than coping styles such as avoidance or overcompensation. Finally, the results of the fourth study involving 89 Australian students revealed that there were no significant differences in state social anxiety when comparing groups who received a subliminal *Disconnection and Rejection* ("Mummy does not love me"), counter-schematic ("Mummy does love me") or neutral ("Mummy is walking") cue, however there was a trend in the predicted direction when examining a group who scored high on the *Social Interaction Anxiety Scale* (SIAS). The role of avoidance was also explored given its relationship with social anxiety. The implications of the findings from each study for both schema therapy theory and treatment concerning social anxiety and SAD are discussed, along with directions for future research.

Certification by Candidate

I certify that this thesis has not been previously submitted for a degree nor has it been submitted as part of the requirements for a degree to any other university or institution other than Macquarie University. I also certify that this thesis is an original piece of research and that it has been written by me. Approval for all aspects of the research presented in this thesis was obtained from the Macquarie University Human Research Ethics Committee (reference numbers: 5201100391, 5201200106 and 5201200527).

Kathleen Mairet (40724778)

Date:

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Chapter 1

General Introduction

Thesis Overview

Despite the increasing popularity of schema therapy in clinical practice, many of the theoretical pathways on which it is based have remained largely untested in clinical research. For instance, although Young, Klosko and Weishaar (2003) propose that schema therapy has "proven useful" (p. 6) in treating chronic anxiety, limited research has explored the theoretical pathways proposed by the schema model in relation to the anxiety disorders, particularly social anxiety and social anxiety disorder (SAD). In addition, the clinical application of Young's (1990; 1999a) theory has been far less examined in terms of social anxiety and SAD than for other disorders such as Borderline Personality Disorder and eating disorders.

Although traditional cognitive behavioural therapy (CBT) is currently considered the most effective form of therapy for individuals with social anxiety and SAD, research suggests that certain clients do not improve or drop-out of treatment (Bados, Balaguer, & Saldaña, 2007; Eskildsen, Hougaard, & Roseberg, 2010; Issakidis & Andrews, 2004). A possible explanation for this might be that some clients have persistent maladaptive schemas about themselves or the world which may not be adequately addressed during time-limited traditional CBT. More specifically, research suggests that adults who score more highly on social anxiety symptomatology display greater maladaptive schemas related to Young's (1990; 1999a) domain of *Disconnection and Rejection* (i.e. the belief that one's needs for love, stability, safety and belonging will not be met in a predictable manner).

Although recent research has explored the schematic structure associated with social anxiety in adults (e.g., Calvete & Orue, 2008; Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006) and adolescents (e.g., Calvete, Orue, & Hankin, 2014; Orue, Calvete, & Padilla, 2014), the aim of this thesis is to examine additional theoretical pathways proposed by Young et al. (2003) concerning factors that have been proposed to be important in the aetiology of maladaptive schemas including culture, perceived parenting, temperament, coping styles and

unconscious processes.[1] Identification of factors which are associated with maladaptive schemas and social anxiety, including how they are theoretically related, is likely to have implications for both the assessment and treatment of social anxiety and SAD.

Prior to outlining the four papers contained in this thesis, a background literature review is provided. The literature review commences with an overview of schema therapy, social anxiety and SAD, and then related schema therapy theory. This is followed by a review of the extant literature examining the association between Young's maladaptive schemas and social anxiety. Next, attention is given to each of the aforementioned factors and how they relate to Young's schema therapy theory. Given the paucity of schema related studies in this area, relevant literature on social anxiety and SAD will be used to inform the direction of the four studies in this thesis. Chapter 1 concludes with a description of the four studies offered in the subsequent chapters of this thesis. [2]

Briefly, Study 1 (Chapter 2) investigates whether cross-cultural differences in Young's maladaptive schema domains exist both independent of social anxiety as well as in relation to social anxiety symptomatology. A secondary aim of this study is to examine whether a significant life event (i.e. moving to a foreign country) possibly alters participants' maladaptive schemas. Studies 1 and 2 comprise of three samples including an Australian sample, a Chinese sample residing in Australia and a Chinese sample residing in Hong Kong. The schema domains associated with social anxiety (i.e. *Disconnection and Rejection* as well as *Impaired Autonomy and Performance*) in Study 1 (Chapter 2) are then further explored in Study 2 (Chapter 3). Given the proposed relationship between negative parenting practices, maladaptive schemas and psychopathologies, Study 2 examines whether maladaptive schemas

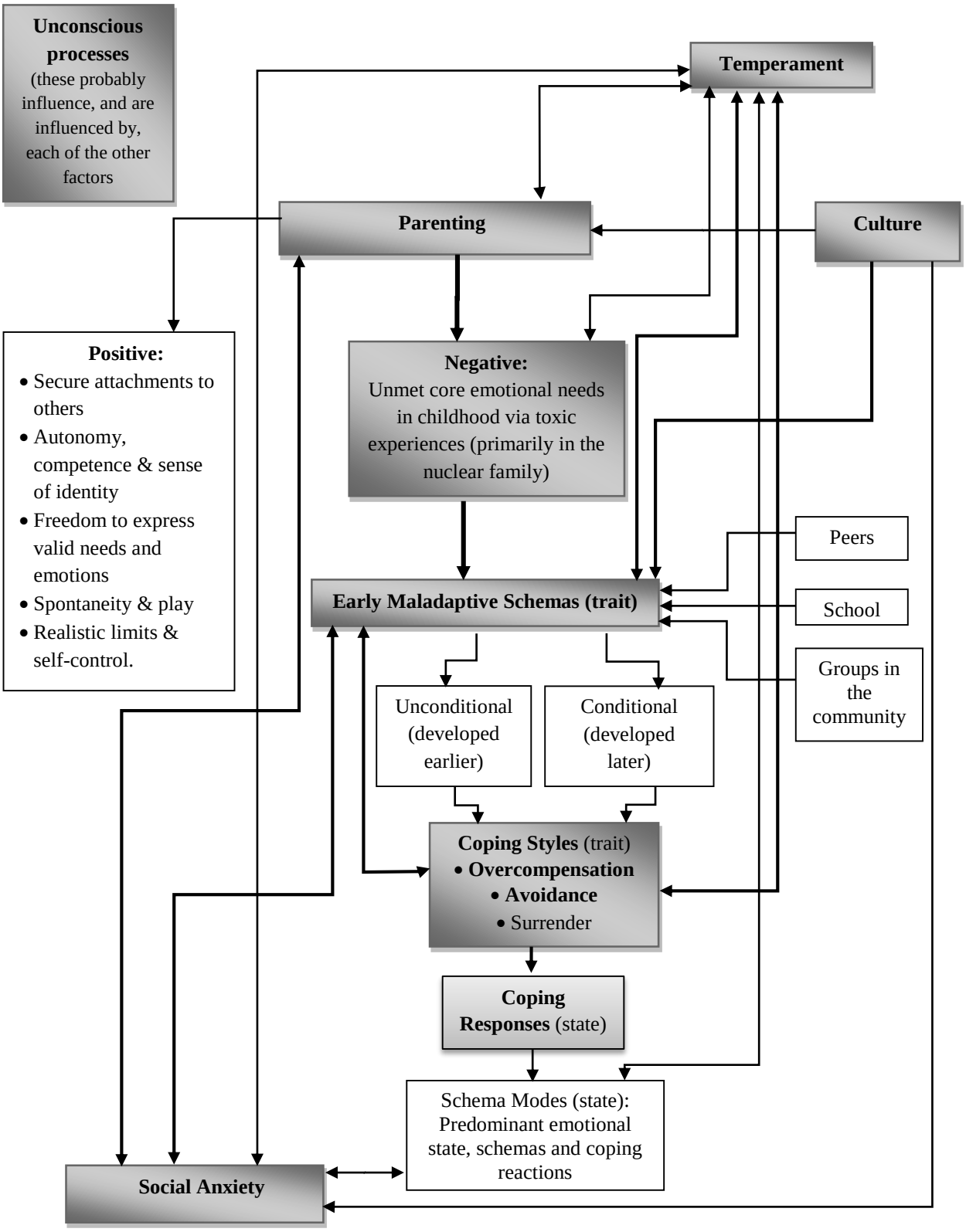
[1] Please refer to the Conceptual Model on page 5 for an overview of the primary theoretical pathways proposed by schema therapy theory.

[2] This thesis is presented as a non-traditional research thesis by publication format as outlined by Macquarie University Higher Degree Research Unit. This format necessitates the preparation of papers, which may be submitted by publication. The thesis comprises of six chapters consisting of four individual papers prepared for publication and an overall introduction and discussion. As a result, this structure necessitates some repetition across chapters.

mediate the relationship between perceived negative parenting practices (i.e. cold or rejecting and overprotective) and social anxiety.

In Study 3 (Chapter 4), the relationship between temperament, coping styles, EMS (i.e. *Disconnection and Rejection* schemas) and social anxiety will be explored using path analysis. Finally, Study 4 (Chapter 5) will examine Young et al.'s (2003) supposition that schemas can operate pre-consciously by drawing upon Beck and Clark's (1997) revised schema-based information processing model of anxiety. The final chapter (Chapter 6) provides an overview of the key findings and implications of this research. It also includes strengths and weaknesses of the thesis and offers suggestions for future research.

Conceptual Model of the Primary Theoretical Pathways Proposed by Schema Therapy [3]



[3] *Note*. This is a simplified conceptual model used for illustrative purposes. This thesis will pay particular attention to the highlighted variables in the above model. Although it is acknowledged that positive parenting practices inter-relate with many of the factors, and that early adaptive schemas exist, these are not to focus of this thesis and therefore have not been elaborated upon in this figure.

Schema Therapy

Schema therapy is an integrative therapy developed by Young and colleagues (Young, 1990; 1999; Young, Klosko, & Weishaar, 2003), combining elements of traditional cognitive-behavioural, psychoanalytic, Gestalt, attachment, constructivist and object relations therapies. Schema therapy was designed to treat entrenched and chronic aspects of Axis I and II psychological and/or characterological problems (Young et al., 2003[4]). Consequently, once acute symptoms have been addressed (e.g., severe major depression), Young et al. (2003) believe that schema therapy could be valuable when treating clients with a variety of presenting problems, including difficult couple problems, personality disorders, eating disorders, as well as those with chronic depression and/or anxiety.

Depending upon the pervasiveness and chronicity of the individual's presenting problem/s, schema therapy can be brief, intermediate or long term (Young et al., 2003). Although schema therapy is considered an extension of traditional cognitive behavioural therapy (CBT), schema therapy places a greater emphasis on: (i) exploring the childhood and adolescent origins of psychological problems; (ii) employing experiential or affect-based techniques, (iii) focusing upon the maladaptive coping styles that are utilised by the individual to cope with underlying maladaptive patterns or beliefs; and (iv) the therapeutic relationship (Young et al., 2003). According to Young et al. (2003), schema therapy treatment is comprised of two phases. Following the "Assessment and Education Phase", where therapists help clients to identify and understand the origins of their maladaptive schemas and coping strategies, schema therapists then utilise various techniques during the "Change Phase" depending on the client's individual needs (Young et al., 2003). These include cognitive techniques (e.g., cognitive restructuring), experiential techniques (e.g., imagery tasks), behavioural pattern-breaking (e.g., learning how to replace maladaptive coping responses

[4] As this thesis was prepared in a non-traditional thesis by publication format, 'et al.' is used to indicate the remaining authors on repeat citations within each chapter, rather than across the thesis as a whole.

with new, more adaptive patterns of behaviour) and via the therapist-client relationship (e.g., *limited reparenting* which is supplying clients, within certain boundaries, with what they needed but did not receive from their parents during childhood, such as a nurturing atmosphere) (Young et al., 2003).

Schema therapy has received the most recognition and support as a form of therapy for personality disorders, primarily Borderline Personality Disorder (BPD) (Rafaeli, Bernstein, & Young, 2010). While increasing research has begun to explore the utility of schema therapy theory and treatment when treating individuals with eating disorders (e.g., Waller, Kennerley, & Ohanian, 2007) and depression (e.g., Halvorsen, Wang, Eisemann, & Waterloo, 2010; Renner, Arntz, Leeuw, & Huibers, 2013), considerably less research has focused upon the anxiety disorders, particularly social anxiety and social anxiety disorder (SAD). This is despite (i) the lifetime prevalence of social anxiety and SAD (7-13%; Furmark, 2002) being considerably higher than BPD (2%; Leichsenring et al., 2011), (ii) evidence that individuals with social anxiety and SAD display higher levels of maladaptive schemas than non-clinical samples, and (ii) the application of schema therapy to treat social anxiety and SAD in clinical settings (Young et al., 2003).

Social Anxiety and Social Anxiety Disorder

Individuals with social anxiety fear negative evaluation by others. Although social anxiety is a relatively common human experience, when this fear becomes severe or disabling it may reach diagnostic criteria for social anxiety disorder (SAD), also known as social phobia (American Psychiatric Association [APA], 2013). Consequently, interactional situations, such as meetings, parties and social gatherings, can be problematic while performance situations, such as speaking, eating or writing in public, are often feared or avoided (Furmark, 2002).

Recent research suggests that SAD is the third most prevalent psychiatric disorder in Western cultures and the most common anxiety disorder in the general population (Brook & Schmidt, 2008), with a lifetime prevalence of approximately 7-13% in Western countries (Furmark, 2002). Research suggests that there is a higher incidence of social anxiety and SAD

in both girls and adult women compared to boys and men (Furmark, 2002). Whereas social anxiety is commonly observed in children, SAD typically begins between early and late adolescence (e.g., Amies, Gelder, & Shaw, 1983) and can have a fairly stable course across the lifespan if left untreated (Furmark, 2002). Social anxiety and SAD are associated with lower quality of life due to impairments in numerous domains, including social, academic and occupational functioning (Furmark, 2002). For instance, individuals with social anxiety and SAD are more likely to be unemployed, absent from work, or display reduced work productivity (see Greenberg et al., 1999). Social anxiety and SAD have also been identified as risk factors for comorbid psychological problems, such as depression and substance abuse (Fehm & Wittchen, 2004). In light of these findings, social anxiety and SAD have been recognised as significant public health problems due to their association with individual suffering as well as considerable societal costs (Greenberg et al., 1999).

The treatment of social anxiety and SAD. While traditional CBT is currently considered the most effective form of non-pharmacologic intervention for individuals experiencing social anxiety and SAD, drop-out rates typically range from 10-20% (Bados, Balaguer, & Saldaña, 2007; Eskildsen, Hougaard, & Roseberg, 2010; Issakidis & Andrews, 2004). Moreover, some clients who do remain in therapy do not show improvements or relapse following treatment (Eskildsen et al., 2010). Young et al. (2003) propose numerous reasons as to why certain clients experiencing chronic and/or pervasive psychological problems, including social anxiety and SAD, may not improve or drop out of treatment. First, some individuals may lack specific Axis I symptoms to serve as targets in therapy or, if they do, their problems might be too vague to define. Alternatively, the individual may have so many Axis I symptoms that traditional CBT is difficult to apply or may not fit the limited number of treatment sessions. This is particularly relevant to social anxiety and SAD given the high comorbidity rates with other affective disorders (Fehm & Wittchen, 2004). Third, individuals may relapse following treatment due to rigid and pervasive maladaptive beliefs or patterns (i.e. schemas). For example, an individual experiencing social anxiety or SAD might

have experienced a lifetime of feeling as though one is defective (defectiveness/unlovability schema), that they will inevitably fail (failure to achieve schema) and lack social support (social isolation/alienation schema), which may contribute to the risk of relapsing.

Young et al. (2003) also argue that traditional CBT assumes that individuals are able to access and report upon both their cognitions as well as emotions in a limited number of sessions. Nevertheless, many people with chronic psychological problems will avoid thoughts, memories or behaviours that need to be accessed in order to progress in treatment. Notably, avoidance of threatening thoughts, emotions and social situations are part of the diagnostic criteria for social anxiety and SAD (APA, 2013). Finally, Young et al. (2003) assert that traditional CBT assumes that individuals with chronic or pervasive psychological problems can easily form a safe, trusting and collaborative relationship with their therapist after a few sessions. However, the difficulty, or inability, for some clients to form a collaborative relationship can be the major problem in therapy. For instance, certain clients with social anxiety or SAD might be overly concerned with what a therapist thinks of them or may fall into despair due to feelings of abandonment at the conclusion of treatment.

In summary, although traditional CBT is considered the most effective form of therapy for social anxiety and SAD, Young et al. (2003) suggest schema therapy might be clinically useful when treating individuals who do not improve during the course of treatment or relapse following therapy. However, despite the increasing popularity of schema therapy in clinical settings, limited research has been carried out on the pathways theorised by Young's schema model or its viability when treating individuals with social anxiety or SAD. As a result, large gaps in the literature concerning social anxiety and SAD exist, including (i) whether schema therapy theory and treatment is viable cross-culturally, (ii) the parenting styles that give rise to certain maladaptive schemas, (iii) temperament and coping variables associated with certain schemas, and (iv) whether or not schemas are processed pre-consciously.

Schema Therapy Theory

Schemas. Central to schema therapy is the concept of schemas. Since ancient Greek philosophy, the term "schema" has generally referred to a framework, structure or outline. In extending Beck's (1967) conceptualisation of schemas (i.e. any broad organising principle used to make sense of one's self, world and others), Young (1990; 1999a) hypothesised that maladaptive schemas primarily develop as a result of 'toxic' childhood experiences. Young et al. (2003) propose four types of negative childhood experiences that contribute to the acquisition of maladaptive schemas (i) *toxic frustration of needs* (i.e. when a child receives too little of something important, such as love or stability), (ii) *traumatisation or victimisation* (i.e. when a child is harmed or victimised), (iii) when a child receives too much of something (e.g., when a child is indulged so they lack internal limits), and finally, (iv) *selective internalisation or identification with significant others* (i.e. when a child internalises a parent's thoughts, feelings and/or behaviours). Young et al. (2003) define *early maladaptive schemas* (EMS) as broad, pervasive dysfunctional beliefs concerning oneself and one's relationship with others that develop during childhood and are elaborated upon throughout one's life. Hence, Young et al.'s (2003) definition of schemas retains the information processing component of Beck's (1967) description, however it emphasises their thematic content and early onset (Riso et al. 2006).

Young and colleagues (Young, 1999a; Young et al., 2003) propose that EMS primarily result from the frustration of universal core emotional needs, including the need for (i) secure attachments to others, (ii) autonomy, competence and a sense of identity, (iii) freedom to express valid needs and emotions, (iv) spontaneity and play, and (v) realistic limits and self-control. Although Young et al. (2003) claim that EMS never disappear altogether, they suggest that maladaptive schemas can be "healed" via schema-focused therapy. Therefore, the primary aim of schema therapy is to diminish (i) the intensity of memories associated with the EMS, (ii) the strength of the bodily reactions to EMS, (iii) the emotional charge associated with the EMS, and (iv) maladaptive cognitions associated with underlying EMS (Young et al.,

2003). While Young et al. (2003) propose that both maladaptive and adaptive schemas exist, schema therapy assessment and treatment almost exclusively focuses on maladaptive schemas.

Early Maladaptive Schemas and their associated domains. Based on clinical experience, Young (1990; 1999a) proposed 18 EMS that fall into five broad categories or "schema domains" according to the aforementioned core emotional needs that were not satisfactorily met in childhood. These domains include *Disconnection and Rejection*, *Impaired Autonomy and Performance*, *Impaired Limits*, *Other-directedness* and *Overvigilance and Inhibition*. The *Disconnection and Rejection* domain includes schemas involving the expectation that one's needs for stability, safety, nurturance, love and acceptance will not be met in a predictable manner. Individuals with these schemas often have difficulty forming secure, satisfying attachments to others. Young et al. (2003) believe that the corresponding typical family origin is an environment that is detached, cold, rejecting, lonely, explosive, unpredictable or abusive. Schemas within the *Impaired Autonomy and Performance* domain concern the expectation about oneself and the environment that will interfere with their perceived capacity to perform successfully and function independently. In this case, Young et al. (2003) propose that the typical family of origin is enmeshed, overprotective, and fails to reinforce the child for performing competently outside the family. Schemas within the *Impaired Limits* domain are associated with a deficiency in internal limits, responsibility to others, or long-term goal-orientation. Young et al. (2003) consider the typical family origin is characterised by permissiveness, overindulgence, and/or a sense of superiority.

Individuals with EMS related to the *Other-directedness* domain are believed to display an excessive focus on the desires, feelings, and responses of others at the expense of one's own needs. Young et al. (2003) suggest that the typical family origin is based on conditional acceptance whereby children must supress important aspects of their own needs to gain attention, love and approval. Schemas within the *Overvigilance and Inhibition* domain

involve the excessive emphasis on supressing one's spontaneous feelings, impulses, and choices or on meeting rigid, internalised rules and expectations about performance and ethical behaviour. Young et al. (2003) propose that the typical family of origin is demanding, sometimes punitive and/or with some pessimism and worry.[5]

The link between EMS and social anxiety/ SAD. Theory and research suggest that there is a link between EMS and psychiatric symptomatology. For instance, a study by Welburn, Coristine, Dagg, Pontefract, and Jordan (2002) revealed that, while *abandonment* and *insufficient self-control* EMS were related to depression, *vulnerability to harm*, *abandonment*, *failure*, *self-sacrifice*, and *emotional inhibition* predicted anxiety. Compared to other psychological disorders, such as depression (e.g., Halvorsen et al., 2010), eating disorders (e.g., Jones, Harris, & Leung, 2005) and personality disorders, particularly BPD (see Sempértegui, Karreman, Arntz, & Bekker, 2013 for a review), very little research has directly explored the schematic structure of individuals experiencing social anxiety and SAD. Nevertheless, this section commences with a literature review on what is presently known about the association between EMS and social anxiety or SAD.[6]

In a study examining the EMS associated with social anxiety and agoraphobia in individuals with eating disorders, Hinrichsen, Waller, and Emanuelli (2004) revealed that females with eating disorders with high levels of comorbid social anxiety have higher *abandonment* and *emotional inhibition* EMS. These findings suggest that females with eating disorders and comorbid social anxiety appear to fear that significant others may leave them and that they need to hide their true feelings in order to avoid being disapproved of by others. In a related study, Hinrichsen, Waller, and Dhokia (2007) found that females with eating disorders and high levels of comorbid social anxiety report higher levels of *abandonment* and *defectiveness/shame* EMS. Thus, in addition to holding a fear that significant others may

[5] Please see Appendix A for a full list of schema domains and the related subscales.
[6] Please note that the majority of the studies within this thesis were conducted prior to 2014. As such, the General Introduction contains research pertaining to research carried out following this which may not have been included in the individual papers.

leave them (i.e. *abandonment*), these findings suggest that females with an eating disorder and comorbid social anxiety feel as though they are inherently flawed in some way (i.e. *defectiveness/shame*), which may make them feel more susceptible to being abandoned. While these studies are considered important steps in determining the schematic structure underlying social anxiety, future studies were necessary given that these samples were limited to females with comorbid eating disorders.

A small number of studies have specifically examined EMS in samples of participants with social anxiety and SAD. Pinto-Gouveia, Castilho, Galhardo, and Cunha (2006) compared the EMS associated with SAD, other anxiety disorders (including obsessive-compulsive disorder and panic disorder), and non-psychiatric controls. The results of this study revealed that individuals with SAD display higher levels of all EMS compared to controls except *unrelenting standards/hypercriticalness*, and were higher than the mixed anxiety group on *social isolation, defectiveness/shame, failure, social underisability/defectiveness, subjugation, dependence, emotional deprivation* and *mistrust/abuse*. As a result, Pinto-Gouveia et al. (2006) concluded that individuals with SAD show higher levels of EMS, particularly related to the domain of *Disconnection and Rejection*.

Notable contributions to this area of research have been made by Calvete and colleagues. For example, in a large cross-sectional study involving university students, Calvete and Orue (2008) revealed that social anxiety is primarily associated with *abandonment, failure,* and *emotional inhibition* EMS. These findings suggest that individuals with social anxiety have a fear that significant others may leave them, that they will inevitably fail and/or that they are inadequate in some way and need to hide their true feelings in order to avoid disapproval by others. Given that the onset of social anxiety typically begins in adolescence, Calvete and colleagues extended the extant research by conducting several cross-sectional and longitudinal studies using large samples from Spain. These studies have examined the relationships between (i) EMS, anxious automatic thoughts and social anxiety

(Calvete, Orue, & Hankin, 2013), (ii) emotional abuse, EMS and social anxiety (Calvete, 2014), (iii) EMS, stressors and social anxiety (Calvete, Orue, & Hankin, 2014) as well as (iv) EMS, brooding rumination and social anxiety (Orue, Calvete, & Padilla, 2014).

While some of these studies have confirmed the importance of schemas related to *Disconnection and Rejection* in the aetiology of social anxiety (e.g., Calvete et al., 2013; Calvete et al., 2014), the authors also found a relationship with schemas associated with *Impaired Autonomy and Performance* (e.g., Calvete et al., 2014), as well as *Other-directedness* (e.g., Calvete et al., 2013; Calvete, 2014; Calvete et al., 2014; Orue et al., 2014). For instance, the results of a large longitudinal study carried out by Calvete et al. (2014) revealed that, although there does not appear to be any consistent or significant interactions between EMS and stressors (e.g., social and performance-related) in predicting symptoms, the domains of *Disconnection and Rejection*, *Impaired Autonomy and Performance* as well as *Other-directedness* were associated with both social anxiety and depression in adolescents. As stated by the authors, this finding may partially explain the high comorbidity between these two affective disorders.

The role of the aforementioned domains in the aetiology of social anxiety make theoretical sense given that the *Disconnection and Rejection* domain involves schemas, such as *social isolation, defectiveness/shame* and *abandonment*, which are consistent with cognitions associated with social anxiety, including the belief that one is flawed or defective so others may abandon them, leaving them feeling socially isolated (Olfson et al., 2000). On the other hand, the *Impaired Autonomy and Performance* domain includes schemas such as *failure to achieve* and *practical incompetence*/*dependence* which is consistent with the belief held by many individuals with social anxiety that they are less competent and capable than others (Jain & Sudhir, 2010). Finally, the domain of *Other-directedness* involves excessive focus on the desires, feelings, and responses of others, at the expense of one's own needs to avoid negative evaluation by others. As mentioned by Calvete et al. (2014), it is worthwhile noting that results pertaining to the *Other-directedness* domain might have been higher in

related studies for several reasons. First, the samples consisted of adolescents. Therefore, EMS related to the *Other-directedness* domain, such as *subjugation* and *approval seeking*, might have been considerably higher given adolescence is a time when individuals may hold a strong need for approval and surrender control to peers in order to avoid rejection.

While these findings have important implications for schema therapy theory and treatment, it is hoped that the present thesis can extend upon our current understanding of the origins of EMS. Although considerable research into the aetiology of social anxiety and SAD exists (see Hudson & Rapee, 2000 for a review), limited research has examined those findings in relation to the aetiology of EMS. As such, the following sections will (i) outline how certain factors (i.e. culture, parenting, temperament, coping strategies and the unconscious processing of threatening information) relate to both EMS and social anxiety and (ii) then will review relevant literature specifically related to social anxiety and SAD which will be used to inform the direction of the four studies contained in this thesis.

The aetiology of EMS and social anxiety

Similar to the major theories addressing the origins of social anxiety and SAD (e.g., Hudson & Rapee, 2000; Rapee & Spence, 2004), Young et al. (2003) propose four areas which contribute to the development and maintenance of EMS, including genetic and temperament factors, parent-child interactions, cognitive aspects, and environmental factors (e.g., cultural influences).

Culture

Definition of culture. As noted by Cohen (2009), there are many forms of culture (e.g., socioeconomic, religious or region within a country) which makes defining this complex construct difficult. Despite the multitude of definitions presented over the years, it is generally agreed that culture (i) emerges from interactions between humans and environments, (ii) is transmitted across time and, (iii) consists of shared elements (Triandis, 2007). Therefore, for the purposes of this thesis, culture will be defined as "...a socially transmitted or socially constructed constellation consisting of such things as practices, competencies, ideas, schemas,

symbols, values, norms, institutions, goals, constitutive rules, artefacts, and modifications of the physical environment" (Fiske, 2002, p. 85).

Culture and EMS. Although Young et al. (2003) identify culture as a factor that contributes to the development of EMS, particularly as a child matures, limited research has investigated whether cross-cultural differences in EMS exist, with no studies to the authors' knowledge directly addressing this question in relation to social anxiety or SAD. This is unfortunate given that (i) certain EMS may be culture specific and (ii) a central tenet of schema theory is the proposition that EMS primarily result from the frustration of *universal* core emotional needs (e.g., secure attachments and autonomy). While this may be true, further research is needed to identify the relationship between particular unmet needs and certain types, or degrees, of EMS in disparate cultures.

Although little to no research has directly been carried out on how culture influences the EMS associated with social anxiety and SAD (i.e. by comparing disparate cultures), several studies have been undertaken to establish the reliability and validity of inventories related to EMS, such as the *Young Schema Questionnaire* (YSQ), in non-Western countries and/or in different languages (e.g., Baranoff, Oei, Cho, & Kwon, 2006; Calvete, Estévez, López de Arroyabe, & Ruiz, 2005). In one such study, Cui, Lin and Oei (2011) examined the cross-cultural differences in the psychometric and factor structure of the YSQ-Short Form in a sample of 712 Chinese undergraduate students. While the results of this study suggested that 14, as opposed to 16, factors (the YSQ-S2 has 16 subscales while the revised YSQ-S3 has 18) were a better fit for the data, and certain subscales, such as *subjugation*, may not be as reliable, the authors concluded that the structure of the YSQ-SF is generalisable to Chinese samples. Moreover Cui et al.'s (2011) study revealed the predictive validity of the YSQ-SF in Chinese undergraduate students with schemas related to *emotional deprivation*, *dependence/incompetence* and *self-sacrifice* predicting depression, while *mistrust/abuse* and *vulnerability to harm or illness* predicting anxiety. The results of this study therefore suggest

that the structure of the YSQ-SF may be generalisable to and have predictive validity in certain non-Western cultures, in this case Chinese.

Culture and social anxiety/SAD. Cross-cultural research indicates that social anxiety and SAD exist in cultures strikingly different to Western cultures (Scheier et al., 2010). Cross-cultural research into social anxiety and SAD, however, also remains in its early stages with the vast majority of studies having been conducted in Western countries making the generalisability of the findings difficult. Although various frameworks have been drawn upon to distinguish certain cultures, the most frequently applied dimension involves that of *individualism* and *collectivism*[7]. Whereas collectivistic cultures, such as those of East Asia, tend to promote an interdependent self-construal which emphasises social harmony, reticence and deference to parents as well as a shared sense of identity, individualistic cultures, such as the United States and Australia, tend to emphasise personal goals, uniqueness and control (Singelis, 1994). The distinction between individualistic and collectivistic cultures has been used to explain cultural variations in both the expression of social anxiety and SAD as well as the situations in which they are elicited. For example, *Taijin Kyofusho* (TKS) is an expression of SAD which has been identified in Korean and Japanese cultures (Hofmann, Asnaani, & Hinton, 2010). Whereas Western conceptualisations of SAD involve the fear individuals hold about embarrassing *oneself*, the fear of embarrassing the *other person* is believed to underlie TKS (e.g., the fear of eye-to-eye contact). Thus, it appears that social anxiety, SAD and TKS are related to culturally determined role expectations and social standards (Hofmann et al., 2010).

Present research. Since culture appears to influence the expression of social anxiety and SAD, it seems plausible that cross-cultural differences also exist in relation to the EMS

[7] It is important to note that several authors argue that the distinction between *individualism* and *collectivism* is somewhat simplistic (see Oyserman, Coon, & Kemmelmeirer, 2002 for a review). For instance, at a societal level it could be argued that Chinese individuals living in Hong Kong display more individualistic values than Chinese individuals from Mainland China due to a greater Western influence (Kemmelmeier & Cheng, 2004). Moreover, at an individual level, there is great variability in how individualistic and collectivistic certain people are within a particular culture.

domains underlying social anxiety and SAD in disparate cultures. Therefore, Chapter 2 of this thesis aims to identify which of Young's schema domains most strongly relate to social anxiety and SAD symptomatology by comparing an Australian sample, a Chinese sample residing in Hong Kong, and a Chinese sample residing in Australia. Given that schema theory predicts that EMS are relatively stable constructs that only tend to alter as a result of psychotherapy or of other significant life experiences (Young et al., 2003), a secondary aim of this paper is to determine whether Hong Kong and Chinese-Australian samples display similar EMS despite the Chinese-Australian sample experiencing a significant life event (i.e. moving to a foreign country).

Culture also provides an important contextual source of information which frequently influences the parenting styles people adopt. Therefore, based upon the results of Chapter 2, Chapter 3 of this thesis will address the relationship between negatively perceived parenting styles, EMS and social anxiety.

Perceived parenting styles

Parenting and EMS. Given that negative parenting practices are considered the primary origin of EMS (e.g., Young, 1990; 1999a; Young et al., 2003), it is not surprising that this area has been the focus of numerous studies related to schema therapy theory. More specifically, the link between negative parenting practices, EMS and psychopathology has been demonstrated in relation to personality disorders (e.g., Thimm, 2010a), eating disorders (e,g., Sheffield, Waller, Emanuelli, Murray, & Meyer, 2005), and depression (e.g., Harris & Curtin, 2002; McGinn, Cukor, & Sanderson, 2005). Nevertheless, few studies have examined this relationship in relation to social anxiety and SAD.

An exception to this is a longitudinal study involving a large sample of adolescents conducted by Calvete (2014) who explored (i) whether or not emotional abuse carried out by parents and peers, both on their own and interactively with temperament (i.e. neuroticism and low extroversion), lead to higher EMS and (ii) whether EMS in turn lead to an increase in depression and social anxiety. The findings revealed that victimisation by peers and

neuroticism were independent predictors of EMS related to the domains of *Disconnection and Rejection, Impaired Autonomy and Performance* and *Other-directedness*. Interestingly, the results of the study suggest that emotional abuse carried out by peers, rather than parents, is associated with the worsening of the aforementioned EMS. However, as Calvete (2014) proposes, one explanation for these findings might be that parenting factors influence the origins of EMS rather than the worsening of EMS during adolescence. It seems plausible that EMS developed during childhood worsen during adolescence due to factors such as peer victimisation (Calvete, 2014). Although these results are in line with Young et al.'s (2003) assertion that peer relationships play an increasingly important role in the aetiology of EMS as an individual matures, they also highlight the need for future research to address the possible role of negative parenting practices in the origin, as opposed to worsening, of EMS in relation to social anxiety and SAD.

Parenting and social anxiety/SAD. Although Hudson and Rapee (2000) identify three factors which are likely to contribute to the family's contribution to social anxiety and SAD including: (i) restricted exposure to social situations, (ii) parental modelling of social concerns, the focus of Chapter 3 will be the third factor, (iii) the child-rearing styles of parents. Specifically, parenting styles such as over-control, overprotection, a lack of warmth as well as rejection have been implicated in the aetiology of social anxiety and SAD in Western cultures (e.g., Klonsky, Dutton, & Liebel, 1990). Whereas parental overprotection is believed to diminish a child's ability to function and become appropriately independent, thereby increasing the chances of promoting anxiety in feared situations, parental rejection is believed to increase the likelihood of the formation of an insecure attachment (Brook & Schmidt, 2008).

Nevertheless, it still remains unclear whether these forms of parenting are associated with higher levels of social anxiety and SAD in Chinese culture given that certain parenting styles, such as overprotection, are observed more frequently in Chinese compared to Western cultures (Chen et al., 1998). It is important to note, however, that the ways in which parents

shape, interpret, and respond to child behaviour is frequently in accordance with culturally prescribed expectations (Chen et al., 1998). For instance, Western (individualistic) cultures tend to promote assertive and autonomous behavioural styles (Singelis, 1994), so these traits are encouraged in children. On the other hand, East Asian cultures (collectivistic) tend to value a more modest behavioural style along with social harmony and deference to parents, so these children are encouraged to restrain personal desires unless it is considered to be in the interest of the collective (Chen et al., 1998).

The mediating role of EMS. Regardless of cultural background, it is important to note that the relationship between one's early experiences and psychopathology is not always linear. That is, while not all insecurely attached children will develop a mental health problem, not all securely attached children will avoid such problems (Sheffield et al., 2005). Young's schema model provides a potential link between negative parenting styles and psychopathology, EMS. Several studies have revealed that EMS may mediate the relationship between negative parenting and various psychopathologies (e.g., Harris & Curtin, 2002; Thimm, 2010b), however this question does not appear to have been addressed in relation to social anxiety and SAD. Moreover, the vast majority of these studies have been carried out in Western countries which hold more individualistic values.

Present research. In extending upon the results described in Chapter 2, the aim of Chapter 3 is to examine whether EMS mediate the relationship between perceived negative parenting (i.e. overprotective or rejecting parenting) and social anxiety. In order to determine whether any cross-cultural differences exist, this relationship will be compared in the three samples outlined in Chapter 2 (an Australian sample, a Chinese sample residing in Hong Kong, and a Chinese sample residing in Australia).

Temperament

Temperament and EMS. While negative parenting styles appear to influence the aetiology of social anxiety, Calvete's (2014) study also highlights the important role that temperament (especially neuroticism) plays in the aetiology of both social anxiety and EMS.

Young et al. (2003) propose that emotional temperament is "especially important" (p.11) in the development of EMS. More specifically, Young et al. (2003) contend that an individual's emotional temperament interacts with environmental factors to influence both the formation and maintenance of EMS due to the frustration of the child's basic needs. To this end, Young et al. (2003) suggest seven separate dimensions of emotional temperament that are considered to be innate and relatively unchangeable through therapy alone (e.g., dysthymic to optimistic, shy to sociable and anxious to calm). Although Young et al. (2003) use the terms "temperament" and "personality" interchangeably, they tend to emphasise the influence of biological predisposition. That is, each child is believed to have a distinct temperament or personality from birth that provides the foundations for how he or she interacts with the world (Young et al., 2003). Therefore, a child's temperament is believed to play an important role in what a child is exposed to, as well as how he or she responds to his or her environment. On the other hand, Young et al. (2003) affirm that an extremely aversive, or alternatively, favourable, early environment can override a child's emotional temperament. For instance, a cold or rejecting family environment may leave a sociable child inhibited, while a loving family may lead an inhibited child to be more sociable (Young et al., 2003).

While several studies have been undertaken to examine the relationship between temperament and EMS associated with various psychopathologies (e.g., Muris, 2006; Sava, 2009; Thimm, 2010a), the authors are only aware of and Calvete's (2014) recent study pertaining to social anxiety and SAD which is described shortly.

When considering the emotional temperament dimensions that Young et al. (2003) relate to EMS development and maintenance, the temperament constructs of inhibition to the unfamiliar (Kagan, Reznick, & Snidman, 1988) and negative affectivity (Rothbart, Ahadi, & Evans, 2000) in children appear to be the antecedents most closely related to the personality variables of introversion and neuroticism in adults. For the purposes of this thesis, *introversion* (which is inversely related to extroversion) is defined as a tendency and preference for fewer social interactions while *neuroticism* is defined as the general tendency

of an individual to experience unpleasant emotions (McCrae et al., 2000). The personality traits of introversion and neuroticism have been implicated in the majority of prominent trait models, including the Big Five and Big Three (Clark & Watson, 1999). Moreover, research indicates that these factors have a substantial genetic component (Clark & Watson, 1999), are highly robust and remain fairly stable over time (Molfese & Molfese, 2000) and that they are strongly associated with social anxiety and SAD (e.g., Kashdan, 2002; Levinson, Langer, & Rodebaugh, 2011; Naragon-Gainey & Watson, 2011).

In addition to emotional abuse perpetrated by parents and peers, Calvete (2014) explored the roles that these two temperament traits (i.e. neuroticism and low extroversion) play in the worsening of EMS in an adolescent sample. Overall, the results of this study revealed that emotional abuse perpetrated by peers and neuroticism (rather than low extroversion) were associated with to the worsening of schemas related to *Disconnection and Rejection, Impaired Autonomy and Performance,* and *Other-directedness*. The association between neuroticism and various EMS has also been highlighted in previous studies concerning other psychopathologies (e.g., Muris, 2006; Sava, 2009; Thimm, 2010a). These findings make sense theoretically given that neuroticism is related to the general tendency to experience unpleasant emotions, including anxiety, anger and depression. While Calvete (2014) did not find a significant relationship between low extroversion and EMS it is worth noting that this study was comprised of an adolescent sample. Therefore, a gap in the relevant literature remains regarding the relationship between these temperament traits, EMS and social anxiety in adults.

Temperament and coping. While Young et al. (2003) assert that temperament is "especially important" (p. 11) in the development and maintenance of EMS, they also suggest that temperament is "one of the main factors" (p. 35) that determines the coping strategies individuals adopt. In fact, it has been proposed that "temperament probably plays a greater role in determining a patients' coping styles than it does in determining their schemas" (Young et al., 2003, p. 35). Thus, schema therapy theory differentiates between EMS and the

strategies an individual might employ to cope with EMS which are frequently associated with intense and painful thoughts, memories and emotions. Unlike an individual's untreated EMS, however, an individual's coping style does not tend to remain stable over time. Consequently, a person may use different strategies to cope with the same EMS in different situations or at different periods of their life.

Young (1990; 1999a) and colleagues (Young et al., 2003) propose three coping styles typically used to cope with EMS, including schema *surrender, avoidance* and *overcompensation*. These styles are analogous to the three basic responses to threat within the anxiety literature, *freeze*, *flight* and *fight*, respectively. While *schema surrender* refers to the acceptance of a schema, *schema avoidance* refers to when an individual attempts not to activate schemas and *schema overcompensation* is when an individual attempts to fight against the schema (Young et al., 2003).

Although several studies have been conducted investigating the link between Young's coping styles and certain psychopathologies, particularly in individuals with substance abuse problems (e.g., Brotchie, Hanes, Wendon, & Waller, 2006) and eating disorders (e.g., Sheffield, Waller, Emanuelli, Murray, & Meyer, 2009; Spranger, Waller, & Bryant-Waugh, 2001), scarce research has been conducted in relation to social anxiety and SAD. An exception to this is Hinrichsen, Wright, Waller, and Meyer's (2003) study where the results revealed that social anxiety is linked to higher levels of dissociation (i.e. a form of cognitive avoidance) in a restrictive anorexia sample. While the results of this study can be used to inform theory and treatment regarding eating disorders, further research is needed into the strategies utilised by individuals with social anxiety and SAD to cope with EMS given that this sample was comprised of females with eating disorders (and a control group) and focused upon a specific form of cognitive avoidance (i.e. dissociation).

Avoidance and social anxiety/SAD. Avoidance has played a prominent role in the major models of social anxiety (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997). Research and clinical evidence suggest that individuals with social anxiety and SAD are more

likely to avoid social situations and rely more heavily on safety behaviours, such as over preparing for events or drinking excessive amounts of alcohol, to cope in anxiety provoking situations (Morrison & Heimberg, 2013).

According to Young (1999a), three forms of avoidance exist, including *behavioural* (using escape behaviours, such as leaving a social situation due to fear) and/or *somatic* (experiencing physical symptoms), *cognitive* (avoid thinking about certain upsetting subjects) and *emotional* (blocking or numbing feelings). Young (1999a) and colleagues (Young et al., 2003) suggest that, while these forms of avoidance might be useful in the short term or during childhood because they may reduce the likelihood of the EMS being activated, these strategies may, in fact, serve to maintain the schema because the underlying belief has not been disconfirmed.

Overcompensation and social anxiety/SAD. In addition to avoidance strategies, clinical observations also suggest that some individuals with social anxiety and SAD use overcompensation strategies. For example, because of a fear of negative evaluation (Furmark, 2002), individuals with social anxiety and SAD may have excessively high standards for themselves (e.g., Clark & Wells, 1995) or utilise perfectionistic self-presentation to compensate for their perceived inadequacies (e.g., Jain & Sudhir, 2010).

According to Young et al. (2003), schema overcompensation is often an attempt by the individual to challenge an underlying EMS, however, the response is frequently excessive which can result in perpetuating the schema. For instance, if children were controlled by significant others while they were young, they may grow up attempting to control others or oppose all forms of influence by others (Young et al., 2003).

Young's coping style inventories. In order to identify and assess the use of avoidance and overcompensation strategies, Young and Rygh (1994) developed the *Young-Rygh Avoidance Inventory* (YRAI) and Young (1998b) developed the *Young Compensation Inventory* (YCI). The YRAI was designed to measure each of the three forms of avoidance initially proposed by Young (1999a), including behavioural and/or somatic, cognitive and

emotional avoidance strategies. Although Young's original theory proposed that overcompensation is a single construct, recent research involving individuals with eating disorders and non-clinical samples suggests that there could be three sub-scales. For instance, in research testing a new schema-based cognitive-behavioural model in relation to eating disorders, Luck, Waller, Meyer, Ussher, and Lacey's (2005) found that three factors arose in both the eating disordered and nonclinical samples. These subscales included *personal control* (avoidance of emotional activation through controlling oneself), *social control* (avoiding emotional activation through the control of others) and *individuality* (avoidance of emotional activation through independence and rebellion against mainstream society) (Luck et al., 2005). While the results of Luck et al.'s (2005) study has significantly contributed to the understanding of coping strategies in individuals with eating disorders, limited studies have been undertaken outside substance abuse problems (e.g., Brotchie et al., 2006) and eating disorders (e.g., Luck et al., 2005; Sheffield et al., 2009; Spranger et al., 2001).

Present research. In considering the limited research to date on the relationship between temperament (e.g., introversion and neuroticism), Young's proposed coping styles (e.g., avoidance and overcompensation), EMS and social anxiety or SAD, Chapter 4 of this thesis aims to examine the theoretical pathways proposed by Young's schema therapy model in relation to these variables. In particular, it remains unknown whether temperament does, in fact, play a greater role in determining individuals' coping styles than it does in determining their EMS. Additionally, the psychometric properties of the YRAI and YCI will be explored given the limited number of studies addressing this issue.

As noted by Welburn et al. (2002), one of the difficulties in assessing EMS is that they are believed to be, to a degree, unconscious structures while self-report inventories, including the *Young Schema Questionnaire*, *Young-Rygh Avoidance Inventory* and *Young Compensation Inventory*, rely upon the respondent's conscious awareness of the problem and use of coping strategies. Therefore, it could be argued that EMS are best assessed using methods that do not solely rely upon conscious awareness, such as physiological indicators of

emotional states (Welburn et al., 2002). As a result, it has been suggested that the subliminal presentation of threatening stimuli might provide insight into how information is processed whilst bypassing coping strategies associated with psychopathologies, such as avoidance. Thus, the aim of Chapter 5 addresses this need.

The processing of threatening information

Young et al. (2003) propose a biological view of EMS, where it has been suggested that threatening stimuli are frequently processed by the amygdala outside of awareness before the associated emotions, bodily sensations and cognitions are processed consciously. Nevertheless, this aspect of schema therapy theory has received very little attention in the literature. While scarce research exists in relation to cognitive processes, EMS and social anxiety, Calvete et al. (2013) examined whether EMS predict anxious automatic thoughts, and whether such thoughts act as mediators between schemas and changes in social anxiety symptoms (as well as a reversed model in which schemas acted as mediators between automatic thoughts and social anxiety) in a large non-clinical sample of adolescents. The findings of this longitudinal study supported a hierarchical model of social anxiety with schemas predicting automatic thoughts. The results also supported a model in which automatic thoughts contribute to perpetuating schemas. Hence, in line with Young et al.'s (2003) theory, it appears that EMS guide cognitive processing so that the individual focuses on information that confirms their schemas whilst denying or minimising information that contradicts those beliefs. Having misperceived certain situations, the accompanying negative automatic thoughts in turn reinforce the EMS, which serves to perpetuate the cycle (Calvete et al., 2013). While Calvete et al.'s (2013) study has important theoretical and clinical implications in relation to social anxiety and SAD, questions still remain about the cognitive processes associated with EMS.

According to Young et al. (2003), EMS represent the presence of threat (i.e. the frustration of one or more of the individual's core emotional needs and/or the associated emotions or bodily reactions). Although Young et al. (2003) do not specify a specific model

by which threatening information is processed, Beck and Clark (1997) offer a revised schema-based information processing model of anxiety which takes into account the unconscious processing of threatening information. In the current research, Beck and Clark's (1997) cognitive model will be drawn upon in order to assess whether the presentation of threatening information is processed differently between groups of individuals low and high on social interaction anxiety.

Subliminal research. Although the vast majority of experimental studies examining EMS rely upon conscious processing tasks, whereby the threat is consciously perceived, subliminal processing tasks suggest that emotionally threatening information can take effect outside of awareness, or pre-consciously. Silverman (1983) suggests that subliminal stimuli are, in part, effective because threatening information bypasses defence strategies (e.g., avoidance) and can influence latter behaviour or physiological responses. Although several visual subliminal studies have been carried out in relation to social anxiety and SAD, the majority have examined the effect of images of threatening faces on physiological responses (e.g., via functional magnetic resonance imaging and/or skin conductance). While the results of these studies suggest that the individuals with greater social anxiety symptomatology who receive subliminal images of threatening faces (e.g., angry) typically display greater differences in physiological and self-report measures compared to individuals who receive subliminal neutral of happy faces (e.g., Cooney, Atlas, Joormann, Eugène, & Gotlib, 2006; Dannlowski et al., 2013; Killgore & Yurgelun-Todd, 2005), no study to the author's knowledge has examined the effect of schema-related stimuli in relation to social anxiety symptomatology.

Nevertheless, numerous studies utilising subliminal methodologies have been conducted concerning eating behaviours. For example, a study conducted by Patton (1992) revealed that, compared to a group of females subliminally presented a visual neutral cue (i.e. "mama is loaning it"), a group of females presented with an abonnement related cue (i.e. "mama is leaving me") ate significantly more crackers during a five minute taste testing task. In

addition to subliminal abandonment cues increasing eating behaviour, a study conducted by Waller and Barter (2005) involving 96 non-clinical women revealed that women who received a subliminal unification cue ("friendship") either before or after a subliminal abandonment cue ("lonely") subsequently ate significantly less crackers, suggesting that counter-schematic subliminal cues may have an ameliorative effect on maladaptive schemas and related behavioural responses (i.e. eating).

Such studies are significant for several reasons. First, they provide evidence that threat related stimuli are, to some extent, processed unconsciously and can negatively impact upon latter behaviours (e.g., eating). Second, negative stimuli may serve in identifying maladaptive schemas to target during treatment. Third, counter-schematic stimuli may have an ameliorative effect on maladaptive schemas and associated behavioural responses.

Present research. In extending upon Chapter 4, the aim of Chapter 5 is to further the understanding of links between EMS and social anxiety by ascertaining whether threatening information is processed outside awareness before it is potentially consciously perceived by drawing upon Beck and Clark's (1997) revised schema-based information processing model of anxiety. Moreover, this study will investigate whether visual subliminal presentations of stimuli related to *Disconnection and Rejection* schemas will increase subsequent levels of social anxiety compared to counter-schematic stimuli which was proposed to have an ameliorative effect. Given the prominent role of avoidance in the aetiology of social anxiety in past (Morrison & Heimberg, 2013) and present (Chapter 4) research, the influence of avoidance in the processing of threatening information will also be explored.

The Present Research

The above literature review highlights that substantial gaps in the literature remain regarding schema therapy theory in general, but particularly in relation to social anxiety and SAD. Therefore, the primary aim of this thesis is to examine several of the pathways proposed by Young's et al.'s (2003) schema therapy model in relation to social anxiety. Studies 1 and 2, presented in Chapters 2 and 3 respectively, are based on data collected from

163 Australian students, 118 Chinese students residing in Hong Kong and 120 Chinese students residing in Australia (Chinese- Australian). Study 1 aims at examining (i) whether cross-cultural differences exist in EMS domains, (ii) which EMS domains are associated most strongly with social anxiety in each of these samples, and (iii) whether EMS domains remain stable in the Chinese samples, despite the Chinese-Australian sample moving to a foreign country. Following from this, Study 2 will investigate whether EMS mediate the relationship between perceived negative parenting practices (i.e. cold or rejecting and overprotective parenting) and social anxiety in the Australian, Hong Kong and Chinese-Australian samples. Cross-cultural differences in the EMS mediating this relationship will be highlighted in order to underscore the relevance of schema therapy theory and treatment in each culture.

Previous research has highlighted the importance of temperament and coping styles in the aetiology of EMS and social anxiety/SAD separately, however limited studies have brought these fields together. As a result, the aim of Study 3 will be to explore the relationship between temperament (i.e. neuroticism and introversion), coping styles (i.e. avoidance and overcompensation), EMS (in this case the *Disconnection and Rejection* domain based on past (e.g., Calvete & Orue, 2008; Pinto-Gouveia et al., 2006) and present (Studies 1 and 2) research in adult samples), and social anxiety. Path analysis will be used to evaluate data collected from 360 Australian university students. In particular, Young's belief that temperament may play a greater role in determining individual's coping styles than it does in shaping their EMS will be explored.

Finally, Study 4 will explore whether or not threatening information related to EMS is processed outside awareness by drawing upon Beck and Clark's (1997) revised schema-based information processing model of anxiety. In an experimental design, 89 Australian university students (n = 14, 14 and 15 per group) will be presented with either a visual subliminal schema-consistent *Disconnection and Rejection* ("mummy does not love me"), counter-schematic ("mummy does love me") or neutral ("mummy is walking") cue in order to examine whether individuals low and high in social interaction anxiety will process

information differently. Moreover, the role that avoidance plays in relation to these variables will also be considered.

Collectively, the four studies are designed to shed light on different aspects of Young's schema therapy theory that have received considerably less attention in previous research. Additional objectives of the present thesis include (i) extending extant research by examining whether cross-cultural differences exist in the schematic makeup of individuals with social anxiety and SAD (Studies 1 and 2), (ii) discussing the importance of considering individuals' cultural background and EMS when assessing and treating social anxiety and SAD (Studies 1 and 2), (iii) examining whether it is more valuable to address socially anxious individuals' EMS or coping styles in clinical settings (Study 3), and (iv) investigating whether subliminal presentations can be used as an adjunct to cognitive therapies when treating individuals with social anxiety and SAD (Study 4). Therefore, the implications of the findings for each of the studies in relation to schema therapy theory and treatment concerning social anxiety and SAD will be discussed, in addition to directions for future research.

Chapter 2

Early Maladaptive Schemas and Social Anxiety: A Cross-Cultural Comparison

Author contribution:

Miss Kathleen Mairet was solely responsible for the design of the research, data analysis and write-up of this paper. Dr Simon Boag, Dr Wayne Warburton and Professor Ron Rapee provided research supervision and feedback on the paper. Dr Chee Wing Wong assisted in recruitment of students from the Chinese University of Hong Kong and provided feedback on the paper.

Abstract

The present study was the first to compare a Chinese sample residing in Hong Kong (*n* = 118), a Chinese sample residing in Australia (*n* = 120) and an Australian sample (*n* = 163) to determine: (i) whether cross-cultural differences in early maladaptive schema (EMS) domains exist; (ii) which EMS domains postulated by Young's schema model are associated most strongly with social anxiety; and (iii) whether Hong Kong and Chinese-Australian samples display similar EMS domains, despite the Chinese-Australian sample experiencing a significant life event (i.e. moving to a foreign country). Results suggest that cultural differences do exist between Chinese and Australian samples independent of social anxiety, although similarities emerged (particularly between the Chinese-Australian and Australian samples concerning schemas related to *Impaired Autonomy and Performance*) when social anxiety was taken into account. Preliminary evidence also suggests that EMS domains remain similar despite Chinese-Australian students residing in a foreign country, however some differences emerged between the Chinese samples when social anxiety was taken into account. Consistent with previous research, the results revealed that Chinese and Australian individuals experiencing higher levels of social anxiety have higher levels of EMS related to *Disconnection and Rejection*. However, the findings also highlight the importance of EMS related to *Impaired Autonomy and Performance* in each of these samples.[8]

[8] Manuscript submitted for publication. In subsequent chapters this study is referred to as "Mairet, K., Boag, S., Wong, C. W., Warburton, W., & Rapee, R. M. (2014a). *Early maladaptive schemas and social anxiety: A cross-cultural comparison*".

Introduction

Social anxiety is a fear of social situations in which the individual anticipates the possibility of being negatively evaluated by others. Accordingly, public speaking, expressing opinions and socialising are often avoided or endured with discomfort (American Psychiatric Association [APA], 2013). When this fear becomes severe or disabling, it can meet diagnostic criteria for social anxiety disorder (SAD), also referred to as social phobia (APA, 2013). Traditional cognitive behavioural therapy (CBT) is currently considered the most successful treatment for individuals with social anxiety and SAD (see Rodebaugh, Holaway, & Heimberg, 2004). Young and colleagues (Young, Klosko, & Weishaar, 2003), however, have modified and extended traditional CBT to develop an integrative form of therapy which is believed to be appropriate for the treatment of individuals with long-standing and self-defeating core themes or patterns, also known as early maladaptive schemas (EMS). In addition to parenting practices, temperament, and peers, Young et al. (2003) suggest that culture may contribute to the development of EMS. However, despite the widespread use of schema therapy to treat various disorders, including chronic anxiety, limited studies have compared cross-cultural differences in: (i) maladaptive schemas; (ii) the maladaptive schemas that are associated with social anxiety in disparate cultures, and; (iii) the impact of a significant life event, such as moving to a country with different cultural values, on EMS.

Social Anxiety and Culture

For the purposes of this paper, culture will be defined as "...a socially transmitted or socially constructed constellation consisting of such things as practices, competencies, ideas, schemas, symbols, values, norms, institutions, goals, constitutive rules, artefacts, and modifications of the physical environment" (Fiske, 2002, p. 85). Key features of culture relevant to the diagnostic classification and assessment of psychiatric symptomatology, such as cultural identity and cultural conceptualisations of distress, have played a more prominent role in the *Diagnostic and Statistical Manual of Mental Disorders, 5th Edition* (DSM-V: APA, 2013). However, cross-cultural research into social anxiety and SAD, which is necessary for

guiding both theory and treatment, is in its early stages with the vast majority of studies come from Western nations, such as the United States and Europe, making generalisation to other cultures difficult. Although research indicates that social anxiety is observed in cultures strikingly different to Western cultures (Schreier et al., 2010), it is likely that cultural variation in both the expression of social anxiety and the situations in which it is elicited exist. This is because cultural context is likely to shape one's sense of their social self as well as perceptions of both acceptable social behaviour and the threat value of unacceptable behaviour (Hong & Woody, 2007). For instance, *Taijin kyofusho* (TKS) is an expression of SAD which is believed to be prevalent in Japanese and Korean cultures (Hofmann, Asnaani, & Hinton, 2010). Unlike Western conceptualisations of social anxiety and SAD, in which individuals have a fear of embarrassing *oneself*, individuals experiencing TKS are concerned about behaving in such a way as to offend or embarrass the *other person* (e.g., the fear of eye-to-eye contact). Either way, TKS, social anxiety and SAD seem to be related to culturally determined role expectations and social standards (Hofmann et al., 2010).

One cultural dimension that may be relevant to shaping social anxiety and SAD involves individualism and collectivism. Although some authors argue that it is important not to oversimplify the individualism-collectivism distinction at an individual level (e.g., Oyserman, Coon, & Kemmelmeier, 2002), collectivist societies, such as those of East Asia, are thought to promote an interdependent self-construal that values a self-effacing behavioural style, which emphasises social harmony, reticence and deference to parents as well as a shared sense of identity and responsibility (Okazaki, 1997). Alternatively, individualistic societies, such as the United States and Australia, are thought to promote an independent self-construal that values a more autonomous and assertive behavioural style that emphasises personal uniqueness, goals and control (Singelis, 1994). It is therefore likely that a comparison of samples from individualistic and collectivistic cultures will differ in terms of social anxiety and related schemas.

Culture and Early Maladaptive Schemas

Given that culture appears to influence the manifestation of social anxiety and SAD, it seems germane to examine whether cultural differences are associated with variations in non-conscious processing of schematic information. In extending Beck's (1967) original conceptualisation of schemas (i.e. any broad organising principle used to make sense of one's self, the world and others), Young (1999a) hypothesised that maladaptive schemas frequently develop as a result of 'toxic' childhood experiences due to unmet childhood needs, such as secure attachments to significant others and a sense of autonomy. Young et al. (2003) define EMS as broad, pervasive dysfunctional character traits regarding oneself and one's relationship with others that develop during childhood and are elaborated upon throughout one's life. While EMS allow children to initially manage and comprehend their environment, they often outlive their utility in adulthood, creating anxiety and depression when either real or perceived situations activate the relevant schema (Young et al., 2003). Based on clinical experience, Young (1990; 1999a) proposed 18 EMS (see Appendix A) that fall into five broad categories or "schema domains" (*Disconnection and Rejection*, *Impaired Autonomy and Performance*, *Impaired Limits*, *Other-directedness* and *Overvigilance and Inhibition*).

Both theory and research suggests that there is an association between EMS and psychiatric symptomatology. For instance, Welburn, Coristine, Dagg, Pontefract and Jordan (2002) found that while *vulnerability to harm, abandonment, failure, self-sacrifice* and *emotional inhibition* EMS were related to anxiety, *abandonment* and *insufficient self-control* were most relevant to depression. As a result, the assessment of EMS associated with various psychological symptoms is important both theoretically and clinically given that once schemas have been identified, interventions can be utilised to correct cognitive distortions and related symptomatology (Welburn et al., 2002). Given that EMS are believed to be a maintaining factor for persistent psychiatric symptomatology, a fundamental assumption of schema theory is that they are stable constructs that only tend to alter as a result of psychotherapy or through other significant life experiences (Young et al., 2003). Although

several studies indicate that EMS remain fairly stable in both child (Stallard, 2007) and adult samples (Riso et al., 2006; Wang, Halvorsen, Eisemann, & Waterloo, 2010), additional studies in this field are required. For instance, little is known about the types of life experiences which may alter the stability of EMS.

Compared to other psychological disorders, such as eating disorders (e.g., Luck, Waller, Meyer, Ussher, & Lacey, 2005; Sheffield, Waller, Emanuelli, Murray, & Meyer, 2009; Spranger, Waller, & Bryant-Waugh, 2001), depression (e.g., Darvishi, Rahmani, Akbari, & Rahbar, 2013; Halvorsen et al., 2009; Harris & Curtin, 2002) and personality disorders (e.g., Astaneh, Bahrami, & Farahani, 2013; Geiger, Peters, Sauer-Zavala, & Baer, 2013; Nordahl, Holthe, & Haugum, 2005), few studies have assessed the schematic content and processes associated with social anxiety and SAD. Hinrichsen, Waller and Emanuelli (2004), examined the EMS associated with social anxiety and agoraphobia in individuals with eating disorders. Multiple regression analyses revealed that females with eating disorders with high levels of comorbid social anxiety had higher *abandonment* and *emotional inhibition* EMS, which accounted for 25.9% of the variance. This suggests that individuals with social anxiety seem to fear that significant others may leave them and that they need to hide their true feelings to avoid disapproval by others. Nevertheless, further studies on the schematic structure of individuals with social anxiety were necessary given that this study was limited to a sample of females with eating disorders.

One such study conducted by Pinto-Gouveia, Castilho, Galhardo and Cunha (2006) compared the schematic structure of individuals with SAD, other anxiety disorders (including panic disorder and obsessive-compulsive disorder) and non-psychiatric controls. Results suggested that individuals with SAD had higher levels of all assessed EMS compared to controls except *unrelenting standards/hypercriticalness* and were higher than the mixed anxiety group on *emotional deprivation, mistrust/abuse, social isolation/alienation, defectiveness/shame, failure, social undesirability/defectiveness, subjugation* and *dependence*. These findings suggest that individuals with SAD experience EMS which primarily relate to

the area of *Disconnection and Rejection*. Moreover, results indicated that *emotional deprivation, mistrust/abuse, defectiveness/shame* and *unrelenting standards/hypercriticalness* schemas made a unique contribution to the prediction of the fear of negative evaluation. Finally, Calvete and Orue (2008) conducted a study using a non-clinical sample of university students to investigate the association between EMS and social anxiety. Results of this study indicated that social anxiety is primarily associated with *abandonment, failure* and *emotional inhibition* schemas. This suggests that individuals exhibiting higher social anxiety have a fear that significant others may leave them, that they will inevitably fail or that they are inadequate and need to hide their true feelings to avoid disapproval by others. Overall, previous findings suggest that adults with social anxiety experience EMS which primarily relate to *Disconnection and Rejection*; although there are some exceptions.

The Young Schema Questionnaire and cross-cultural research

Although extensive research has been undertaken to establish the reliability and validity of the *Young Schema Questionnaire* (*YSQ*) in Western countries, considerably less research has occurred in disparate cultures. Nonetheless, Cui, Lin and Oei (2011) investigated the cross-cultural differences in the factor structure and psychometric properties of the *YSQ-Short Form* in 712 Chinese undergraduate students. Cui et al.'s (2011) findings suggest that the structure of the *YSQ-Short Form* may be generalisable to non-Western cultural groups. Results did, however, suggest that certain EMS, such as *subjugation,* may not be as reliable in Chinese samples and that a model with 14 as opposed to 16 factors (as the *YSQ-S2* has 16 subscales while the revised *YSQ-S3* has 18) with three higher-order factors provided a better fit of the data in Chinese undergraduates. For the most part, results from the higher-order factor analysis substantiate Young's (1999a) organisation of EMS into schema domains which are influenced by specific types of childhood experiences (Cui et al., 2011). The first higher-order factor corresponded to Young's schema domain of *Impaired Autonomy and Performance* which comprised the same aforementioned schema subscales. The second higher-order factor loaded onto Young's *Disconnection and Rejection* schema domain and is

comprised of the same schema subscales, except for *abandonment*. Finally, a third higher-order factor emerged comprised of *self-sacrifice*, *unrelenting standards*, and *entitlement/grandiosity* EMS from the *Other-directedness*, *Overvigilance and Inhibition* and *Impaired Limits* domains, respectively.

Similar to findings in Western cultures, Cui et al.'s (2011) study also provides further evidence for the predictive validity of the *YSQ-Short Form* in Chinese undergraduate students. For instance, while subscales relating to *emotional deprivation*, *dependence/incompetence* and *self-sacrifice*, which are associated with loss and worthlessness predicted depression, *mistrust*/*abuse* and *vulnerability to harm or illness* EMS predicted anxiety. Overall, Cui et al.'s (2011) study provides preliminary evidence that *YSQ-Short Form* domains may be generalisable to Chinese samples.

Current Study

Although Young et al. (2003) have identified culture as a factor which may influence the development of EMS, limited research has been carried out on cross-cultural differences in EMS or EMS that are associated with social anxiety and SAD. Moreover, there is a paucity of research examining whether significant life events alter EMS. As such, EMS will be compared in Chinese students residing in Hong Kong (Hong Kong sample) and Chinese students who have recently migrated to Australia (Chinese-Australian sample). Based on schema theory and research, three predictions were proposed. First, there will be differences in EMS domains when comparing the Chinese (both Hong Kong and Chinese-Australian) and Australian samples. [9]Second, although differences will exist in secondary domains, Australian and Chinese individuals higher on social anxiety will primarily display higher EMS associated with the domain of *Disconnection and Rejection*. Finally, Hong Kong and Chinese-Australian samples will display similar EMS both at a broad level and in relation to social

[9] Given the paucity of research addressing cross-cultural differences in early maladaptive schemas, as well as Young et al.'s (2003) general assumption that cross-cultural differences exist, no specific hypotheses regarding individual schema domains have been made.

anxiety, despite the Chinese-Australian sample experiencing a significant life event (i.e. moving to a foreign country with different values).

Method

Participants

Similarly to Hsu and Alden (2008), a student sample was utilised for several reasons: (i) research suggesting that comparatively fewer Chinese individuals seek psychological treatment compared to Western individuals (see Leong & Lau, 2001) making the recruitment of clinical samples difficult and; (ii) recent research indicating that social anxiety and SAD exist along a continuum (e.g., Brook & Schmidt, 2008; Fehm, Beesdo, Jacobi, & Fielder, 2008).

Three samples of students were drawn from two urban based universities in Australia and Hong Kong. This facilitated the collection of data roughly matched across certain demographic variables, such as age and education level. In order to maximise cultural distinctiveness, the criteria outlined by Hong and Woody (2007) comparing Korean and Euro-Canadian samples on measures of social anxiety and self-views were applied. As such, each participant had to identify themselves as being either of Australian (or Chinese) descent or at least third generation Australian (or Chinese), had not spent more than 7 years in a non-Western country (or Western country, including Australia) and spoke and read English (or Chinese) as their first language. The three samples were as follows:

Australian sample. The first sample consisted of 163 Australian university students (72 male, 91 female) with a mean age of 21 years (*SD* = 5.14) who participated in return for course credit. One hundred and forty five participants were born in Australia (89%) while 18 were born elsewhere but identified themselves as Australian (11%). Table 1 presents the length of time students had been residing in the relevant country.

Chinese sample residing in Australia. The second sample consisted of 120 Chinese students residing in Australia (32 male, 88 female) with a mean age of 22 years (*SD* = 2.55) who were included in a draw for a shopping voucher. Of these participants, 107 were born in

Mainland China (89%), 6 in Hong Kong (5%), 4 in Taiwan (3%), 1 in Singapore (1%) and 2 in another country but identified themselves as Chinese (2%).

Chinese sample residing in Hong Kong. Finally, 118 Chinese participants were recruited (58 male, 60 female) with a mean age of 21 years (*SD* = 3.22) in return for course credit. Twenty-six participants were born in Mainland China (22%), 88 in Hong Kong (74%), 1 in Taiwan (1%), 1 in Singapore (1%) and 2 in another country but identified themselves as Chinese (2%).

These three samples will be subsequently referred to as Australian participants, Chinese participants residing in Australia (or Chinese-Australian) and Chinese participants residing in Hong Kong (or Hong Kong). To test for potential age and gender differences, a multinomial logistic regression was conducted with cultural groups as the dependent variable. There were no significant differences in age across groups, [χ^2 (4, N = 401) = 3.73, p = .155], however there was a significant difference in gender, [χ^2 (4, N = 401) = 14.71, p = .001]. Therefore, gender was statistically controlled in the analyses reported below.

Table 1
Additional Demographic Information.

Length of residency					
	≤ 3mth	4 mths-1yr	1.1 yrs-3 yrs	3.1 yrs -10yrs	10 yrs+
Australian sample	0%	0%	0%	.6%	99.4%
Chinese-Australian sample	58.2%	20.7%	16.9%	4.2%	0%
Hong Kong sample	2.5%	2.4%	5.7%	4.8%	84.6%

Translation Process

It has been argued that culture can influence thought either directly, through socialisation, or indirectly as the individuals learns the language of that culture (Bandura, 1986). In accordance with this tenet, past research indicates that the language in which an inventory is presented can act as a cognitive cue which influences bilingual individuals'

responses (Oyserman, & Lee, 2008; Ralston, Cunniff, & Gustafson, 1995) even when the questions are closed-ended and do not require any language production on the part of the participant (Kemmelmeier & Cheng, 2004). For instance, when bilingual Chinese participants respond to an inventory written in English, it is possible that their thoughts and subsequent responses may be influenced by both the English language and Western individualistic values and vice versa with Chinese and Eastern collectivistic values (see Ralston et al., 1995). In a recent study, however, Kemmelmeier and Cheng (2004) found that language priming had a greater effect on independent self-construal in bilingual Chinese participants residing in Hong Kong than interdependent self-construal. Therefore, to avoid this priming effect, the Chinese students residing in both Australia and Hong Kong received each of the inventories written in Chinese. Documents which had not already been translated into Chinese were done so by an accredited translator. Each document was subsequently back translated into English by a second bilingual individual and an independent bilingual translator reviewed any discrepancies in order to ensure conceptual equivalence.

Measures

Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS). The SIAS and SPS (Mattick & Clarke, 1998) are two companion self-report measures used to assess social anxiety fears. While the SIAS examines fears of general social interaction, such as mixing in a group and making friends (e.g., "I am tense mixing in a group"), the SPS examines fears of being scrutinised when doing routine activities, such as writing and eating (e.g., "I become anxious if I have to write in front of other people"). Each inventory contains 20 items rated on a 5 point Likert scale ranging from 0. *not at all characteristic or true of me* to 4. *extremely characteristic or true of me*. Three items of the SIAS were reverse scored before being summed. The SIAS and SPS have been found to have excellent coefficient alphas of .90 within a non-clinical sample (Mattick & Clarke, 1998). In the present study, the SIAS and SPS displayed good to excellent reliability, with coefficient alphas of .93 and .94, respectively in the Australian sample, .88 and .91 in the Chinese-Australian sample and .91

and .95 in the Hong Kong sample. Despite their high inter-correlation (.72), the SIAS and SPS were assessed separately given that the scales examine different aspects of social anxiety (Mattick & Clarke, 1998). The independent assessment of the SIAS and SPS was particularly important in the current study given evidence suggesting that there are cultural differences in the manifestation of social anxiety.

Young Schema Questionnaire – Short Form (YSQ - S3). The YSQ-S3 (Young, 2005)[10] is a 90 item self-report inventory that measures the 18 EMS described in Appendix A. The beliefs underlying schemas are assessed using five items, with each response ranging from 1. *completely untrue of me* to 6. *describes me perfectly*, with higher scores reflecting a participant's greater endorsement of beliefs linked to a particular EMS (e.g., "I feel that I'm not lovable"). The YSQ-S2 contains 75 of the 90 items contained in the YSQ-S3. The subscales *admiration/recognition seeking*, *pessimism/worry* and *self-punitiveness* have subsequently been added, however there are few changes to the content and wording of the original YSQ-S2 whose psychometric properties have been assessed more vigorously. While the YSQ-S2 (Young, 1994) appears robust in Western samples, comparatively less research has been undertaken in disparate cultures. However, the YSQ-S2 has displayed moderate to high internal validity and reliability, with coefficient alphas ranging between .81 and .94 in an Australian sample (Baranoff, Oei, Cho, & Kwon, 2006) and between .71 and .86 in a Chinese sample (Cui et al., 2011). It is important to remember, however, that these results were based upon adapted versions of the YSQ-S2 which comprised of 13 and 14 factors, respectively, as opposed to 15. The decision to retain each of the 18 subscales from the YSQ-S3 was made as all 18 schemas are of interest in the current study. In the current study, the YSQ-S3 displayed good to excellent reliability coefficients ranging between .77 (*Domain 3*) and .95 (*Domain 1*) in the Australian sample, .77 (*Domain 3*) and .91 (*Domain 1*) in the Chinese-Australian sample and .74 (*Domain 4*) and .93 (*Domain 1*) in the Hong Kong sample.

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Procedure

Data presented were collected as part of a larger cross-cultural study. The institutions' ethics committees approved the study protocol (see Appendix c). In order to increase anonymity and confidentiality, particularly regarding topics which may not be as openly discussed publicly in Chinese culture due to stigmatisation (i.e. symptomatology and EMS), students from the three samples completed the survey online.

Participants were first asked to complete a demographics questionnaire enquiring about their age, gender, birthplace, parents' birthplace, how many months and years they have been residing in Australia or Hong Kong. Participants then completed the SIAS, SPS and YSQ-S3. Finally, participants received an Information Form and were thanked for participating.

Results

Statistical Analysis

The results are presented in four sections. First, results from preliminary data analyses are reported. Second, a multivariate analysis of variance (MANOVA), using the general linear model (GLM) procedure, is presented examining whether cross-cultural differences in schema domains exist. A multivariate analysis was conducted due to the high correlation between SIAS and SPS. Third, partial correlations between each of the five maladaptive schema domains of the YSQ-S3 and social anxiety (SIAS and SPS) are reported for each sample. Finally, a separate MANOVA is presented for each cultural group assessing which maladaptive schema domains were associated most strongly to social anxiety in each of the three samples. Gender was controlled in each of these analyses.

Preliminary Data Analysis

Statistical analyses were carried out using *Statistical Packages for the Social Sciences* (SPSS v 19). A small amount of data was missing at the item level for eight of the 120 Chinese-Australian students and this missing data was imputed using the expectation-maximisation (EM) algorithm in SPSS. The EM procedure has been found to be superior to list-wise deletion, means substitution or pair-wise deletion (Allison, 2002; Enders, 2001;

Schafer & Graham, 2002). Descriptive statistics for the variables of interest are presented in Table 2. All means were within the expected range for a nonclinical sample. Skewness statistics within each of the samples for the SPS, as well as domains 1 and 2 of the YSQ-S3 exceeded the recommended cut off of two times the standard error (Tabachnick & Fidell, 2001). As a result, these variables were transformed using a Log10 transformation prior to subsequent analyses. As previously noted, gender will be controlled in each of the subsequent analyses.

Table 2
Descriptive statistics for variables of interest.

	SIAS	*SPS* [a]	*Domain 1* [a]	*Domain 2* [a]	*Domain 3*	*Domain 4*	*Domain5*
Australian $_{b}$							
Minimum	6	.00	1.40	1.30	13	23	25
Maximum	64	1.78	2.12	1.95	47	77	107
Mean	29.13_{d}	1.10_{d}	1.72_{d}	1.56_{cd}	28.40_{cd}	43.59_{c}	54.91_{cd}
SD	14.01	.42	.16	.15	7.66	10.65	15.31
Chinese-Australian $_{c}$							
Minimum	3	.00	1.41	1.32	14	20	35
Maximum	64	1.83	2.08	1.90	51	68	104
Mean	29.41_{d}	1.21	1.76	1.64_{b}	31.27_{b}	46.78_{b}	63.88_{b}
SD	12.42	.35	.13	.13	7.65	10.08	13.22
Hong Kong $_{d}$							
Minimum	7	.00	1.54	1.36	16	24	39
Maximum	62	1.73	2.08	1.92	49	73	95
Mean	33.60_{bc}	1.22_{b}	1.80_{b}	1.67_{b}	32.12_{b}	45.34	64.36_{b}
SD	12.63	.38	.13	.13	5.79	8.29	12.00

Note. Australian (*N*=163), Chinese-Australian (*N*=120), Hong Kong (*N*=118). *SIAS:* Social Interaction Anxiety Scale; *SPS*: Social Phobia Scale; *Domain 1:* Disconnection and Rejection; *Domain 2:* Impaired Autonomy and Performance; *Domain 3*: Impaired Limits; *Domain 4*: Other-Directedness; *Domain 5*: Overvigilance and Inhibition.
[a] Variables that have been Log10 transformed.
Subscripts indicate significant differences between samples based on MANOVA analyses.

Schema domains across groups

A MANOVA was conducted, using the GLM procedure, with cultural group (Australian, Chinese and Hong Kong) as the between-subject factor and domains 1 to 5 as the

dependent variables. The MANOVA yielded a main effect for group, $F(4, 398) = 7.74$, $p < .001$. This effect is examined below for domains 1 to 5. Gender was statistically controlled in each of the subsequent analyses. To decrease the risk of Type I error rates when making multiple comparisons, Bonferroni adjustments were applied.

Domain 1. The univariate analysis yielded a significant main effect for group, $F(2, 398) = 10.38$, $p < .001$. Post hoc comparisons revealed that Hong Kong students had significantly higher scores on domain 1 compared to the Australian students, $t(398) = 4.65$, $p < .001$. However, there were no significant differences on domain 1 scores between Chinese-Australian and Hong Kong students, $t(398) = 2.11$, $p = .104$ or Chinese-Australian and Australian students, $t(398) = 2.29$, $p = .081$.

Domain 2. This analysis yielded a significant main effect for group, $F(2, 398) = 12.73$, $p < .001$. Post hoc comparisons revealed that Hong Kong and Chinese-Australian students had significantly higher domain 2 scores than Australian students, $t(398) = 5.13$, $p < .001$, $t(398) = 2.76$, $p = .015$. However, Chinese-Australian and Hong Kong students did not significantly differ on domain 2 scores, $t(398) = 1.94$, $p = .154$.

Domain 3. The univariate analysis yielded a significant main effect for group, $F(2, 398) = 10.87$, $p < 001$. Similarly to domain 2, post hoc comparisons revealed that Hong Kong and Chinese-Australian students had significantly higher domain 3 scores than Australian students, $t(398) = 4.23$, $p < .001$, $t(398) = 2.76$, $p = .015$. However, Chinese-Australian and Hong Kong students did not significantly differ on domain 3 scores, $t(398) = .63$, $p = 1.000$.

Domain 4. This analysis yielded a significant main effect for group, $F(2, 398) = 3.67$, $p = .027$. Post hoc comparisons revealed that Chinese-Australian students had significantly higher domain 4 scores than Australian students, $t(398) = 2.67$, $p = .023$. However, there was no significant difference between Hong Kong and Australian students, $t(398) = 1.47$, $p = .430$ or Hong Kong and Chinese-Australian students, $t(398) = 1.12$, $p = .785$.

Domain 5. The univariate analysis yielded a significant main effect for group, $F(2, 398) = 21.87$, $p < .001$. Similarly to domains 2 and 3, post hoc comparisons revealed that Hong

Kong and Chinese-Australian students had significantly higher domain 5 scores than Australian students, $t(398) = 5.63$, $p < .001$, $t(398) = 5.48$, $p < .001$. However, Hong Kong and Chinese-Australian students did not significantly differ, $t(398) = 0.11$, $p = 1.000$.

Partial Correlations

Partial correlations controlling for gender were conducted between the variables of interest. As seen in Table 3, each of the domains had a moderate to strong positive relationship with both the SIAS and SPS. Each of these correlations were significant at $p < .01$ except for the relationships between the SIAS and domains 3 and 4 for the Hong Kong sample which was significant at $p < .05$.

Table 3
Correlations between YSQ domains and Social Anxiety scales.

	Australian		**Chinese-Australian**		**Hong Kong**	
	SIAS	*SPS* [a]	*SIAS*	*SPS* [a]	*SIAS*	*SPS* [a]
YSQ Domain 1 [a]	.61**	.54**	.57**	.57**	.48**	.53**
YSQ Domain 2 [a]	.62**	.56**	.54**	.56**	.49**	.47**
YSQ Domain 3	.24**	.32**	.32**	.41**	.26*	.35**
YSQ Domain 4	.43**	.45**	.39**	.45**	.26*	.34**
YSQ Domain 5	.57**	.46**	.32**	.38**	.38**	.38**

Note. * $p < 0.05$, ** $p < 0.01$.
Note. SIAS: Social Interaction Anxiety Scale; *SPS*: Social Phobia Scale; *Domain 1:* Disconnection and Rejection; *Domain 2:* Impaired Autonomy and Performance; *Domain 3*: Impaired Limits; *Domain 4*: Other-Directedness; *Domain 5*: Overvigilance and Inhibition.
[a] Variables that have been Log10 transformed.

Early maladaptive schema domains and social anxiety across groups

To examine which of the five domains most strongly related to SIAS and SPS within each of the cultural groups (Australian, Chinese-Australian and Hong Kong) three MANOVAs were conducted using GLM. Each MANOVA was carried out on a separate cultural group with the five schema domains as the independent variables and SIAS and SPS as the dependent variables. Gender was statistically controlled in the following analyses.

Australian. The MANOVA yielded significant main effects for domain 1, $F(2, 155) = 6.14$, $p = .003$, domain 2, $F(2, 155) = 7.79$, $p = .001$ and domain 3, $F(2, 155) = 3.73$, $p = .026$. The main effect for domains 4 and 5 were not significant, $F(2, 155) = .87$, $p = .422$ and $F(2, 155) = 2.23$, $p = .111$, respectively. Table 4 displays the univariate results of this analysis.

As seen in Table 4, there was a significant positive relationship between domain 1 and SIAS, $F(1, 156) = 11.68$, $p = .001$, and between domain 1 and SPS, $F(1, 156) = 6.04$, $p = .015$. Similarly, there was a significant positive relationship between domain 2 and SIAS, $F(1, 156) = 13.72$, $p < .001$, and between domain 2 and SPS, $F(1, 156) = 9.61$, $p = .002$. Domain 3 was only significantly related to SIAS, $F(1, 156) = 5.39$, $p = .022$.

Chinese-Australian. The MANOVA yielded significant main effects for domain 1 $F(2, 112) = 5.50$, $p = .005$, and domain 2, $F(2,112) = 4.04$, $p = .020$. The main effects for domain 3, $F(2,112) = 0.47$, $p = .625$, domain 4, $F(2,112) = 0.24$, $p = .789$ and domain 5, $F(2,112) = 0.19$, $p = .829$, were not significant.

As seen in Table 4, the univariate results revealed a significant positive relationship between domain 1 and SIAS, $F(1, 113) = 10.57$, $p = .002$, and between domain 1 and SPS, $F(1, 113) = 5.55$, $p = .020$. Likewise, there was a significant positive relationship between domain 2 and SIAS, $F(1, 113) = 5.81$, $p = .018$, and between domain 2 and SPS, $F(1, 113) = 6.67$, $p = .011$.

Hong-Kong. The MANOVA yielded significant main effects for domain 1, $F(2, 110) = 4.26$, $p = .016$, and domain 2, $F(2, 110) = 3.21$, $p = .044$. The main effects for domain 3, $F(2, 110) = 1.36$, $p = .261$, domain 4, $F(2, 110) = 1.83$, $p = .166$, and domain 5, $F(2, 110) = .459$, $p = .633$, were not significant.

As seen in Table 4, the univariate results only revealed a significant positive relationship between domain 1 and SIAS, $F(1, 111) = 4.00$, $p = .048$, as well as SPS, $F(1, 111) = 8.27$, $p = .005$ and domain 2 with SIAS, $F(1, 111) = 6.48$, $p = .012$.

Table 4
Univariate MANOVA results.

		B	*t*	*Sig.*	*95% CI*	*Partial* η^2
Australian						
SIAS	Domain 1 [a]	30.57	3.42	.001	[12.90, 48.24]	.07
	Domain 2 [a]	33.38	3.70	.000	[15.58, 51.18]	.08
	Domain 3	-.315	-2.32	.022	[-.58, -.05]	.03
	Domain 4	-.067	-.57	.567	[-.30, .16]	.00
	Domain 5	.145	1.58	.116	[-04, .33]	.02
SPS [a]	Domain 1 [a]	.73	2.46	.015	[.14, 1.31]	.04
	Domain 2 [a]	.92	3.10	.002	[.34, 1.51]	.06
	Domain 3	.00	.06	.952	[-.01, .01]	.00
	Domain 4	.00	.73	.467	[-.01, .01]	.00
	Domain 5	.00	-.40	.687	[-.01, .01]	.00
Chinese-Australian						
SIAS	Domain 1 [a]	37.64	3.25	.002	[14.70, 60.58]	.09
	Domain 2 [a]	25.92	2.41	.018	[4.61, 47.23]	.05
	Domain 3	-.03	-.16	.877	[-.35, .30]	.00
	Domain 4	.04	.25	.801	[-.25, .32]	.00
	Domain 5	-.06	-.59	.557	[-.25, .14]	.00
SPS [a]	Domain 1 [a]	.75	2.36	.020	[.12, 1.38]	.05
	Domain 2 [a]	.77	2.58	.011	[.18, 1.36]	.06
	Domain 3	.00	.73	.467	[-.00, .01]	.01
	Domain 4	.00	.68	.498	[-.00, .01]	.01
	Domain 5	.00	-.16	.872	[-.00, .01]	.00
Hong Kong						
SIAS	Domain 1 [a]	28.53	2.00	.048	[.25, 56.79]	.04
	Domain 2 [a]	32.98	2.55	.012	[7.32, 58.65]	.06
	Domain 3	.143	.68	.499	[-.28, .56]	.00
	Domain 4	-.34	-1.92	.058	[-.69, .01]	.03
	Domain 5	.09	.75	.452	[-.15, .33]	00
SPS [a]	Domain 1 [a]	1.24	2.88	.005	[.39, 2.10]	.07
	Domain 2 [a]	.53	1.35	.179	[-.25, 1.31]	.02
	Domain 3	.01	1.64	.103	[.00, .02]	.02
	Domain 4	-.01	-.96	.339	[-.02, .01]	.01
	Domain 5	.00	-.12	.909	[-.01, .01]	.00

Note. SIAS: Social Interaction Anxiety Scale; *SPS*: Social Phobia Scale; *Domain 1:* Disconnection and Rejection; *Domain 2:* Impaired Autonomy and Performance; *Domain 3*: Impaired Limits; *Domain 4*: Other-Directedness; *Domain 5*: Overvigilance and Inhibition.
[a] Variables that have been Log10 transformed.

Discussion

The present study was the first to compare Hong Kong, Chinese-Australian and Australian samples to determine: (i) whether cross-cultural differences in EMS domains between Chinese (both Hong Kong and Chinese-Australian) compared to Australian samples exist; (ii) which maladaptive schema domains postulated by Young et al. (2003) are associated most strongly with social anxiety in each of the samples; and (iii) whether Hong Kong and Chinese-Australian samples display similar EMS domains, despite the Chinese-Australian sample experiencing a significant life event (i.e. moving to a foreign country).

As predicted, the results revealed that cross-cultural differences between Chinese and Australian samples in EMS domains do exist. Overall, the Hong Kong and Chinese-Australian samples had significantly higher EMS related to domains 2: *Impaired Autonomy and Performance*, 3: *Impaired Limits,* and 5: *Overvigilance and Inhibition.* A possible explanation for the finding that both the Hong Kong and Chinese-Australian samples had comparatively higher scores than the Australian sample related to *Impaired Autonomy and Performance* derives from research indicating that Chinese parents tend to be more over-protective, have more enmeshed relationships with their children, and hold higher standards for their children, particularly academically, compared to their Western counterparts (e.g., Chen et al., 1998). Therefore, Chinese children may grow up to feel as though they are unable to separate, survive or function independently or perform successfully relative to their Western counterparts.

The finding that Hong Kong and Chinese-Australian samples had comparatively higher scores related to *Impaired Limits* than the Australian sample appears to be in conflict with assumed Chinese collectivistic values. These schemas are typically associated with difficulties respecting the rights of others, cooperating with others and having a sense of responsibility to others. It is possible, however, that unlike the *entitlement* subscale which is more in line with individualistic values (i.e. the belief that one is superior to other people, entitled to special rights or privileges, or not bound by the rules of reciprocity) the *insufficient*

self-control/ self-discipline subscale might be endorsed more frequently by Chinese samples given that, in its milder form, there may be cultural pressure to avoid conflict and confrontation which would serve to enhance social harmony. It would be interesting to examine whether future research replicates these findings in Chinese samples.

Finally, the Hong Kong and Chinese-Australian samples also displayed comparatively higher EMS in relation to domain 5, *Overvigilance and Inhibition*. This finding makes sense given research indicating that Chinese individuals tend to constrain their spontaneous actions, feelings and communication (*emotional inhibition*; Chen et al., 1998), strive to meet very high internalised standards, usually to avoid disapproval or shame (*unrelenting standards*; Chen, Dong & Zhou, 1997) as well as hold the conviction that people should be punished for making mistakes (*punitivenenss*; Domino & Hannah, 1987).

Although the aforementioned cross-cultural differences were evident on domains 2, 3 and 5, both similarities and differences between the Chinese and Australian samples were apparent on domains 1 and 4. For instance, while the Hong Kong sample had significantly higher domain 1: *Disconnection and Rejection* scores than the Australian sample, there was no significant difference between the Hong Kong and Chinese-Australian or Chinese-Australian and Australian samples. Likewise, the Chinese-Australian sample displayed significantly higher scores related to domain 4: *Other-directedness* compared to the Australian sample, although there were no significant differences between the Hong Kong and Australian or the Hong Kong and Chinese-Australian samples. Possible explanations for these results include different parenting practices (*Disconnection and Rejection*) in Chinese and Western cultures (see Wu et al., 2002) and an increased focus on the desires, feelings and responses of others to gain approval, as well as maintain one's sense of connection (*Other-directedness*), as a result of the Chinese-Australian sample migrating to a different culture. Given this is the first study to the author's knowledge to compare EMS cross-culturally, future research is necessary to replicate these findings and further examine the relationship between these variables.

Cross-cultural differences in early maladaptive schemas and social anxiety

As hypothesised, the results of the present study indicated that the core beliefs and schemas underlying the *Disconnection and Rejection* domain (1) are related to the SIAS and SPS in each of the samples. That is, individuals who scored higher on the SIAS and SPS tended to have higher schemas related to the expectations that their needs for stable, nurturing and trustworthy relationships would not be met in a predictable manner. Given the interpersonal nature of these EMS it makes sense that these individuals feel anxious in social situations or attempt to avoid them in order to avoid embarrassment or rejection. In line with previous research, these results highlight the possible relationship between *Disconnection and Rejection* schemas and social anxiety, however the present study extends upon extant research by suggesting that this finding is similar in Chinese culture.

Contrary to what was expected, however, schemas from the *Impaired Autonomy and Performance* domain (2) were also associated with the SIAS and SPS within each of the samples, with the exception of the SPS in the Hong Kong sample. These results suggest that individuals who scored higher on the SIAS and SPS had higher EMS related to one's ability to separate and function independently from others. It makes sense that individuals high on *Impaired Autonomy and Performance* schemas would feel socially anxious given that these individuals often feel incompetent, vulnerable to harm and that they are likely to fail. What is more, it is not surprising that this schema domain is apparent in these student samples where individuals are often highly motivated to do well academically. These findings are relevant to schema therapy as they provide preliminary evidence that *Disconnection and Rejection* and *Impaired Autonomy and Performance* schemas should be systematically assessed in clients with social anxiety from both Chinese and Australian cultures.

Given the strict social guidelines in many collectivistic cultures, it is possible that the positive association between domain 2 *Impaired Autonomy and Performance* schemas and the SIAS within the Hong Kong sample suggests that in this sample perceived social interactions as a form of performance in which there is the possibility of failure if they do not conform. As

previously mentioned, this may relate to the parenting practices in collectivist cultures whereby families are regarded as more enmeshed, overprotective and less reinforcing of children for performing competently outside the family (Wu et al., 2002). Interestingly, previous research conducted in Western cultures suggests that individuals higher in social anxiety and SAD symptomatology tend to perceive their parents as either lacking in warmth and rejecting or overprotective (Bruch & Heimberg, 1994; Eastburg & Johnson, 1990; Klonsky, Dutton & Liebel, 1990). Given the association between social anxiety and *Disconnection and Rejection* as well as *Impaired Autonomy and Performance* EMS within each of the samples, future research could examine the relationship between these particular forms of perceived parenting, EMS and social anxiety within Chinese and Australian samples.

The impact of a significant life event on EMS

Overall, although there were no significant differences between the Hong Kong and Chinese-Australian samples when EMS domains were considered independent of social anxiety, differences emerged when social anxiety was taken into account. Although theory and research suggests that EMS are fairly stable constructs (e.g., Riso et al., 2006; Stallard, 2007), it is assumed that they can theoretically be altered via psychotherapy or through other life experiences (Young et al., 2003). Therefore, it is possible that Chinese-Australians' EMS altered in relation to social anxiety as a result of moving to a foreign country that holds more individualistic values. Given the paucity of studies in this field and the cross-sectional nature of this study, however, additional studies are necessary to replicate these findings as well as assess the stability of EMS longitudinally across different life events.

Strengths, limitation and directions for future research

The present study extends extant research by providing the first step towards examining whether cultural variations in Young et al.'s (2003) EMS domains exist and which domains are associated most strongly to social anxiety in Hong Kong, Chinese-Australian and Australian samples. In addition, unlike previous research which typically aggregates Asian samples (e.g., Lau, Fung, Wang, & Kang, 2009), the current study deliberately only recruited

Chinese participants to obtain a more homogenous sample given that cultural differences appear to exist (Iwamasa, 1997). Further, the Chinese-Australian sample received inventories translated into Chinese to avoid priming of individualistic values, and all participants completed companion measures of social anxiety rather than single measures used in previous research. This was particularly relevant given recent research indicating that Chinese individuals tend to somatise their emotional distress due to the stigma attached to publicly discussing psychological symptoms outside the kinship in order to "save face" (Leong & Lau, 2001). Therefore, it is possible that Chinese individuals feel more at ease endorsing items which tend to focus more upon behavioural aspects of social anxiety (SPS) as opposed to more general social interaction anxiety (SIAS).

Despite the aforementioned strengths, several limitations need to be considered in light of the findings. Most notably, the inability to ascribe causality from correlational data makes it hard to determine whether Chinese-Australian students chose to study in Australia due to their schemas related to social anxiety or whether their schematic makeup was influenced by moving to a disparate culture. Such questions may be addressed by future longitudinal research. While many researchers still regard Hong Kong as primarily a Chinese society (see Oyserman et al., 2002) it could be argued that there is a greater Western influence in Hong Kong than in Mainland China where most of the Chinese-Australian sample originated (see Kemmelmeier & Cheng, 2004). As such, it is possible that the comparatively greater Western influence in Hong Kong may have impacted upon the schematic makeup of this sample. Therefore, although the East Asian samples were fairly homogenous in terms of their Chinese heritage, future research should further examine whether any differences exist between Hong Kong and Chinese Mainland samples in relation to social anxiety. It is also important to note that, although each inventory was both forward and back translated, it is plausible that the results could have been influenced by conceptual differences in the meanings of words across cultures rather than cultural factors alone. Therefore, some caution is required when interpreting the findings and suggests that further cross-cultural research in this area is

necessary. Finally, despite efforts to maintain similarities between samples across certain demographic variables (e.g., age, education level) the study participants were a narrow sample whose responses may not be generalizable either to clinical populations with SAD or to a wider demographic.

Clinical Implications

Although these findings need to be replicated and extended in a clinical sample, there are some clinical implications; most notably the importance of considering individuals' cultural background and EMS when assessing and treating social anxiety and SAD. Presently, the assessment, diagnosis and treatment of social anxiety and SAD are primarily guided by Western theoretical explanations of the disorder (Dinnel et al., 2002). As a result, therapists' assessments are often influenced by their own world view and social norms which can lead to misdiagnosis or individuals of Asian background terminating treatment prematurely due to culturally inappropriate or culturally insensitive diagnosis and treatments. Treatment modifications, such as enlisting family involvement in treatment, and clarifying the client's meaning of his or her symptoms during both the assessment and treatment (see Leong & Lau, 2002), may reduce the rate of misdiagnosis and individuals terminating treatment prematurely. Moreover, given that the Chinese samples tended to have higher EMS scores compared to the Australian sample, future research should strive toward demonstrating the utility of the schema therapy model and treatment programs in Asian samples, and next determine whether treatment modifications are necessary.

Conclusion

While Young and colleagues (Young et al., 2003) postulate that culture may contribute to the development of schemas, limited studies have taken culture into account when assessing the relation between EMS and psychiatric symptomatology. Overall, the findings of this study suggest that, for the most part, cultural differences do exist between Chinese and Australian samples independent of social anxiety, although similarities also emerged (particularly the Chinese-Australian and Australian samples) when social anxiety was taken

into account. The present study also provides preliminary evidence that EMS domains remain relatively stable at a broader level despite Chinese-Australian students residing in a foreign country, however some differences emerged between the Hong Kong and Chinese-Australian samples when social anxiety was taken into account. Consistent with previous research, the results revealed that Chinese and Australian individuals experiencing higher levels of social anxiety have higher levels of EMS in the area of *Disconnection and Rejection*. Nevertheless, the findings also highlight the importance of the *Impaired Autonomy and Performance* domain with regards to social anxiety in both Chinese and Australian samples. Although determining the broader schematic structure underlying various disorders is of theoretical and clinical importance, it is important for researchers to go beyond this step and examine how other factors, such as perceived parenting, temperament and unconscious processes, may influence the relationship between EMS and social anxiety.

Chapter 3

The Mediating Role of Early Maladaptive Schemas in the Relationship Between Perceived Parenting and Social Anxiety in Australian and Chinese samples

Author contribution:

Miss Kathleen Mairet was solely responsible for the design of the research, data analysis and write-up of this paper. Dr Simon Boag, Dr Wayne Warburton and Professor Ron Rapee provided research supervision and feedback on the paper. Dr Chee Wing Wong assisted in recruitment of students from the Chinese University of Hong Kong and provided feedback on the paper.

Abstract

This study examined whether early maladaptive schemas (EMS) mediate the relationship between perceived negative parenting practices (i.e. cold or rejecting and overprotective parenting) and social anxiety in an Australian sample (*n* = 163), a Chinese sample residing in Australia (*n* = 120) and a Chinese sample residing in Hong Kong (*n* = 118). The results of the study highlight the relationship between perceived overprotective parenting practices and social anxiety in Australian and Chinese cultures. While parenting practices perceived as cold or rejecting were significantly related to social anxiety in the Australian sample, this form of parenting was less clearly related to social anxiety in the Chinese-Australian sample, and not significantly related in the Hong Kong sample. For the remaining significant analyses, EMS were identified as partial mediators of the relationship between perceived negative parenting and social anxiety in each of the samples. Specifically, the relationship between perceived rejecting in the Australian sample and overprotective parenting for each of the cultural groups in relation to the *Social Interaction Anxiety Scale* (SIAS) was mediated by EMS related to *social isolation, practical incompetence/dependence* and *emotional inhibition*, with some variation across samples. In contrast, the relationship between both perceived rejecting and overprotective parenting and scores on the *Social Phobia Scale* (SPS) was mediated by *abandonment* and *subjugation* EMS in the Australian sample and *enmeshment*, *emotional inhibition* and *emotional deprivation* EMS in the Chinese samples, with some variation between samples. The implications of the findings for both theory and treatment concerning social anxiety are discussed, along with suggestions for future research.[11]

[11] Manuscript submitted for publication. In subsequent chapters this study is referred to as "Mairet, K., Boag, S., Wong, C. W., Warburton, W., & Rapee, R. M. (2014b). *The mediating role of early maladaptive schemas in the relationship between perceived parenting and social anxiety in Australian and Chinese samples*".

Introduction

Social anxiety is characterised by an intense fear of evaluation from others in social situations (Morrison & Heimberg, 2013). As such, expressing opinions, public speaking and socialising are often avoided or endured with discomfort. Although social anxiety is relatively common, individuals who experience severe distress or impairment may meet the diagnostic criteria for social anxiety disorder (SAD), also known as social phobia (American Psychiatric Association [APA], 2013). While a considerable amount of research on social anxiety and SAD has been conducted in Western cultures, a better understanding of the origins of these fears is necessary. As such, research has begun to examine the role of long-standing and self-defeating core themes or patterns, also known as maladaptive schemas, in the aetiology of social anxiety and SAD. Young (1999a) and colleagues' (Young, Klosko, & Weishaar, 2003) schema theory offers a model that relates negative parenting practices and early maladaptive schemas (EMS) to the experience of psychiatric symptomatology in adulthood. However, despite the widespread use of schema therapy in clinical practice, few studies have examined the theoretical pathways proposed or its viability when treating individuals with social anxiety and SAD, particularly from non-Western cultures. Therefore, the aim of this paper is to examine whether EMS mediate the relationship between perceived negative parenting practices and social anxiety. In order to examine whether cross-cultural differences exist, the relationship between these variables will be compared in an Australian sample, a Chinese sample residing in Australia and a Chinese sample residing in Hong Kong.

Social Anxiety and Culture

Cross-cultural research into social anxiety and SAD is still in its infancy with the vast majority of research coming from Western countries. Nevertheless, research indicates that social anxiety and SAD exist in non-Western cultures. However, cultural variation in both the expression of social anxiety and the situations in which it is elicited appear to exist. For instance, *Taijin kyofusho* (TKS) is an expression of SAD which is believed to be prevalent in Japanese and Korean cultures (Hofmann, Asnaani, & Hinton et al., 2010). However, unlike

Western conceptualisations of social anxiety and SAD, in which individuals have a fear of embarrassing *oneself*, individuals experiencing TKS are concerned about behaving in such a way as to offend or embarrass the *other person* (e.g., the fear of eye-to-eye contact).

Research generally indicates that East Asian individuals display higher levels of social anxiety compared to their Western counterparts (e.g., Hsu et al., 2012, Okazaki, 2000), with this difference demonstrated in children as young as two years of age (Rubin et al., 2006). While genetic, developmental and other environmental factors (e.g., traumatic social experiences, being bullied by peers or childhood illness) have been implicated in the development and maintenance of social anxiety and SAD, the family environment is also considered important (Hudson & Rapee, 2000). For example, Hudson and Rapee (2000) suggest three factors that are likely to be important in the family's contribution to social anxiety and SAD, include parental modelling of social concerns, restricted exposure to social situations and the child-rearing styles of the parents. The focus of the current study is on the relationship between child-rearing styles and social anxiety symptomatology in both Australian and Chinese cultures.

Culture and parenting

Culture provides an important contextual source of information that may influence how parents approach child rearing. The ways in which parents interpret, respond to, and shape child behaviour is often in accordance with culturally prescribed expectations and socialisation goals (Chen et al., 1998). For instance, Western cultures tend to promote autonomous self-promoting and assertive behavioural styles that are more in line with individualistic values (Singelis, 1994). As such, children are typically encouraged to be independent and assertive given that acquiring self-reliance, autonomy and assertive social skills are important socialisation goals (Chen et al., 1998). In contrast, East Asian philosophies tend to value a quiet, self-effacing behavioural style including modesty, social harmony and deference to parents which is in line with more collectivistic values (Okazaki,

1997). Therefore, children are generally encouraged to restrain personal desires for the interests of the collective (Chen et al., 1998).

From a young age, Chinese children are also generally required to obey their parents, while parents have the responsibility of governing, disciplining and teaching their children (Chen et al., 1998). Therefore, compared to their Western counterparts, Chinese parents are typically considered more controlling and protective in child rearing in order to ensure a safe environment as well as foster dependency on adults (Wu et al., 2002). This attitude is reflected in the Chinese term "guan" that speaks of governing; it suggests that "parental care, concern, and involvement are synonymous with firm control and governance of the child" (Chao, 1994, p. 1112). Central to the construct of "guan" is the willingness of parents to be directive, whereas Western parenting is seen as more facilitative (Stewart, Bond, Kennard, Ho, & Zaman, 2002).

Culture, parenting and social anxiety

Some parent-child interaction and parenting styles have been linked to child maladjustment in Western cultures. Specifically, socially anxious adult populations tend to perceive their own parents as having been lacking in warmth, less caring, rejecting, more likely to use shame tactics and be overprotective compared to normal controls (e.g., Eastburg & Johnson, 1990; Klonsky, Dutton, & Liebel, 1990). While parental rejection is believed to increase the likelihood of the formation of an insecure attachment, parental overprotection is believed to diminish a child's ability to function and develop independently and consequently increase the chance of psychopathology, such as anxiety (Brook & Schmidt, 2008). Although a number of studies assessing the association between parenting practices and social anxiety have been conducted in Western cultures, comparatively fewer have been carried out in non-Western cultures.

Nevertheless, in a study comparing child-rearing attitudes and behavioural inhibition (a construct related to social anxiety in adults) in Chinese and Canadian toddlers, Chen et al. (1998) found that, compared to Canadian mothers, Chinese mothers were (i) more likely to

encourage their children to achieve, (ii) more punishment orientated, (iii) more rejecting and less accepting of their children, and (iv) more protective of and concerned about their children. Interestingly, the results of this study suggested that inhibition was associated positively with mothers' punishment orientation and negatively with mothers' acceptance and encouragement of achievement within the Canadian sample. In contrast, however, the directions of the relations were opposite in the Chinese sample with child inhibition associated positively with acceptance and encouragement of achievement and negatively with rejection and punishment orientation. It is possible that this finding reflects the different adaptation "meanings" of behavioural inhibition across cultures. For instance, behavioural inhibition, which reflects social anxiety and a lack of confidence in children, is generally regarded as socially immature and psychologically maladaptive in Western cultures (Chen et al., 1998). Within such societies, shy and withdrawn behaviour in children has been associated with social isolation and peer rejection (e.g., Rubin, Chen, McDougall, Bowker, & McKinnon, 1995). In contrast, behavioural inhibition and self-restraint are seen as indicative of mastery, social maturity and accomplishment in Chinese culture (Wu et al., 2002). Therefore, inhibited Chinese children tend to be accepted by their mothers. Nevertheless, some authors argue that social withdrawal is associated with negative outcomes for Chinese children, such as low self-esteem, depression and anxiety, because such withdrawal does not reflect the group-orientated values of a collectivistic culture (Nelson et al., 2006).

Parenting styles, such as high levels of parental rejection and overprotection, have been implicated as possible pathways for the development of social anxiety, particularly in Western studies. However, it still remains unclear whether the same relationship exists in Chinese culture. What is more, it is still not known what variables may mediate the relationship between these parenting styles and psychiatric symptomatology. As such, researchers have begun to examine the role of maladaptive schemas as mediating variables between parenting practices and psychiatric symptomatology, such as social anxiety or SAD. From a clinical

perspective, the ability to identify variables that may mediate this relationship is important given that these might be amenable to treatment.

Early maladaptive schemas and social anxiety

Young (1999a) and colleagues (Young et al., 2003) have integrated the work of Beck (1967) and others (e.g., Ainsworth & Bowlby, 1991) concerning cognitive schemas, hypothesising that maladaptive schemas develop as a result of 'toxic' childhood experiences due to unmet childhood needs including (i) secure attachments to others (including safety, stability, nurturance and acceptance); (ii) autonomy, competence and a sense of identity; (iii) freedom to express valid needs and emotions; (iv) spontaneity and play; and (v) realistic limits and self-control. Young et al. (2003) conceptualise early maladaptive schemas (EMS) as broad, pervasive dysfunctional cognitive and emotional patterns concerning oneself and one's relationship with others which "develop during childhood or adolescence and are elaborated upon throughout one's lifetime" (p. 7). Although EMS might be considered adaptive in the short-term, as they allow children to comprehend their environment, they often outlive their utility in adulthood, leading to anxiety and depression when either real or perceived situations activate the relevant EMS (Young et al., 2003). Based on clinical experience, Young (1999a) proposed 18 EMS that fall into five broad categories or "schema domains" regarding the aforementioned unmet emotional needs. These include *Disconnection and Rejection, Impaired Autonomy and Performance, Impaired Limits, Other-directedness* and *Overvigilance and Inhibition* (see Appendix A).

Theory and research suggests that there is an association between particular EMS and psychiatric symptomatology. For example, a study conducted by Welburn, Coristine, Dagg, Pontefract and Jordan (2002) found that while *abandonment* and *insufficient self-control* were most relevant to depression, *vulnerability to harm*, *abandonment*, *failure*, *self-sacrifice* and *emotional inhibition* were related to anxiety. However, unlike other disorders, such as eating disorders, depression and personality disorders, there is a dearth of research examining the association between EMS and social anxiety or SAD. Nonetheless, a study examining the

EMS associated with agoraphobia and social anxiety in individuals with eating disorders revealed that females with eating disorders and higher levels of comorbid social anxiety had higher *emotional inhibition* and *abandonment* schemas, which accounted for 25.9% of the variance in psychopathology (Hinrichsen, Waller, & Emanuelli, 2004). This study suggests that individuals with social anxiety have a fear that significant others may leave them and that they need to hide their true feelings to avoid disapproval by others. However, given that this study was conducted in a limited sample of females with eating disorders, further research is needed to replicate this finding in a broader population.

In a study comparing the schematic structure of individuals with SAD, other anxiety disorders (obsessive-compulsive disorder and panic disorder) and non-psychiatric controls, Pinto-Gouveia, Castilho, Galhardo and Cunha (2006) found that individuals with SAD had higher levels of all assessed EMS compared to controls, with the exception of *unrelenting standards/hypercriticalness* schemas. Additionally, the results revealed that individuals with SAD were higher than the mixed anxiety group on EMS related to *emotional deprivation, mistrust/abuse, social isolation/alienation, defectiveness/shame, failure, social undesirability/defectiveness, subjugation* and *dependence*. These results suggest that individuals with SAD experience EMS primarily related to Young's (1999a) first domain, *Disconnection and Rejection*. Finally, a study conducted by Calvete and Orue (2008) using a large non-clinical sample examined the relationship between EMS and social anxiety. Here, the EMS subscales of *abandonment, failure* and *emotional inhibition* were associated with social anxiety. This indicates that individuals with social anxiety harbour a fear that significant others may leave them, that they will inevitably fail or that they are inadequate and need to hide their true emotions to avoid disapproval of others.

Consistent with previous research carried out in Western samples, a study conducted by Mairet, Boag, Wong, Warburton and Rapee (2014a) indicated that Chinese and Australian individuals who display higher levels of social anxiety have higher *Disconnection and Rejection* schemas. However, the findings of this study also highlight the importance of the

Impaired Autonomy and Performance domain with regards to social anxiety in both Australian and Chinese samples. Interestingly, these two domains are theoretically related to cold or rejecting and overprotective parenting practices, respectively, which were previously discussed in relation to the development of social anxiety in Western samples.

Parenting and early maladaptive schemas

Although existing parenting measures address family functioning that is related to general psychiatric symptomatology (e.g., the *Parental Bonding Inventory*; Parker, Tupling, & Brown, 1979), the assessment of the relationship between parenting and EMS requires a measure of parenting specifically designed to examine the parental origins of the development of such schemas (Sheffield, Waller, Emanuelli, Murray, & Meyer, 2005). Consequently, Young developed the *Young Parenting Inventory* (YPI; Young, 1999b) based on clinical experience, as a means to measure the most common origins for each maladaptive schema. In a large non-clinical study, Sheffield et al. (2005) examined the link between parenting and EMS. Using a revised version of the YPI, the results suggested that, although there was some variation, parenting appears to have a general effect on EMS, as well as some specific linkage. Therefore, the YPI subscales (except *social isolation/alienation* given that the origins of this EMS are believed to be the result of the peer group) did not map neatly or specifically onto the corresponding subscales of the *Young Schema Questionnaire- Short form* (YSQ; Young, 1998a). While providing valuable information concerning the validity of schema theory, the YPI also presents researchers with an opportunity to investigate the specific link between parenting practices and EMS that are common to general psychopathology as well as prominent in disparate disorders.

Early maladaptive schemas as a mediator of the relationship between perceived parenting and social anxiety

As Sheffield et al. (2005) state, the link between one's early experiences and psychopathology is not always linear. That is, not all securely attached children will be protected from mental health problems while not all insecurely attached children will develop

such problems. The aforementioned authors propose that the research investigating the link between parenting and psychopathology is currently deficient on two levels: "First, there is a lack of clarity regarding the mechanism that links parenting and psychopathology. Second, there is a lack of specificity regarding the role of parenting in the development of different psychopathologies" (Sheffield et al., 2005, p. 788). Young and colleagues (Young, 1999a; Young et al., 2003), however, have provided a useful model to explain the link between parenting and psychopathology.

Several studies have provided evidence that EMS mediate the relationship between perceived negative parenting practices and psychiatric symptomatology (e.g., Carr & Francis, 2010; Harris & Curtin, 2002; Thimm, 2010b; Turner, Rose, & Cooper, 2005). While these studies provide some support for a central tenet of Young's (1999a) theory, to date this relationship has not been examined in relation to social anxiety or SAD. Moreover, the vast majority of studies have been conducted in Western countries which hold more individualistic values. This is unfortunate given that Young et al. (2003) identify culture as a factor that becomes increasingly important as a child matures and thus has an increasing influence on the development of EMS.

Current Study

Young et al.'s (2003) schema theory offers a theoretical approach that links the experience of psychiatric symptomatology in adulthood to negative childhood experiences, cultural influences and provides a mediating psychological mechanism- early maladaptive schemas. As such, the aim of this study is to investigate whether EMS mediate the relationship between perceived rejecting or overprotective parenting and social anxiety. Additionally, this relationship will be compared within an Australian sample and a Chinese sample residing in Hong Kong to see whether any cross-cultural differences exist. A sample of Chinese individuals residing in Australia was also included given previous findings (see Mairet et al., 2014a) suggest that EMS domains remain fairly stable at a broad level, however

they appear to be less stable after a significant life event, such as moving to a disparate culture.

Guided by the schema theory three predictions were proposed. First, there will be a positive relationship between rejecting and overprotective parenting and social anxiety in both Western and Chinese samples. Second, EMS subscales will mediate the relationship between perceived rejecting and overprotective parenting and social anxiety. Finally, cross-cultural differences will exist between the EMS subscales that mediate this relationship between the Australian sample, Chinese sample residing in Australia and Chinese sample residing in Hong Kong. An additional aim of the present study is to examine whether there is a specific link between the EMS subscales of the *Young Parenting Inventory* and *Young Schema Questionnaire*.

Method

Participants

A student sample was utilised for several reasons including (i) research indicating that Chinese individuals are less likely to seek psychological treatment than individuals from Western countries (see Leong & Lau, 2001) making recruitment difficult and; (ii) research suggests that social anxiety and SAD exist along a continuum (e.g., Brook & Schmidt, 2008; Fehm, Beesdo, Jacobi, & Fielder, 2008). Therefore, it is the intensity and life impact of social fears that determines a diagnosis of SAD (Rapee & Spence, 2004).

In terms of cultural makeup, the key concern was ensuring that the samples of interest differed only on cultural factors (Rapee et al., 2011). To this end, three cultural groups were examined. Australian and Chinese undergraduate students were recruited from two urban universities which allowed students to be matched across certain demographic variables, such as education level and age. Given that two of the samples were recruited from Australia, the criteria outlined by Hong and Woody (2007) comparing Euro-Canadian and Korean samples on measures of self-views and social anxiety were applied. As such, each participant identified themselves as being of either Australian (or Chinese) descent or at least third

generation Australian (or Chinese), both spoke and read English (or Chinese) as their first language and had not spent more than seven years in a non-Western country (or Western country, including Australia). The third group were Chinese students from a Hong Kong University defined by the same aforementioned criteria.[12]

Australian sample. This sample consisted of 163 Australian university students (72 male, 91 female) with a mean age of 20.78 years (*SD* = 5.14). Of this sample, 145 participants were born in Australia (89%) while 18 were born elsewhere but identified themselves as being Australian (11%). Participants either received course credit for their participation or had a chance to win a shopping voucher.

Chinese sample residing in Australia. The second sample consisted of 120 Chinese students residing in Australia (32 male, 88 female) with a mean age of 21.65 years (*SD* = 2.55). Of these participants, 107 were born in Mainland China (89%), 6 in Hong Kong (5%) 4 in Taiwan (3%), 1 in Singapore (1%) and 2 in another country but identified themselves as Chinese (2%). Participants were provided the opportunity to enter the aforementioned prize draw for their participation.

Chinese sample residing in Hong Kong. The final sample consisted of 118 Chinese students residing in Hong Kong (58 male, 60 female) with a mean age of 20.84 years (*SD* = 3.22). Twenty-six participants were born in Mainland China (22%), 88 in Hong Kong (74%), 1 in Taiwan (1%), 1 in Singapore (1%) and 2 in another country but identified themselves as Chinese (2%). Students received course credit for their participation.

These three samples will be subsequently referred to as Australian, Chinese-Australian and Hong Kong, respectively. Table 1 presents the relationship status as well as number of friendships and siblings associated with each sample.

[12] Please note that studies 1 and 2, in chapters 2 and 3 respectively, are comprised of the same samples. It is important to note, however, that the aims of each paper and the statistical methods utilised in each are different.

Table 1
Additional Demographic Information

Relationship Status	Single	Dating	Defacto	Married	Widow/er
Australian sample	54 %	37 %	3 %	5 %	1 %
Chinese-Australian sample	69 %	23 %	8 %	0 %	0 %
Hong Kong sample	58 %	40 %	1 %	1 %	0 %
Friendships	None	1 friend	2-5 friends	6-10 friends	11+ friends
Australian sample	1 %	2 %	35 %	28 %	34 %
Chinese-Australian sample	13 %	12 %	67 %	4 %	4 %
Hong Kong sample	3 %	3 %	61 %	24 %	9 %
Siblings	None	1 sibling	2 siblings	3 siblings	4+ siblings
Australian sample	7 %	40 %	31 %	15 %	7 %
Chinese-Australian sample	74 %	17 %	6 %	3 %	0 %
Hong Kong sample	22 %	58 %	13 %	3 %	4 %

Note. Due to cultural differences in relational structures within Australian and Chinese cultures, siblings were identified as individuals born to the same parents rather than cousins or other familial relations. Friends were defined as people the participant would feel comfortable sharing personal problems or concerns with.

Translation process

Research indicates that the language in which an inventory is presented can act as a cognitive cue which influences bilingual individuals' responses to items (Oyserman & Lee, 2008). Further, this finding has been found when the questions do not require any language production on the part of the participant or are close-ended (Kemmelmeier & Cheng, 2004). What is more, Kemmelmeier and Cheng (2004) found that language priming had a greater effect on independent self-construal in bilingual participants residing in Hong Kong than interdependent self-construal. To avoid priming effects, Chinese students residing in both Australia and Hong Kong received each of the inventories written in traditional Chinese characters. As such, documents which required translation into Chinese were carried out by an accredited translator. Documents were then back translated into English by a second bilingual individual. An independent bilingual translator reviewed any discrepancies in order to ensure conceptual equivalence.

Measures

Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS). The SIAS and SPS (Mattick & Clarke, 1998) were developed as self-report companion measures to examine social anxiety fears. The SIAS measures fears of general social interaction, such as mixing in a group (e.g., "I am tense mixing in a group"), while the SPS measures fears of being scrutinised when doing routine activities, such as writing (e.g., "I become anxious if I have to write in front of other people"). The SIAS and SPS each contain 20 items which are rated on a 5 point Likert scale ranging from 0. *not at all characteristic or true of me* to 4. *extremely characteristic or true of me*. The SIAS contains three items which were reverse scored before being summed. The SIAS and SPS have both been found to have excellent coefficient alphas of .90 within a non-clinical sample (Mattick & Clarke, 1998). In the present study, the SIAS and SPS had good to excellent reliability, with coefficient alphas of .93 and .94 in the Australian sample, .88 and .91 in the Chinese-Australian sample, and .91 and .95 in the Hong Kong sample. Although the SIAS and SPS show high inter-correlation (.72), these measures were assessed separately in the current study given that they examine different aspects of social anxiety. This was particularly important given evidence suggesting that there are cultural differences in the manifestation of social anxiety.

Young Schema Questionnaire – Short Form (YSQ - S3). The YSQ-S3 (Young, 2005)[13] is a 90-item self-report inventory that assesses 18 EMS subscales which cluster into five higher-order schema domains: 1. *Disconnection and Rejection*, 2. *Impaired Autonomy and Performance*, 3. *Impaired Limits*, 4. *Other-Directedness* and 5. *Overvigilance and Inhibition*. Each item is comprised of a negative belief concerning oneself and/or one's relationship with others which is rated on a Likert scale from 1. *completely untrue of me* to 6. *describes me perfectly*. Higher scores reflect a participant's greater endorsement of key beliefs known to underlie each EMS (e.g., "I don't belong; I'm a loner"). The YSQ-S3's predecessor,

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the YSQ-S2 (Young, 1994) contains 75 of the 90 items in the YSQ-S3. While the subscales *admiration/recognition seeking*, *pessimism/worry* and *self-punitiveness* are now included in the YSQ-S3, there are few changes to the wording and content of the YSQ-S2 whose psychometric properties have been assessed more rigorously. Although the YSQ-S2 appears robust in Western samples, few studies have been conducted in disparate cultures. The YSQ-S2, has displayed moderate to high internal validity and reliability, with coefficient alphas ranging between .81 and .94 in an Australian sample (Baranoff, Oei, Cho, & Kwon, 2006) and between .71 and .86 in a Chinese sample (Cui, Lin, & Oei, 2011). It is important to note, however, that these results are based upon modified versions of the YSQ-S2 which comprised of 13 and 14 factors, respectively, rather than 15. In the current study, the YSQ-S3 displayed good to excellent reliability coefficients ranging between .77 (*Domain 3*) and .95 (*Domain 1*) in the Australian sample, .77 (*Domain 3*) and .91 (*Domain 1*) in the Chinese-Australian sample and .74 (*Domain 4*) and .93 (*Domain 1*) in the Hong Kong sample. The author's decision to retain each of the 18 subscales from the YSQ-S3 was made given that each subscale was of interest in the current study.

Young Parenting Inventory (YPI -1). The YPI-1 (Young, 2003)[14] is a 72-item self-report inventory that assesses proposed common origins of schemas in terms of early family experiences. Mother and father data from each participant are collected separately on a variety of behaviours that Young et al. (2003) postulate to contribute to the development of each EMS. The YPI-1 uses a 6-point Likert scale ranging from 1. *completely untrue of me* to 6. *describes me perfectly* with higher scores reflecting a participant's greater endorsement of recollected early experiences linked to a particular EMS (e.g., my mother/father "made me feel unloved or rejected"). The exceptions are the five emotional deprivation items which are reverse scored (e.g., my mother/father "loved me, treated me as someone special"). Given that the study was assessing rejecting and overprotective parenting, domains 1: *Disconnection and*

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Rejection and 2: *Impaired Autonomy and Performance* were examined. Subscales within the *Disconnection and Rejection* domain included *abandonment, mistrust/abuse, emotional deprivation and defectiveness/unlovability*. Subscales within the *Impaired Autonomy and Performance* domain include *practical incompetence/dependence, vulnerability to harm or illness, enmeshment* and *failure to achieve*. Although the YPI-1 assesses the same schema subscales as the YSQ-S3, items relating to *social isolation* from domain 1 do not appear in the YPI-1 as Young hypothesised that the origins of this EMS is usually the peer group (Young et al., 2003). Due to ethical requirements, item 11 of the YPI-1 was altered from my mother/father "abused me physically, emotionally, or sexually" to "abused me in some way".

When examining domain 1 *Disconnection and Rejection*, the items demonstrated excellent reliability coefficients of .95 in the Australian sample, .93 in the Chinese-Australian sample and .94 in the Hong Kong sample. In examining domain 2 *Impaired Autonomy and Performance*, the items demonstrated good to excellent reliability coefficients of .88 in the Australian samples, .91 in the Chinese-Australian sample and .94 in the Hong Kong sample. The decision to use the YPI-1 as opposed to the revised YPI-R (Sheffield et al., 2005) was made given that (i) the specific linkage between YPI and YSQ subscales was being examined and (ii) cross-cultural differences were being assessed so the full list of items were retained.

Procedure

The data for this study was collected as part of a broader study. Students completed the inventories online to ensure anonymity and confidentiality, particularly given the stigma around openly discussing perceived parenting in Chinese culture. Participants first completed a demographics questionnaire and then completed the SIAS, SPS, YPI-1 and YSQ-S3. Finally, participants were provided with an Information Form and thanked for their participation.

Results

Statistical Analysis

The present study examined whether EMS mediate the relationship between perceived parental rejection and/or over-protection and social anxiety. The mediation analyses were performed in the manner described by Baron and Kenny (1986) which examines whether: (1) there is an association between the independent variable (i.e. perceived parenting) and the outcome variable (i.e. social anxiety) (Figure 1, *c*); (2) whether there is an association between the independent variable (i.e. perceived parenting) and the mediator (i.e. EMS subscales) (Figure 1, *a*), and (3) whether the mediator (i.e. EMS subscales) is significantly associated with the outcome variable (i.e. social anxiety) when the independent variable (i.e. perceived parenting) is controlled (Figure 1, *b*). Partial mediation exists when the direct effect (*c'*) is significantly decreased after controlling for the mediator while full mediation exists when all three steps are satisfied and the direct effect (*c'*) between the independent variable and outcome variable is reduced to zero after the mediator is included in the model.

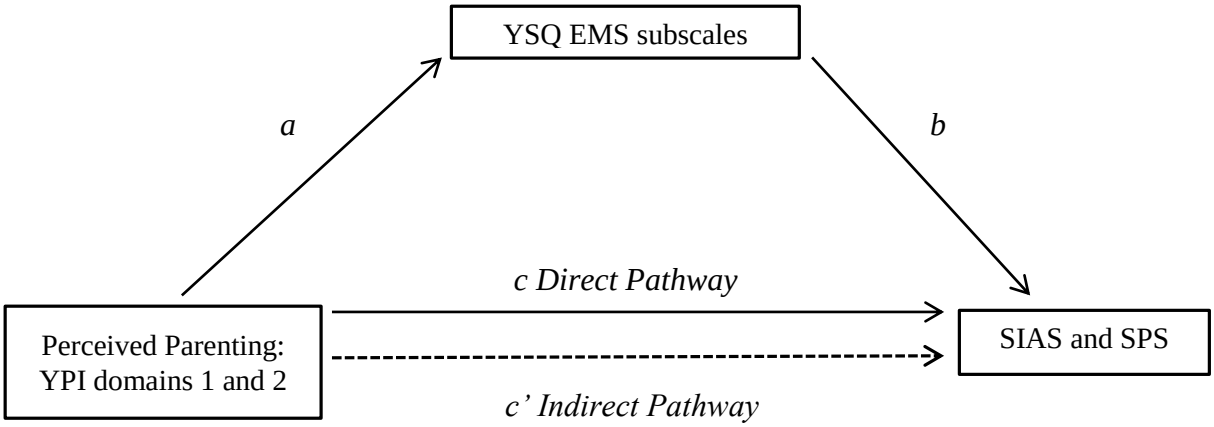

Figure 1. The conceptual mediation model of perceived parenting to social anxiety mediated by early maladaptive schema subscales.

Given the exploratory nature of the study, preliminary data analysis was undertaken before the mediation analysis was performed. Here, correlations examining the relationship between perceived parenting and the SIAS and SPS were assessed. In accordance with Baron and Kenny's (1986) first step, only relationships deemed significant were later examined.

Then analysis of the relationship between each of the EMS subscales and the SIAS and SPS was undertaken in order to reduce the number of YSQ-S3 subscales in subsequent analyses. Again, only those EMS found to be significantly related to social anxiety were further examined. Next, a backward elimination regression on the remaining subscales was used to obtain a reduced set of variables, each of which had a significant association with the SIAS and SPS adjusted for the remaining variables. Following this, the relationship between perceived parenting practices and the remaining EMS were examined. Based upon the above results, mediation analyses were carried out using the remaining variables to assess which EMS subscales mediate the relationship between perceived parenting and the SIAS and SPS within each of the samples.

Preliminary Data Analysis

Statistical analyses were conducted using *Statistical Packages for the Social Sciences* (SPSS v 19). Descriptive statistics for the study variables are presented in Table 2. Small amounts of data were missing at the item level for eight of the 120 Chinese individuals residing in Australia. In order to retain the missing data, all missing data were imputed using the expectation-maximisation (EM) algorithm in SPSS. The EM procedure has been found to be superior to pair-wise deletion, means substitution or list-wise deletion (Allison, 2002; Enders, 2001; Schafer & Graham, 2002). Skewness statistics for the SPS as well as the *Disconnection and Rejection* and *Impaired Autonomy and Performance* domains of the YSQ-S3 as well as the *Disconnection and Rejection* domain of the YPI-1 exceeded the recommended cut off of two times the standard error (Tabachnick & Fidell, 2001) within each sample. These variables were transformed using a Log10 transformation prior to subsequent analyses. Multinomial logistic regression analyses with cultural groups as the dependent variable indicated that there were no significant differences in age across groups [χ^2 (4, N = 401) = 3.73, p = .155]. There was, however, a significant difference in gender, [χ^2 (4, N = 401) = 14.71, p = .001]. Therefore, gender was controlled in each of the analyses reported below.

Table 2
Descriptive statistics for all variables.

	SIAS	SPS[a]	ED[a]	AB[a]	MA[a]	SI[a]	DS[a]	FA[a]	PI/D[a]	VH[a]	EM[a]	ET	IS	SB	SS	AS	NP	EI	US	PU	YPI-D1[a]	YPI-D2
Australian																						
Minimum	6	0	.70	.70	.70	.70	.70	.70	.70	.70	.70	6	5	5	6	5	5	5	8	2	1.53	30
Maximum	64	1.78	1.41	1.48	1.46	1.48	1.43	1.48	1.38	1.41	1.40	27	27	24	30	29	30	28	27	27	2.23	121
Mean	29.13	1.10	.93	1.05	1.06	1.05	.94	.99	.98	.97	.94	14.12	14.28	11.51	16.56	15.52	12.10	12.61	17.52	12.68	1.74	60.35
SD	14.01	.42	.22	.20	.18	.17	.21	.21	.19	.18	.18	4.33	4.71	5.00	4.44	4.98	5.46	5.38	4.69	4.80	.17	18.86
Chinese-Australian																						
Minimum	3	.00	.70	.70	.70	.70	.70	.70	.70	.70	.70	7	6	5	7	5	5	5	7	7	1.53	30
Maximum	64	1.83	1.38	1.41	1.46	1.45	1.38	1.46	1.30	1.45	1.32	28	26	22	27	30	25	27	27	29	2.07	149
Mean	29.41	1.21	1.03	1.12	1.05	1.06	.97	1.07	.99	1.05	.98	15.70	15.57	11.41	16.82	18.56	15.00	13.54	17.75	17.58	1.72	71.31
SD	12.42	.35	.17	.18	.18	.17	.18	.17	.16	.17	.14	4.77	4.34	3.69	4.67	5.43	4.45	4.92	4.64	4.19	.14	21.46
Hong Kong																						
Minimum	7	0.00	.70	.78	.70	.70	.70	.70	.70	.70	.70	9	6	5	7	5	7	5	6	9	1.53	35
Maximum	62	1.73	1.43	1.43	1.41	1.46	1.38	1.46	1.38	1.34	1.36	26	24	22	28	28	25	28	29	27	2.09	120
Mean	33.60	1.22	1.06	1.17	1.10	1.10	1.01	1.09	1.07	1.05	1.00	16.55	15.57	11.99	15.43	17.92	15.41	14.21	17.91	16.83	1.80	71.02
SD	12.63	.38	.16	.14	.16	.15	.18	.16	.16	.17	.16	3.35	3.53	3.70	4.21	4.32	3.72	4.91	4.88	3.44	.14	21.06

Note. Australian (*N*=163), Chinese-Australian (*N*=120), Hong Kong (*N*=118). *SIAS:* Social Interaction Anxiety Scale; *SPS*: Social Phobia Scale; *ED*: emotional deprivation; *AB*: abandonment, *MA*: mistrust/abuse, *SI:* social isolation; DS: defectiveness/unlovability; *FA*: failure to achieve; *PI/D*: practical incompetence/dependence; *VH*: vulnerability to harm; *EM*: enmeshment; *ET*: entitlement/superiority; *IS*: insufficient self-control/self-discipline; *SB*: subjugation; *SS*: self-sacrifice; *AS*: admiration/recognition seeking; *NP*: pessimism/worry; *EI:* emotional inhibition; *US*: unrelenting standards; *PU*: self-punitiveness; *YPI-D1*: YPI domain 1: Disconnection and Rejection; *YPI-D2*: YPI domain 2: Impaired Autonomy and Performance.

[a] Variables that have been Log10 transformed.

Perceived parenting and social anxiety (IV to DV correlation)

Gender was statistically controlled in each of the subsequent analyses. As seen in Table 3, domain 1 of the YPI (i.e. *Disconnection and Rejection*) was positively associated with the SIAS and SPS. This relationship was not significant, however, for Hong Kong students on either the SIAS or SPS. Similarly, the relationship between domain 1 and the SIAS was not significant for Chinese-Australian students. Domain 2 of the YPI (i.e. *Impaired Autonomy and Performance*) was both positively and significantly associated with the SIAS and SPS for each of the samples. Non-significant relationships were ruled out from later mediation analyses.

Table 3
Partial correlations between YPI domains 1 and 2 and Social Anxiety scales controlling for gender.

	Australian		**Chinese-Australian**		**Hong Kong**	
	SIAS	*SPS*[a]	*SIAS*	*SPS*[a]	*SIAS*	*SPS*[a]
YPI domain 1[a]	.17*	.19**	.14	.21*	.15	.13
YPI domain 2	.20**	.34**	.29**	.37**	.37**	.37**

Note. * $p < 0.05$, ** $p < 0.01$.
SIAS: Social Interaction Anxiety Scale; *SPS*: Social Phobia Scale; *YPI domain 1*: Disconnection and Rejection; *YPI domain 2*: Impaired Autonomy and Performance.
[a] Variables that have been Log10 transformed.

Early maladaptive schemas and social anxiety (MV to DV correlation)

Given the exploratory nature of the study, the relationship between EMS subscales and the SIAS and SPS were first examined using partial correlations controlling for gender within each of the samples to identify significant relationships.

Table 4
Partial correlations between YSQ subscales and Social Anxiety Scales for each sample.

	Australian		Chinese-Australian		Hong Kong	
YSQ Subscale	*SIAS*	*SPS*[a]	*SIAS*	*SPS*[a]	*SIAS*	*SPS*[a]
AB[a]	.50**	.48**	.33**	.45**	.39**	.42**
MA[a]	.45**	.48**	.37**	.44**	.30**	.37**
ED[a]	.47**	.37**	.43**	.37**	.31**	.47**
DS[a]	.57**	.45**	.56**	.50**	.46**	.50**
SI[a]	.58**	.45**	.54**	.42**	.49**	.42**
PI/D[a]	.57**	.47**	.51**	.48**	.45**	.30**
VH[a]	.44**	.44**	.36**	.46**	.36**	.49**
EM[a]	.37**	.37**	.42**	.48**	.47**	.46**
FA[a]	.55**	.47**	.42**	.38**	.30**	.26**
ET	.02	.18*	.23*	.29*	.05	.24*
IS	.36**	.36**	.31*	.40**	.37**	.35**
SB	.57**	.53**	.53**	.46**	.47**	.39**
SS	.14	.17*	.11	.25**	-.07	.13
AS	.22**	.29**	.27**	.32**	.16	.20*
P/W (NP)	.53**	.46**	.36**	.39**	.26*	.37**
EI	.60**	.42**	.53**	.54**	.67**	.43**
US	.09	.14	.01	.07	-.04	.09
PU	.44**	.34**	-.01	.07	.14	.15

Note. * $p < 0.05$, ** $p < 0.01$
SIAS: Social Interaction Anxiety Scale; *SPS*: Social Phobia Scale; *ED*: emotional deprivation; *AB*: abandonment, *MA*: mistrust/abuse, *SI:* social isolation; *DS*: defectiveness/unlovability; *FA*: failure to achieve; *PI/D*: practical incompetence/dependence; *VH*: vulnerability to harm; *EM*: enmeshment; *ET*: entitlement/superiority; *IS*: insufficient self-control/self-discipline; *SB*: subjugation; *SS*: self-sacrifice; *AS*: admiration/recognition seeking; *NP*: pessimism/worry; *EI:* emotional inhibition; *US*: unrelenting standards; *PU*: self-punitiveness.
Note. [a] Variables that have been Log10 transformed.

As seen in Table 4, the majority of EMS subscales display both positive and significant relationships with the SIAS and SPS, except *unrelenting standards* which revealed a non-significant relationship within each of the samples. Although *self-punitiveness* displayed both a positive and significant relationship with the SIAS and SPS within the Australian sample, it was non-significant within both the Chinese-Australian and Hong Kong samples. *Self-sacrifice* did not display a significant relationship with the SIAS within any of the samples, nor with the SPS within the Hong Kong sample, while *entitlement* did not have a significant relationship with the SIAS within the Australian or Hong Kong sample. Finally, within the Hong Kong sample *admiration/recognition seeking* displayed a non-significant relationship with the SIAS.

To investigate which EMS subscales related most significantly to social anxiety over and above the remaining EMS subscales, EMS subscales that displayed significant relationship to the SIAS and SPS were subsequently examined using a backward elimination regression procedure. Here, EMS subscales were entered as the independent variables while the SIAS and SPS were the dependent variables. Given the large number of variables, a stringent cut-off of .01 was applied. Therefore, only EMS with a *p* value <.01 were retained and used in subsequent analyses. Table 5 presents the EMS significantly associated with the SIAS and SPS. These were included in later mediational analyses.

Table 5
Backward elimination analysis using EMS subscales to predict social anxiety scores. Partial correlations between EMS subscales and YPI-1 domains 1 and 2.

		Backward elimination		**Bivariate correlations**	
	YSQ Subscales	*β(stand)*	*95% CI*	***YPI domain 1***[a]	***YPI domain 2***
Predictors of SIAS					
Australian	SI [a]	.23	[7.06, 29.87]	.41**	.31**
	PI/D [a]	.35	[16.93, 35.49]	.23*	.41**
	EI	.29	[.45, 1.17]	.27**	.14
Chinese-Australian	SI [a]	.25	[5.75, 30.98]	.27*	.32**
	PI/D [a]	.29	[10.76, 34.81]	.22*	.33**
	EI	.29	[.32, 1.15]	.15	.34**
Hong Kong	PI/D [a]	.23	[6.38, 29.89]	.22*	.49**
	EI	.57	[1.08, 1.83]	.33**	.47**
Predictors of SPS [a]					
Australian	AB [a]	.26	[.20, .89]	.23*	.31**
	SB	.37	[.02, .04]	.27**	.41**
Chinese-Australian	EM [a]	.33	[.430, 1.18]	.27*	.47**
	EI	.44	[.02, .04]	.15	.34**
Hong Kong	ED [a]	.32	[.34, 1.14]	.38**	.33**
	EM [a]	.33	[.39, 1.22]	.30**	.58**

Note. *$p < .01$. ** $p < .001$.
SIAS= Social Interaction Anxiety Scale, *SPS*=Social Phobia Scale; *YPI-D1*: YPI domain 1: Disconnection and Rejection; *YPI-D2*: YPI domain 2: Impaired Autonomy and Performance; *PI/D*: practical incompetence/dependence; *EI:* emotional inhibition; *SI:* social isolation; *AB*: abandonment; *SB*: subjugation; *EM*: enmeshment; *ED*: emotional deprivation.
[a] Variables that have been Log10 transformed.

IV to MV correlation

Table 5 displays the partial correlations controlling for gender between the remaining EMS subscales and perceptions of parenting as assessed by the two YPI domains. For the most part, there were positive and significant relationships between perceptions of parental *Disconnection and Rejection* (YPI domain 1) and *Impaired Autonomy and Performance* (YPI domain 2) and the remaining EMS subscales. In relation to the SIAS, non-significant relationships were evident between *Disconnection and Rejection* and *emotional inhibition* in the Chinese-Australian sample and *Impaired Autonomy and Performance* and *emotional inhibition* in the Australian sample. Finally, when considering SPS, only the relationship between *Impaired Autonomy and Performance* and *emotional inhibition* was not significant in the Chinese-Australian sample. EMS subscales that did not yield a significant association with the independent variable (YPI domain) in mediation analyses were removed. In relation to the SIAS and YPI domain 2 this includes *emotional inhibition* in the Australian sample. In relation to the SPS and YPI domain 1 this includes *emotional inhibition* in the Chinese-Australian sample.

Mediation analyses

To test whether the aforementioned EMS subscales (as measured by the YSQ-S3), mediate the relationship between recollected experiences of negative parenting in the two YPI domains, and social anxiety (as measured by the SIAS and SPS), results were again analysed using the procedure outlined by Baron and Kenny (1986). To this end, significant IV-MV; IV-DV and MV-DV relationships were formally assessed.

Research suggests that non-parametric approaches (e.g., bootstrapping) offer the best method to test the significance of a mediator (Preacher & Hayes, 2004). Bootstrapping is frequently preferred over the product of coefficients (*ab* or *c-c'*) Sobel test because it maintains reasonable control over the Type I error rate, does not rely on a normal distribution and does not rely on sample size (Preacher & Hayes, 2004). Bootstrapping randomly generates a large number of samples from the existing data, and computes an indirect effect

(*ab*) in each sample (Preacher & Hayes, 2004). This random sampling is then used to generate confidence intervals for the indirect effect. Therefore, within the context of Baron and Kenny's (1986) mediational framework, Preacher and Hayes' (2004) SPSS PROCESS macro was applied in the current study with a bootstrapping procedure using 5,000 bootstrap samples and a 95% confidence interval (CI). According to Hayes (2009), if the 95% CI does not include zero then the indirect effect is significant.

Table 6 provides a summary of the results of all mediation analyses, controlling for gender. As can be seen, although there was some variation in EMS assessed across samples, the results suggest that EMS mediate the relationship between perceived disconnected or rejecting parenting practices and social anxiety, as measured by the SIAS and SPS. Although significant, given that direct effect (*c'*) between the independent variable (i.e. perceived parenting) and outcome variable (i.e. the SIAS and SPS) did not get reduced to zero after the mediator/s (i.e. EMS subscales) were included in the model, these results suggest partial mediation.

Table 6

Summary of regression models testing for EMS subscales as mediators between perceived parenting and social anxiety symptoms.

Variable	IV-DV (c)		IV-MV (a)		MV-DV		A*B (Indirect)	
	β	95% CI	*β*	95% CI	*β*	95% CI	Effect	95% CI
SIAS (DV)								
YPI domain 1: Disconnection and Rejection (IV)								
MVs Australian								
[a]SI	14.20*	[1.32, 27.07]	.43**	[.28, .58]	21.91**	[10.24, 33.57]	9.33*	[3.52, 15.90]
[a]PI/D	14.20*	[1.32, 27.07]	.26*	[.09, .43]	24.89**	[15.68, 34.10]	6.40*	[2.39, 12.18]
EI	14.20*	[1.32, 27.07]	8.8**	[3.95, 13.72]	.85**	[.50, 1.21]	7.54*	[2.95, 14.42]
YPI domain 2: Impaired Autonomy and Performance (IV)								
MVs Australian								
[a]SI	.15*	[.03, .26]	.003**	[.001, .004]	33.60**	[23.25, 43.96]	.09*	[.05, .15]
[a]PI/D	.15*	[.03, .26]	.004**	[.003, .01]	31.34**	[21.20, 41.48]	.13*	[.07, .19]
MVs Chinese-Australian								
[a] SI	.17*	[.07, .27]	.001**	[.001, .004]	18.18*	[5.34, 31.03]	.05*	[.01, .10]
[a]PI/D	.17*	[.07, .27]	.001**	[.001, .004]	22.48**	[10.06, 34.90]	.05*	[.03, .10]
EI	.17*	[.07, .27]	.08**	[.04, .12]	.73**	[.29, 1.15]	.06*	[.02, .13]
MVs Hong Kong								
[a]PI/D	.22**	[.12, .32]	.004**	[.002, .005]	16.19*	[3.55, 28.83]	.06*	[.01, .12]
EI	.22**	[.12, .32]	.11**	[.07, .15]	1.50**	[1.10, 1.90]	.16*	[.10, .25]

SPS (DV)[a]								
YPI domain 1: Disconnection and Rejection (IV)								
MVs Australian								
[a]AB	.48*	[.10, .86]	.27*	[.09, .45]	.52*	[.16, .88]	.14*	[.03, .32]
SB	.48*	[.10, .86]	8.00**	[3.41, 12.51]	.03**	[.02, .04]	.24*	[.09, .44]
MVs Chinese-Australian								
[a]EM	.53*	[.07, .99]	.28*	[.10, .46]	1.12**	[.71, 1.54]	.31*	[.11, .61]
YPI domain 2: Impaired Autonomy and Performance (IV)								
MVs Australian								
[a]AB	.01**	[.004, .01]	.003**	[.002, .005]	.51*	[.15, .86]	.002*	[.0004, .003]
SB	.01**	[.004, .01]	.11**	[.07, .15]	.03**	[.01, .04]	.003*	[.001, .01]
MVs Chinese-Australian								
[a]EM	.01**	[.003, .01]	.003**	[.002, .004]	.73**	[.31, 1.14]	.004*	[.001, .004]
EI	.01**	[.003, .01]	.08**	[.04, .12]	.03**	[.02, .04]	.002*	[.001, .004]
MVs Hong Kong								
[a]ED	.01**	[.004, .01]	.001**	[.001, .004]	.77**	[.36, 1.18]	.002*	[.001, .004]
[a]EM	.01**	[.004, .01]	.004**	[.003, .01]	.59*	[.10, 1.08]	.003*	[.001, .01]

Note. *$p < .05$. ** $p < .001$. Indirect paths were deemed significant at the .05 level when the 95% CI did not include zero. Gender has been controlled in each of these analyses.

SIAS= Social Interaction Anxiety Scale, *SPS*=Social Phobia Scale; *SI:* social isolation; *PI/D*: practical incompetence/dependence; *EI:* emotional inhibition; *ED:* emotional deprivation; *AB*: abandonment; *SB*: subjugation; *EM*: enmeshment.
[a] Variables that have been Log10 transformed.

Discussion

The present study examined the mediating role of early maladaptive schemas (EMS) in the relationship between perceived negative parenting practices (i.e. cold or rejecting and overprotective parenting) and social anxiety in an Australian, Chinese-Australian and Hong Kong sample. Within each sample, EMS were identified as partial mediators of the relationship between perceived negative parenting and social anxiety, however there were some cross-cultural variations in the relationships between perceived parenting practices and social anxiety as well as the EMS that mediated this relationship.

The relationship between perceived parenting and social anxiety

Consistent with previous studies primarily conducted in Western cultures, the current study found a relationship between perceived overprotective parenting practices and social anxiety in both Australian *and* Chinese cultures. As previously mentioned, overprotective parenting practices are believed to diminish a child's ability to explore their environment and learn new skills independently which may, in fact, increase levels of anxiety in new or unfamiliar situations (Brook & Schmidt, 2008). This makes sense within Western cultures, such as Australia, where individuals are encouraged to be autonomous and assertive. However, this finding is interesting given research indicating that there is a greater acceptance of controlling and overprotective parenting in Chinese culture (Wu et al., 2002). Despite whether an overprotective parenting style is accepted within a culture or not, this finding underscores the apparent role that parental overprotection plays in the onset and maintenance of social anxiety. Considerable conjecture remains, however, about whether Chinese individuals with social anxiety experience the same level of distress compared to individuals from Western cultures given that East Asian philosophies tend to value a quiet, self-effacing behavioural style. Nevertheless, recent evidence tends to suggest that Chinese individuals residing in Eastern as well as Western countries tend to experience equal, if not greater, distress levels than their Western counterparts (e.g., Lee, Okazaki, & Yoo, 2006). It is possible that in cultures where socially withdrawn behaviours are viewed more positively

(e.g., Chinese), parents and social norms may encourage introverted behaviour during a children's development such that shy children are less likely to learn strategies to overcome their social anxiety (Heinrichs et al., 2006).

Contrary to expectations, while parenting practices perceived as cold or rejecting were significantly related to fears of social interaction (as measured by the SIAS) and fears of social scrutiny (as measured by the SPS) in the Australian sample, this form of parenting was only related to fears of social scrutiny in the Chinese-Australian sample, with no significant relationship identified in the Hong Kong sample. It is possible that perceived cold or rejecting parenting may have increased the likelihood of the formation of an insecure attachment in Australian individuals and consequently heightened the chances of developing social anxiety.

In the Chinese samples, parenting practices that were perceived as impairing a child's sense of autonomy had a stronger association with social anxiety than parenting that was perceived as cold or rejecting. A possible explanation for this finding may be that the norms governing parenting practices vary by culture according to the meanings that are attached to them. For example, while shaming and love withdrawal are considered detrimental to a child's self-esteem in Western culture, Wu et al. (2002) suggests that Chinese parents often use these strategies to promote sensitivity towards the feelings of others and to foster adherence to social norms which are both valued attributes in collectivistic cultures.

Alternatively, it is possible that although children from both Western and Eastern cultural backgrounds share similar core emotional needs, as Young et al. (2003) suggest (e.g., forming secure attachments, autonomy, freedom to express valid needs and emotions, spontaneity and play, as well as realistic limits), the ways in which parents fulfil these needs may differ cross-culturally. While verbal and physical affection in the form of hugging, touching and kissing are seldom displayed in Chinese compared to Western culture, parental warmth may instead be expressed through other subtle and/or symbolic gestures, such as gift giving (Liu & Guo, 2010). If this is the case, then it is possible that certain questions in parenting inventories, such as the *Young Parenting Inventory* (e.g., my mother/father "was

warm and physically affectionate"), which are based on Western conceptualisations of parenting practices, may not adequately capture these alternate displays of intimacy.

Do EMS mediate the relationship between perceived parenting and social anxiety?

Similar to extant research examining the link between maladaptive schemas and various psychopathologies (e.g., Welburn et al., 2002), there was a significant relationship between the majority of EMS examined and social anxiety (see Table 4). Concomitant with Young et al.'s (2003) schema model, findings from the mediation analyses suggest that the effects of perceived rejecting or overprotective parenting practices on social anxiety in adulthood are mediated by EMS, however see the limitations section below. Nevertheless, given that direct effects between the independent variable (i.e. perceived parenting) and outcome variable (i.e. the SIAS and SPS) did not get reduced to zero after the mediators (i.e. EMS subscales) were included in the model, the results suggest partial mediation. Previous studies have found a relationship between EMS and social anxiety (e.g., Calvete & Orue, 2008; Hinrichsen et al., 2004) and this study replicated this finding and extended it by finding that such schemas in fact mediated the effect of rejecting or overprotective parenting on fears related to social isolation. Given that parents who are perceived to be either cold and rejecting or are overprotective may not expose their children to certain social situations, either because they do not spend quality time with their children or do not think their child is capable of functioning independently in certain social situations, it makes sense that these individuals may feel different or isolated from the rest of the world (*social isolation*). Consequently, these individuals may feel more dependent on others (*practical incompetence/ dependence*) and try to inhibit their emotions in order to avoid disapproval or further rejection (*emotional inhibition*).

Interestingly, although Young et al. (2003) propose that the *social isolation* schema usually develops later in childhood or during adolescence, is "generally not as pervasive or as powerful" and "may not reflect the dynamics of the nuclear family" (p. 10), *social isolation* was one of three EMS that appeared to mediate the relationship between perceived rejecting

parenting and social interaction anxiety in the Australian sample and overprotective parenting and social interaction anxiety in each of the samples. If this schema does, in fact, develop later in life it may explain its manifestation in the relationship between overprotective parenting and social interaction anxiety for the Chinese-Australian, as opposed to Hong Kong, sample given that these individuals have recently moved from their friends and family to a foreign country and appear to have fewer close friends (see Table 1). Considerable demands would be placed on immigrants to navigate intergroup interactions and manage the stressors of potential discrimination as well as stereotyped expectations which could also magnify one's sense of social isolation. Further examination of the *social isolation* EMS warrants further examination employing a longitudinal study design.

The relationship between both perceived rejecting and overprotective parenting and fear of social scrutiny (as measured by the SPS) were mediated by *abandonment* and *subjugation* schemas in the Australian sample and *enmeshment*, *emotional inhibition* and *emotional deprivation* EMS in the Chinese samples, with some variation between samples. Compared to the SIAS, the SPS scores revealed greater cross-cultural variation and appear to reflect more the parenting practices associated with each sample. Results indicating the primary roles of *abandonment* and *subjugation* within Australian individuals that are high on social anxiety are compatible with Beck et al.'s (1985) supposition that schemas regarding abandonment or the loss of love by others frequently underlie social fears. Social anxiety is likely to be higher when one holds the expectation that significant others will abandon them while the suppression of one's own feelings, preferences, and desires (i.e. subjugation) could represent a strategy employed by the individual in order to try to circumvent the possibility of abandonment.

In contrast, results indicated a key role for *enmeshment* schemas in terms of the relationship between scores on the SPS and perceived rejecting and overprotective parenting for the remaining Chinese analyses. This finding is congruent with previous research suggesting that Chinese parents, particularly mothers, are immensely devoted to their

children, especially during the early years (Wu et al., 2002). Ideas involving the child being the sole interest and concern of the mother, being taken everywhere with the mother and being in the constant care of the mother are ideas often noted in Chinese literature (Chao, 1994). What is more, the results of the study suggest that Chinese families have fewer children (see Table 1), conceivably due to the one child policy evidenced in Mainland China. It is plausible that such an intense bond between a child and their parent/s may create excessive emotional involvement that could hinder the full individualisation of the child and thus normal development in terms of social confidence (Young et al., 2003).

Interestingly, despite the *enmeshment* schema featuring within the Chinese-Australian sample, these students either decided themselves to study in a foreign country or were encouraged to do so by their parents, presumably to increase their education or employment prospects. In addition to the *enmeshment* EMS, the Chinese-Australian sample displayed higher *emotional inhibition* EMS. It seems plausible that individuals from collectivistic societies are encouraged to inhibit spontaneous actions, feelings or communications in order to maintain social harmony. Moreover, deference to parents is valued in such a culture so the inhibition of spontaneous thoughts or actions makes sense within such a context. However, given that this schema was not identified as strongly in the Hong Kong sample, an alternative explanation might be that these individuals are residing in a foreign country with different social norms and values so they are more likely to inhibit their thoughts or actions in order to gain social approval.

While *enmeshment* and *emotional inhibition* schemas mediated the relationship between perceived overprotective parenting and scores related to fear of social scrutiny in the Chinese-Australian sample, *enmeshment* and *emotional deprivation* schemas mediated the same relationship in the Hong Kong sample. According to Young et al.'s (2003) theory, these results suggest that, despite Hong Kong individuals having enmeshed relationships with significant others, they do not feel emotionally supported either due to an absence of attention, affection, warmth and/or empathy. Therefore, individuals from this sample may feel

as though one's desire for a normal degree of emotional support will not be adequately met by others (Young et al., 2003). Alternatively, it is possible that the items of the YSQ may not adequately capture the ways in which Chinese individuals express affection, warmth or empathy to significant others. Given the widespread use of schema therapy, future studies should examine the ability for such inventories to be applied and interpreted when working with individuals from non-Western cultures.

The link between the Young Schema Questionnaire and Young Parenting Inventory subscales

An additional aim of the study was to examine whether a specific link between the schema subscales of the YPI and the corresponding schema measures from the YSQ exist. Consistent with Sheffield et al.'s (2005) study, parenting appeared to have a general effect on EMS, as well as some specific linkage. Overall, the YPI subscales did not map specifically onto the corresponding subscales of the YSQ. Rather, the findings are consistent with the proposition that perceptions of parenting may make the individual more susceptible to developing a cluster of negative schemas, as opposed to a single EMS.

Strengths, limitations and directions for future research

The current study makes a significant contribution to the field as it provides an examination of the theoretical pathways involved in schema theory in relation to social anxiety. Further, this is the first study to examine the theory's applicability in Australian, Chinese-Australian and Hong Kong samples. Other strengths of the study include the use of both the *Social Interaction Anxiety Scale* (SIAS) and *Social Phobia Scale* (SPS). The current study indicates that valuable information is evidenced when both companion measures are utilised when assessing cross-cultural differences in social anxiety rather than single measures used in previous research. An additional strength of the study is that each inventory was forward and back translated into Chinese in order to circumvent priming effects, predominantly of individualistic values. Finally, the inventories were presented online which

may have allowed Chinese individuals to discuss their relationships with their parents more openly than in face-to-face interviews.

Although this study contributes to our understanding of the relationship between perceived negative parenting practices, EMS and social anxiety in disparate cultures, there are several limitations. Most notably, the current study has not been carried out longitudinally which limits the ability to ascribe causality. Although this study provides preliminary evidence regarding the relationship between these factors cross-culturally, future longitudinal research is required. Longitudinal research may also clarify the direction of effects. For instance, it is plausible that social anxiety predicts perceived parenting and that this relationship may be mediated by EMS. Another limitation is the reliance upon retrospective reports regarding negative parenting practices which could be susceptible to biases, such as memory limitations, recent experiences with parents and mood. Nevertheless, recollections of parenting practices have been found to be highly stable despite changing mood state (Lizardi & Klein, 2005). Furthermore, it could be argued that the individual's experience of parenting is more important than objectively measured parenting characteristics (Parker, 1989).

Third, despite the widespread use of the *Young Parenting Inventory* in clinical settings, there is a paucity of studies examining the psychometric properties of this scale, particularly in non-Western cultures. Although it was not the aim of the present study, future studies, similar to Sheffield et al. (2005), should continue to assess reliability and validity of this scale. Importantly, the utility of this inventory, in addition to the *Young Schema Questionnaire*, should be further evaluated in in non-Western cultures. Although beyond the scope of the current study, future research would also benefit from assessing the relationship between these variables for mothers and fathers separately. Restrictions in sample composition also reduce the generalisability of the findings. Future research with a more representative sample would be valuable.

Conclusion

A major limitation of the existing literature concerning schema therapy theory and practice is the heavy reliance on data from Western nations. This is important because schema therapy, which is growing in popularity, is based on a number of assumptions that have not been tested cross-culturally. In essence, the results of this study suggest that EMS do partially mediate the relationship between perceived rejecting and overprotective parenting practices and social anxiety in Australian and Chinese individuals. Thus, it would be valuable to routinely assess the relevant EMS in individuals who present with social anxiety in clinical settings.

Nevertheless, cross-cultural differences also appear to exist. For instance, unlike the Australian sample, parenting practices that are perceived as impairing a child's sense of autonomy had a stronger association with social anxiety than parenting that is perceived as cold or rejecting in the Chinese samples. These findings suggest that culture does influence the relationship between these variables, and thus needs to be taken into consideration when working clinically with individuals from different cultural backgrounds. The study also emphasises the need to further evaluate the reliability and validity of certain inventories which are based upon Western conceptualisations of positive and negative parenting practices. Although it is hoped that this study has contributed to our understanding of the interplay between parenting, EMS, social anxiety and culture, it is still necessary to form a greater understanding of the role of non-parental and cultural factors in the development of EMS.

Chapter 4

How Important is Temperament? The Relationship Between Coping Styles, Early Maladaptive Schemas and Social Anxiety

Author contribution:

Miss Kathleen Mairet was solely responsible for the design of the research, data analysis and write-up of this paper. Dr Simon Boag and Dr Wayne Warburton provided research supervision and feedback on the paper.

Abstract

Young's schema theory provides a theoretical framework that relates temperament, coping styles and early maladaptive schemas to social anxiety and social anxiety disorder (SAD). The current study explored the relationship between these variables in a sample of 360 non-clinical adults. Results indicated that individuals higher in social anxiety display higher levels of schemas themed around *Disconnection and Rejection* than individuals low in social anxiety. Temperament appears to influence the type of coping style some individuals adopt with more introverted individuals utilising more avoidant strategies. Nevertheless, neuroticism appears to have a stronger relationship with *Disconnection and Rejection* schemas than coping strategies linked to either avoiding or overcompensating for stressors. Path analysis was used to test three models of the data based on the relationships proposed by Young and colleagues. Results provide preliminary evidence that the impact of maladaptive schemas on coping strategies is stronger than the influence of coping strategies on such schemas. The implications of the findings for both theory and treatment concerning social anxiety and SAD are discussed, along with suggestions for future research.[15]

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Introduction

Social anxiety disorder (SAD) is a condition characterised by a persistent fear of social or performance situations, fear of negative evaluation and the avoidance of situations which may trigger such fears (American Psychiatric Association [APA], 2000). SAD is currently the most common anxiety disorder and the third most common psychiatric disorder (Brook & Schmidt, 2008) with a poor rate of spontaneous remission (Bruce et al., 2005). Although a large body of research on social anxiety and SAD exists, a better understanding of the origins of such fears is needed. Accordingly, research has begun to focus upon the role that various types of knowledge structures (i.e. schemas) play in social anxiety's aetiology. A relevant framework is provided by Young (1999a) and colleagues (Young, Klosko, & Weishaar, 2003) in their theory of the development and impact of maladaptive schemas. According to Young et al. (2003), emotional temperament is considered "especially important" (p. 11) in the development of such schemas and is "one of the main factors" that determine individuals' coping styles (p. 35). However, despite the wide-spread clinical utilisation of schema therapy for various disorders, including chronic anxiety, limited research has been carried out on the pathways theorised by Young's schema model and its viability when treating individuals with social anxiety and SAD.

Schema Therapy and Early Maladaptive Schemas

Integrating the work of Beck (1967) and others (e.g., Ainsworth & Bowlby, 1991), Young (1999a) elaborated upon the concept of cognitive schemas, hypothesising that maladaptive schemas develop during childhood or adolescence primarily as a result of 'toxic' childhood experiences (i.e. unmet emotional needs). Young (1999) conceptualised early maladaptive schemas (EMS), as self-defeating emotional and cognitive patterns regarding oneself and one's relationships with others which: (i) begin during childhood or adolescence; (ii) are dysfunctional to a significant degree, and; (iii) are elaborated upon throughout one's lifetime (p. 9). Based upon clinical experience, Young (1999a) originally categorised 18 primary EMS into five broad domains of unmet emotional needs: 1. *Disconnection and*

Rejection, 2. *Impaired Autonomy and Performance*, 3. *Impaired Limits*, 4. *Other-Directedness* and 5. *Overvigilance and Inhibition*. According to Young's schema theory, EMS play a causal role in the development of psychopathology.

An earlier study conducted by Mairet, Boag, Wong, Warburton and Rapee (2014a) indicated that Australian individuals higher in social anxiety show higher scores for EMS, particularly those related to domain 1: *Disconnection and Rejection*. This domain comprises five EMS that originate from a child's early environment providing inadequate safety, security and emotional nurturance. The key schemas relate to: *abandonment/instability*, involving the persistent fear that significant others will leave; *mistrust/abuse*, involving the expectation that significant others will be abusive, manipulative or humiliating; *emotional deprivation*, involving the expectation that significant others will not meet one's needs for emotional support; *defectiveness/shame*, involving a persistent sense that one is defective, inferior or unlovable, and; *social isolation/alienation*, involving a strong sense of isolation from the rest of the world or of being different from others.

These findings are largely consistent with past research. For instance, Hinrichsen, Waller and Emanuelli (2004) examined the EMS associated with social anxiety and agoraphobia in individuals with eating disorders. Multiple regression analyses revealed that abandonment and emotional inhibition schemas explained 25.9% of the variance in data, suggesting that females with eating disorders with high comorbid social anxiety have both a fear of losing significant others and are emotionally inhibited in order to avoid disapproval. Given that this study was conducted in a sample of females with eating disorders, further studies examining the schematic structure of individuals with social anxiety were necessary.

In a study involving socially anxious individuals, Pinto-Gouveia, Castilho, Galhardo and Cunha (2006) found that individuals with social phobia scored significantly higher than non-phobic individuals on measures for most EMS. Moreover, socially anxious individuals scored higher than a mixed anxiety group (including individuals with panic disorder and obsessive-compulsive disorder) for schemas related to *emotional deprivation*, *mistrust/abuse*,

social isolation/alienation, *defectiveness/shame*, *failure*, *social undesirability/defectiveness*, *subjugation* and *dependence* which primarily relate to the *Disconnection and Rejection* domain. This finding suggests that individuals with social anxiety do not expect that their needs for stable, trustworthy, nurturing and empathic relationships will be met in a predictable manner compared to individuals with other forms of anxiety. A study conducted by Calvete and Orue (2008) using a non-clinical university sample also indicated that social anxiety is mainly related to schemas themed around *abandonment*, *failure* and *emotional inhibition*, suggesting that individuals high on social anxiety harbour a fear that significant others may leave them, that they will inevitably fail or are inadequate and need to hide their true feelings to avoid disapproval by others.

More recently, Calvete, Orue and Hankin (2013) conducted a large longitudinal study involving 1052 non-clinical adolescents to assess whether EMS predict anxious automatic thoughts and to see whether such thoughts act as mediators between schemas and prospective changes in social anxiety symptoms. Results suggested that schemas predict more surface-level anxious thoughts and these in turn perpetuate the schemas themselves. This bidirectional relationship was evident for schemas in the *Disconnection and Rejection* domain and for negative automatic thoughts regarding self-concept. Additionally, it was found that schemas from the *Other-directedness* domain play a key role in the development and maintenance of social anxiety.

Taken together, these studies support the supposition that adults higher on social anxiety experience higher levels of EMS, particularly those relating to the domain of *Disconnection and Rejection*.

Temperament, Social Anxiety and Schema Therapy

From a theoretical perspective, the examination of the relationship between temperament and EMS is significant because temperament is considered to be an important vulnerability factor in the formation of EMS (Young et al., 2003). According to proponents of schema therapy, an individual's emotional temperament interacts with 'toxic' childhood

experiences to influence the formation and maintenance of EMS (Young et al., 2003). While the terms "temperament" and "personality" are used interchangeably by Young et al. (2003), there is an emphasis on the influence of biological precursors with the proposition that each child appears to have a distinct temperament or personality from birth that provides the basic foundations for how s/he interacts with the world. Nevertheless, while temperament is an important factor that may influence what a child is exposed to and how the child responds to his or her environment, Young et al. (2003) further propose that an extremely favourable or aversive early environment can override a child's emotional temperament. For example, a loving family environment may encourage a shy child to be more sociable or a rejecting environment may leave a sociable child more inhibited. Moreover, a person's temperament may be protective against the formation of EMS (Young et al., 2003).

While the distinction between "temperament" and "personality" is often obscure (see Piekkola, 2011), when considering the emotional temperament variables that Young et al. (2003) relate to EMS development, the personality variables of introversion and neuroticism in adults appear to be the antecedents most closely related to the temperament constructs of inhibition to the unfamiliar (Kagan, Reznick, & Snidman, 1988) and negative affectivity, respectively found in children (Rothbart, Ahadi, & Evans, 2000). For the purposes of this paper, neuroticism is defined as the general tendency of an individual to experience unpleasant emotions, while introversion is defined as tendency and preference for fewer social interactions (McCrae et al., 2000). The basic traits of introversion (the inverse of extroversion) and neuroticism have been components in the majority of prominent trait models, including the Big Five and Big Three and are subsequently referred to as the Big Two (Clark & Watson, 1999). Additionally, these factors are highly robust traits that remain somewhat stable over time (Molfese & Molfese, 2000), have a substantial genetic component (Clark & Watson, 1999), and numerous studies have found that they correlate highly with social anxiety and SAD (Kashdan, 2002; Levinson, Langer, & Rodebaugh, 2011; Naragon-

Gainey & Watson, 2011; Norton, Cox, Hewitt, & McLeod, 1997; Schmidt & Riniolo, 1999; Watson, Gamez, & Simms, 2005).

While some findings have shown significant correlations between EMS and high neuroticism within child, adolescent and adult samples (Muris, 2006; Sava, 2009; Thimm, 2010a), and also high introversion in an adult sample (Thimm, 2010a), the relationship between temperament, coping styles and EMS are yet unknown.

Schema Coping Styles

According to Young et al. (2003), temperament is an important factor in determining the type of coping mechanisms an individual adopts when schemas trigger distressing thoughts, feelings and emotions. In fact, it has been suggested that "temperament probably plays a greater role in determining patients' coping styles than it does in determining their schemas" (Young et al., 2003, p. 35). Maladaptive coping styles develop at a young age in order to adapt to schemas that are often associated with intense or painful emotions. Unlike untreated schemas, however, an individual's coping style does not remain stable and he or she may use various coping styles to cope with the same schema in different situations or at different stages of his or her life. Furthermore, the assessment of coping styles/responses and EMS is clinically important given that Young and colleagues propose that "eliminating maladaptive coping responses permanently is almost impossible without changing the schemas that drive them" (Young et al., 2003, p. 37).

Similar to the anxiety literature which proposes three basic responses to threat (freeze, flight and fight) the three coping styles postulated by Young (1999a) and colleagues (Young et al., 2003) are *surrender*, *avoidance* and *overcompensation*, respectively. These coping styles are expressed through coping responses which are the *specific* behaviours or strategies employed by the individual (Young et al., 2003). While *schema surrender* occurs when an individual accepts that a schema is true, *schema avoidance* occurs when an individual tries not to activate schemas on either a conscious or unconscious level and *schema*

overcompensation is when an individual attempts to fight the schema by thinking, feeling and behaving as though the opposite of the schema were true (Young et al., 2003).

Schema Avoidance

Avoidance has been a component of prominent social anxiety models such as those proposed by Rapee and Heimberg (1997) as well as Clark and Wells (1995). Clinical evidence and research suggests that individuals with social anxiety regularly avoid social situations or use safety behaviours, such as drinking excessive amounts of alcohol, in order to cope with anxiety provoking situations (Morrison & Heimberg, 2013). In fact, recent research suggests that safety behaviours can be classified into subtypes; *avoidance safety behaviours*, such as low self-disclosure and avoiding eye contact and *impression-management safety behaviours* (Plasencia, Alden, & Taylor, 2011). Moreover, most cognitive-behavioural treatments for social anxiety specifically address individuals' avoidance strategies and apply exposure hierarchies to events or situations that are avoided.

Young (1999a) suggests that individuals use *cognitive* (avoiding thinking about something), *emotional* (blocking or numbing feelings), *behavioural* (utilising escape behaviours, such as drinking alcohol) and/or *somatic* (experiencing physical symptoms) means to avoid the thoughts, feelings and emotions associated with EMS. While these avoidance styles are potentially beneficial in the short-term because they can reduce the likelihood of a schema being activated, they often serve to maintain the schema because it has not been disconfirmed (Young, 1999a). In order to assess schema avoidance, Young and Rygh (1994) developed the *Young-Rygh Avoidance Inventory* (YRAI). However, while the YRAI is frequently used as a clinical tool to identify and assess individuals' use of avoidance strategies, the clinical utility and psychometric properties of this scale have been tested in only limited domains, such as samples with eating disorders (Luck, Waller, Meyer, Ussher, Wendon, & Waller, 2005; Sheffield et al., 2009; Spranger, Waller, & Bryant-Waugh, 2001) or substance abuse issues (e.g., Brotchie, Hanes, Wendon, & Waller, 2006).

Schema Overcompensation

While avoidance is associated with social anxiety, clinical observations also support the use of overcompensation strategies by socially anxious individuals. For example, a core component of SAD is a fear of negative evaluation (Hudson & Rapee, 2000). As such, individuals with SAD display a tendency to focus selectively upon evidence of failure and be excessively self-critical (Clark & Wells, 1995). In order to avoid the fear of failure, individuals with the disorder often set unrealistically high standards for themselves (Clark & Wells, 1995) and may use perfectionistic self-presentation to compensate for perceived inadequacies (e.g., Jain & Sudhir, 2010).

According to Young et al. (2003), schema overcompensation can be seen as an attempt by the individual to challenge EMS; but also as a response that is often excessive and ends up perpetuating the schema. For instance, an individual who felt as though they were worthless as a child may attempt to be perfect as an adult. To assess overcompensation strategies Young developed the *Young Compensation Inventory* (Young, 1998b). Endorsing the item "I am a highly critical person", for instance, may indicate overcompensation for a defectiveness/shame schema. While Young's (1999a) original model proposes that schema overcompensation is a single construct, recent research within eating disordered and non-clinical populations suggests the possibility of three sub-constructs: *individuality* (avoidance of emotional activation through independence and rebellion against society), *personal control* (avoidance of emotional activation through controlling the self) and *social control* (avoiding emotional activation through the control of others) (see Luck et al., 2005). Similarly to the YRAI, however, there is a paucity of studies assessing the psychometric properties of the YCI, particularly outside the realm of eating disorders (e.g., Luck et al., 2005; Sheffield et al., 2009) and substance abuse (e.g., Brotchie et al., 2006).

Purpose of the Present Study

Young et al. (2003) suggest that temperament interacts with both coping styles and EMS in the development of psychopathologies. However, to date, no research has tested this

claim. Subsequently, it is unclear whether temperament does, in fact, play a greater role in determining patients' coping styles than it does in determining their EMS, as Young et al. (2003) suggest, and whether or not there is a relationship between coping styles and EMS.

Given the above considerations, the aim of this study was to test the pathways proposed in Young's schema therapy model in order to provide a greater understanding of how risk factors for psychopathologies (e.g., temperament, coping style and EMS) relate to each other and to social anxiety. In particular, this study aimed to examine whether temperament affects the type of coping styles people use and whether it affects individuals' coping styles more than EMS likely linked to social anxiety, such as those from the *Disconnection and Rejection* domain. These findings may then assist in identifying possible areas for intervention and the individuals who are most likely to benefit from such interventions.

Guided by schema theory, it was hypothesised that (i) individuals high on social anxiety will display more schemas associated with *Disconnection and Rejection* than individuals low on social anxiety; (ii) introversion and neuroticism will have a stronger relationship with avoidance than overcompensation coping strategies; and (iii) introversion and neuroticism will have a stronger relationship with coping responses than schemas associated with *Disconnection and Rejection*. This was tested via structural equation modelling. Based upon Young's schema theory (1999a; 2003), three models (see Figures 2, 3 and 4) assessing the relationship between temperament (specifically introversion and neuroticism), coping strategies, *Disconnection and Rejection* schemas and social anxiety were created to test these relationships. Finally, the relationship between coping response and *Disconnection and Rejection* schemas was also examined.

Method

Participants

A non-clinical sample was chosen given that research indicates that social anxiety exists along a continuum (e.g., Tillfors, Furmark, Eskelius, & Freddrikson, 2004) and numerous other studies assessing temperament factors associated with social anxiety have been

conducted with non-clinical samples (e.g., Kashdan, 2002; Norton, Cox, Hewitt & McLeod, 1997). Participants included 360 undergraduate and postgraduate psychology students recruited from an Australian university. Participants received course credit for their participation or had a chance to win a gift voucher. Of this sample, 255 were female and 105 were male. Approximately 76% of the sample were between 17 and 20 years old with the other 24% being fairly evenly distributed from 21 through 25+ years of age, with a sample mean age of 20.68 (*SD* = 5.7). To compliment previous papers by the authors (Mairet et al., 2014 a, b) examining cross-cultural variations in EMS and social anxiety, in order to reduce cultural variability the inclusion criteria applied by Hong and Woody (2007) to Korean and Euro-Canadian samples were utilised. As a result, participants who considered themselves as either of Australian descent or at least third generation Australian and who both speak and read English as a first language were invited to participate while participants who had spent more than 7 years in total in a non-Western country were excluded. Based on these criteria, all of the participants reported that they identified themselves as being of Australian decent, with 90% being born in Australia and 10% being born in another country.

Measures

Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS). The SIAS and SPS (Mattick & Clarke, 1998) are two companion self-report measures used to assess social anxiety fears. While the SIAS examines fears of more general social interaction, such as speaking with individuals in authority or mixing in a group and making friends, the SPS examines fears of being scrutinised doing routine activities, such as writing, drinking and eating. Each scale contains 20 items rated on a 5 point Likert scale ranging from 0 (*not at all characteristic or true of me*) to 4 (*extremely characteristic of true of me*). Within a community sample, Mattick and Clarke (1998) reported that the SIAS and SPS each have coefficient alphas of .90. The SIAS and SPS displayed excellent reliability in the present study, with coefficient alphas of .93 and .94, respectively.

Young Schema Questionnaire – Short Form (YSQ - S3). The YSQ-S3 (Young, 2005)[16] is a 90 item self-report inventory consisting of items related to 18 separate schemas. These schemas are thought to cluster into 5 domains 1. *Disconnection and Rejection*, 2. *Impaired Autonomy and Performance*, 3. *Impaired Limits*, 4. *Other-Directedness* and 5. *Overvigilance and Inhibition*. For the purposes of this study, the authors focused on the five schemas thought to cluster into the *Disconnection and Rejection* domain. These included schemas related to *abandonment*, *mistrust/abuse*, *emotional deprivation*, *defectiveness/shame* and *social isolation*. There are five items per schema subscale. Responses range from 1 (*completely untrue of me*) to 6 (*describes me perfectly*) with higher scores reflecting a participant's greater endorsement of beliefs linked to a particular EMS (e.g., "I don't fit in"). Although several items have minor changes in wording, the content and number of items from this domain have remained the same between the YSQ-S3 and its predecessor the YSQ-S2 which has been assessed more robustly for its psychometric properties. The YSQ-S2 which includes 15 of the 18 YSQ-S3 schema subscales exhibits good to excellent reliability, with coefficient alphas ranging between .76 and .93 (Welburn et al., 2002). The YSQ-S3 displayed good reliability in the present study, with coefficient alphas ranging from .86 (*emotional deprivation*) to .89 (*defectiveness/shame*) at the subscale level and a coefficient alpha of .94 at the domain level.

Young-Rygh Avoidance Inventory (YRAI).[17] The YRAI (Young & Rygh, 1994) contains 40 items that assess schema avoidance. In a study of bulimic and non-clinical women, Spranger, Waller and Bryant-Waugh (2001) coded items according to the type of avoidance used and found the YRAI to be best represented by two scales (*cognitive/emotional* [*CE*] avoidance made up of 18 items and *behavioural/somatic* [*BS*] avoidance made up of 13 items), each with good levels of concurrent validity and acceptable levels of internal consistency. Each item is rated on a 6 point Likert scale from 1 (*completely untrue of me*) to 6

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(*describes me perfectly*) with higher scores indicative of greater avoidance. Previous research has found that the internal consistency for these scales is acceptable within eating disordered samples (total scale alpha = .79, *BS* = .65 and *CE* =.78; Spranger et al., 2001) and moderate within non-clinical samples (0.52 – 0.67; Sheffield et al., 2009). The YRAI displayed adequate reliability in the present study, with a coefficient alpha of .76 for the *CE* subscale and .74 for the *BS* subscale.

Young Compensation Inventory (YCI).[18] The YCI (Young, 1998b) contains 48 items assessing various methods used for schema compensation. Each item is rated on a 6 point Likert scale from 1 (*completely untrue of me*) to 6 (*describes me perfectly*) with higher scores suggesting greater use of compensation strategies. Three subscales have arisen in previous studies (*individuality* with 10 items, *social control* with 19 items and *personal control* with 4 items). Each factor has good psychometric properties within eating disordered and non-eating disordered individuals (see Luck et al., 2005). Previous research has found acceptable levels of internal consistency on each of the scales with coefficient alphas ranging above .70 in a non-clinical sample (Sheffield et al., 2009). The YCI displayed adequate to good reliability in the present study, with a coefficient alpha of .62 for *personal control*, .78 for *individuality* and .90 for *social control*.

Temperament. Ten items from the *Extroversion* subscale of the Big Five Domain were utilised (Goldberg et al., 2006). The five items reflecting extroversion (e.g., "I am the life of the party") were reverse scored to match the five items reflecting introversion (e.g., "I do not like to draw attention to myself"). Each item is rated on a 5 point Likert scale from 1 (*very inaccurate*) to 5 (*very accurate*). The coefficient alpha for this scale has been calculated at .87 (Goldberg et al., 2006). The introversion scale displayed good reliability in the present study, with a coefficient alpha of .89.

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Ten items from the *Neuroticism* subscale of the Neuroticism, Extroversion, Openness to Experience Personality Inventory were utilised (Goldberg et al., 2006). The five items reflecting low neuroticism (e.g., *I am not easily bothered by things*) were reverse scored to match the five items reflecting high neuroticism (e.g., *I have frequent mood swings*). Each item is rated on a 5 point Likert scale from 1 (*very inaccurate*) to 5 (*very accurate*) with higher scores reflecting greater neuroticism. The coefficient alpha for this scale has been calculated at .86 (Goldberg et al., 2006). The neuroticism scale displayed good reliability in the study, with a coefficient alpha of .85.

Procedure

The institution's Human Ethics Committee Ethics of Macquarie University granted approval for the current research to take place (see Appendix C). Participants completed a demographics questionnaire and then completed the SIAS, SPS, *Disconnection and Rejection* domain of the YSQ-S3, YCI, YRAI and two temperament scales individually online. Participants were then presented with an Information Form and thanked for their participation.

Results

Preliminary Data Analysis

Descriptive statistics for the study variables are presented in Table 1. All means were within the expected range for a nonclinical sample. Skewness statistics for the SIAS, SPS and YSQ-S3 *Disconnection and Rejection* schemas exceeded the recommended cut off of two times the standard error (Tabachnick & Fidell, 2001). These variables were transformed using a square root transformation prior to subsequent analyses.

Table 1
Descriptive statistics for all variables (N=360).

Variables	Minimum	Maximum	Mean	*SD*
YRAI Behavioural/Somatic	1.00	5.00	2.46	.70
YRAI Cognitive/Emotional	1.06	5.44	3.05	.62
YRAI Total	1.48	4.58	2.80	.54
YCI Social Control	1.26	5.63	2.80	.79
YCI Individuality	1.30	5.60	3.00	.80
YCI Personal Control	1.00	6.00	3.90	.98
YCI Total	1.67	5.27	3.00	.65
Introversion	1.00	5.00	2.57	.81
Neuroticism	1.00	5.00	2.69	.76
YSQ-S3: domain 1	1.00	5.60	2.14	.84
SIAS Total	2.00	79.00	23.23	14.32
SPS Total	0.00	64.00	15.23	13.70

Note. YCI Total: Young Compensation Inventory total score, *YRAI Total:* Young-Rygh Avoidance Inventory total score, *YSQ-S3: domain 1:* Disconnection and Rejection domain of YSQ-S3.

Model fit of the measurement models

Path analysis was used to compare models of predicted relationships between variables and to assess the comparative strength of these relationships. Coffman and MacCallum (2005) have suggested that the use of latent variable models can overcome the biasing effects of measurement error in path analysis models so latent variables were used to represent introversion, neuroticism, overcompensation, avoidance, *Disconnection and Rejection* schemas and social anxiety. Before exploring the paths within the model as a whole, the fit of the measurement model for each of the latent variables was analysed in order to achieve the most parsimonious structural models to compare. The models were tested via structural equation modelling (SEM) using Analysis of Moment Structures (AMOS v21.0). Paths between the observed variables and their error terms were constrained to one for all models.

Given that the chi-square statistic is sensitive to both skewness and sample sizes (Kenny, 2008) and that the three models being tested were not nested, other means of assessing model fit were used. Therefore, in addition to Root Mean Square Error of

Approximation (RMSEA), Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI), the Bayes Information Criterion (BIC) and Akaike Information Crietrion (AIC) were compared (Keith, 2006). RMSEA values of less than .05 suggest a good fit and values up to .08 represent acceptable errors of approximation (Byrne, 2001; Marsh, Hau, & Wen, 2004) while CFI and TLI values at or greater than .95 are considered a good fit and .90 are considered acceptable (Kenny, 2008; Tabnick & Fidell, 2001). AIC and BIC fit statistics are often used to compare non nested latent variable models with smaller values suggesting better fit (Keith, 2006).

Temperament. Item parcels are often considered better indicators of latent variables than using total scores (see Coffman & MacCallum, 2005) as they often result in improved fit and less biased solutions when using coarsely categorised and/or non-normally distributed items (see Bandalos, 2002). Therefore, two random item parcels per variable were used as indicators of introversion and neuroticism. Temperament latent variables were allowed to covary. The fit indexes were excellent for this model of temperament [$\chi^2(1, N=360) = .062$, $p = .803$, RMSEA=.00 (90% CI: .00; .09), CFI=1.00 and TLI= 1.00].

Social Anxiety. Three item parcels each were used to represent SIAS and SPS variables. SIAS and SPS were then represented by a social anxiety latent variable. Fit indexes for this measurement model for social anxiety were excellent [$\chi^2(8, N=360)=13.426$, $p = .098$, RMSEA=.04 (90% CI: .00; .08), CFI=1.00 and TLI=1.00].

Domain 1: Disconnection and Rejection. The five subscales from domain 1 of the YSQ-SF3 were included. Results indicated that the theoretical construct proposed by Young and colleagues was a good fit [$\chi^2(4, N=360)=6.613$, $p = .158$, RMSEA=.04 (90% CI: .08; .16), CFI=1.00 and TLI=1.00]. The squared multiple correlations were .47 for emotional deprivation, .53 for abandonment, .55 for mistrust/abuse, .55 for social isolation and .79 for defectiveness/unlovability. This suggests that the *Disconnection and Rejection* domain accounted for between 47% and 79% of the variability in these five observed variables, indicating this construct is a strong representation of the data.

Coping response. The measurement model for avoidance and overcompensation were originally tested using the two YRAI and three YCI subscales with underlying latent variables allowed to covary. This model for coping styles resulted in a fairly poor fit [χ^2(4, *N*=360)=34.898, *p* <.001, RMSEA=.15 (90% CI: .10; .19), CFI=.89 and TLI=.73].

Therefore a confirmatory factor analysis (CFA) at the item level was carried out separately on overcompensation and avoidance to see whether the subscales work well within this sample. Fit indices were poor for overcompensation [χ^2(492, *N*=360)= 2161.405, *p* <.001, RMSEA=.10 (90% CI: .09; .10), CFI=.63 and TLI=.61]. Standardised coefficients ranged from .25 to .72 for the 19 *social control* items, from .22 to .89 for the 10 *individuality* items and .35 to .87 for the 4 *personal control* items. Fit indices were also poor for avoidance [χ^2(433, *N*=360)=2095.228, *p* <.001, RMSEA=.10 (90% CI: .10; .11), CFI=.40 and TLI=.36]. Standardised coefficients ranged from .21 to .62 for the 18 *cognitive/emotional* items and .32 to .61 for the 13 *behavioural/somatic* items. These results suggest that the coping response subscales suggested by Luck et al. (2005) did not work well within this sample.

As a result, the three YCI and two YRAI subscales were not utilised in the analysis, however items making up these subscales were used to represent a total score for overcompensation and avoidance. Five random item parcels were created for overcompensation and four for avoidance. Error terms for the latent variables were allowed to covary. The revised measurement model for coping response was adequate [χ^2(26, *N*=360)= 82.142, *p* <.001, RMSEA=.08 (90% CI: .06; .10), CFI=.97 and TLI=.96] and was subsequently used in further analyses.

Overall Measurement Model. Correlations between the latent variables (Table 2) were ascertained from an overall measurement model (Figure 1) based upon the individual measurement models above. Model modification procedures were undertaken. As a result, introversion was allowed to covary with domain 1's *social isolation* subscale as these variables test somewhat theoretically similar constructs. Modification indices also suggested that neuroticism and SPS covary, possibly due to similar wording of some items. The fit of

the overall measurement model was adequate [χ^2(234,N=360)= 727.108, p <.001, RMSEA= .08 (90% CI: .07; .08), CFI=.92, TLI=.91, BIC=1115.591 and AIC=859.108].

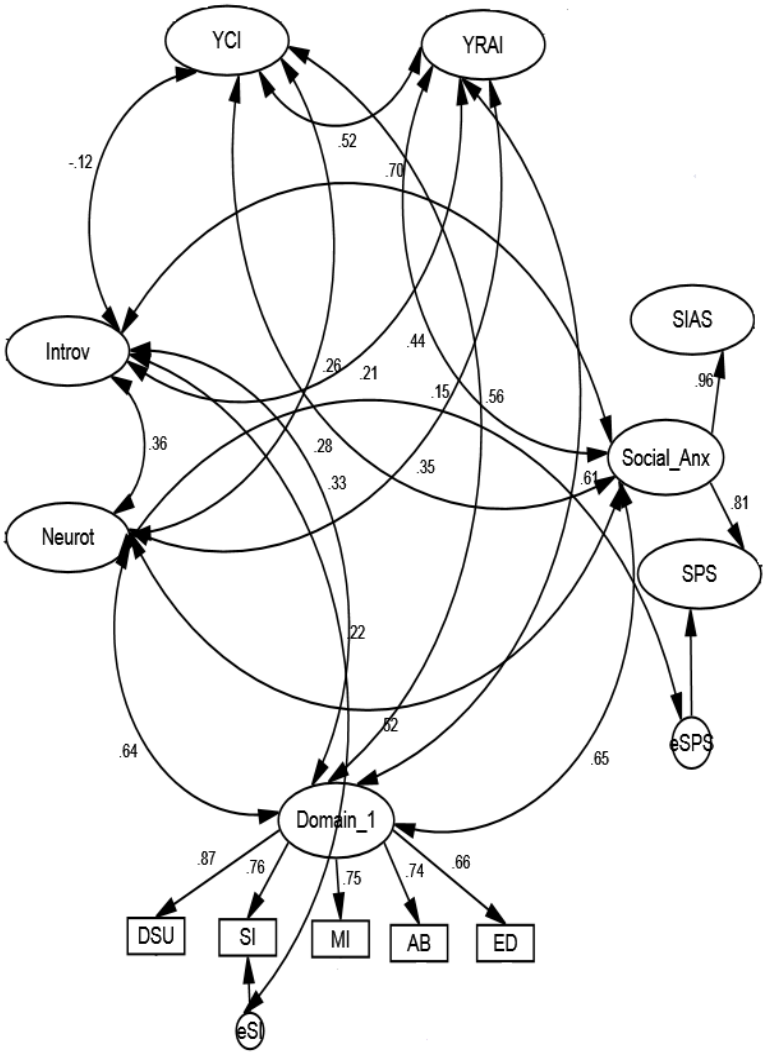

Figure 1. Covariance model presented without item parcels or error terms, except those involved in modification changes, for ease of understanding.

Note. Latent models are presented without item parcels or error terms, except those involved in modification changes, for ease of understanding. Standardised coefficients for the relevant paths have been included. *Intro* introversion, *Neurot* neuroticism, *YCI* Young Compensation Inventory, *YRAI* Young-Rygh Avoidance Inventory, *Social_Anx* social anxiety, *SIAS* social interaction anxiety scale, *SPS* social phobia scale, *eSPS* error term for SPS, *domain_1* Disconnection and Rejection domain of YSQ-S3, *DSU* defectiveness/unlovability, *SI* social isolation, *eSI* error term for social isolation, *MI* mistrust/abuse, *AB* abandonment and *ED* emotional deprivation.

Table 2

Correlations among latent variables.

	1.	2.	3.	4.	5.	6.
1. Introversion	-					
2. Neuroticism	.36**	-				
3. Overcompensation	-.12	.26**	-			
4. Avoidance	.21**	.35**	.52**	-		
5. Domain 1	.33**	.64**	.56**	.61**	-	
6. Social Anxiety	.70**	.52**	.28**	.45**	.65**	-

Note. $^{**}p < .01$.

While introversion correlated strongly with social anxiety, moderately with neuroticism as well as *Disconnection and Rejection* schemas and weakly (although significantly) with avoidance, it displayed a weak non-significant negative relationship with overcompensation. Neuroticism displayed a significant weak relationship with overcompensation and a moderate to strong relationships with avoidance, *Disconnection and Rejection* schemas and social anxiety. While social anxiety displayed a significant but weak relationship with overcompensation, it had significant and strong relationships with introversion, neuroticism, avoidance and *Disconnection and Rejection* schemas.

Links between social anxiety and Disconnection and Rejection Schemas. The standardised coefficient for the relationship between *Disconnection and Rejection* and social anxiety was both positive (.65) and significant ($p < .001$), indicating that individuals higher in social anxiety had stronger schemas associated with *Disconnection and Rejection* than individuals lower on social anxiety.

Links between temperament and coping strategies. Bivariate correlations suggest that introversion has a stronger relationship with avoidance than overcompensation. To test the significance of this difference, a test of differences between covariances was applied. Results indicated that more introverted individuals were significantly more likely to use avoidance as opposed to overcompensation coping strategies ($z = 4.94$, $p < .001$).

Bivariate correlations also suggest a tendency for neuroticism to be more strongly related to avoidance than overcompensation strategies, however, this difference was not significant (z = .56, p =.576).

Links between temperament and Disconnection and Rejection schemas. Bivariate correlations between introversion and the *Disconnection and Rejection* schema domain were in the predicted direction, although similar to the relationship between introversion and avoidance, the results indicated that this relationship was not significantly different (z = .84, p = .401). Introversion also had a stronger relationship with this schema domain than does overcompensation, as correlations were significantly different (z = 4.92, p <.001).

Neuroticism had a stronger relationship with *Disconnection and Rejection* schema than did avoidance, with the correlations again showing a significant difference (z = 1.96, p =.050). Similarly, neuroticism had a stronger relationship with this domain than did overcompensation (z = 4.74, p <.001).

Testing the Primary Theoretical Models

Model 1: No paths between coping responses and Disconnection and Rejection schemas. The first theoretical model yielded a poor fit [χ^2(238, N=360)= 853.125, p <.001, RMSEA=.09 (90% CI: .08; .09), CFI=.901, TLI=.91, BIC=1218.063 and AIC=977.125]. The resultant estimation model (Figure 2) yielded an adequate fit [χ^2(236, N=360)= 739.685, p <.001, RMSEA= .08(90% CI:.07; .08), CFI=.92 , TLI=.91, BIC=1116.395 and AIC=1116.395].

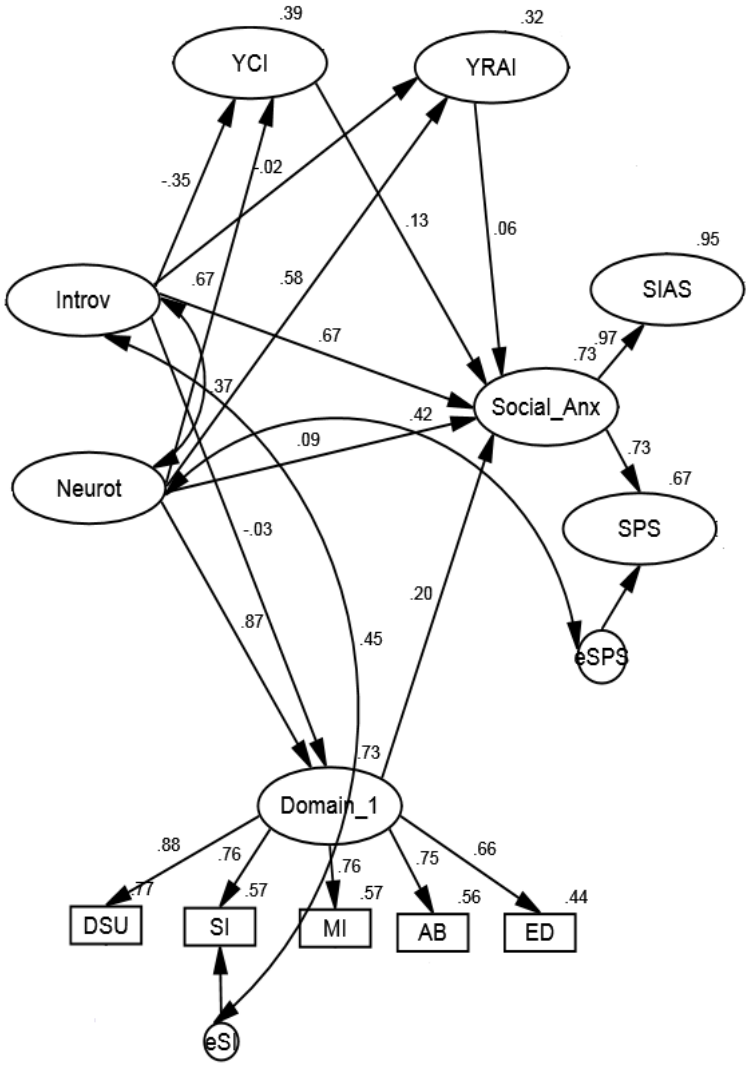

Figure 2. Model 1. No paths between coping responses and domain 1 schemas.

Intro introversion, *Neurot* neuroticism, *YCI* Young Compensation Inventory, *YRAI* Young-Rygh Avoidance Inventory, *Social_Anx* social anxiety, *SIAS* social interaction anxiety scale, *SPS* social phobia scale, *eSPS* error term for SPS, *Domain_1* Disconnection and Rejection domain of YSQ-S3, *DSU* defectiveness/unlovability, *SI* social isolation, *eSI* error term for social isolation, *MI* mistrust/abuse, *AB* abandonment and *ED* emotional deprivation.

Model 2: Paths from coping responses to Disconnection and Rejection schemas. A model in which overcompensation and avoidance coping responses predicted *Disconnection and Rejection* schemas was estimated (Figure 3). The fit indexes were adequate for this model fit [χ^2(234,N=360)= 656.702, p <.001, RMSEA= .07 (90% CI: .07; .08), CFI= .93, TLI=.92, BIC= 1045.185 and AIC= 788.702]. Overall, Model 2 was a better fit to the data than Model 1 suggesting that there is, in fact, a relationship between coping strategies and domain 1: *Disconnection and Rejection* schemas.

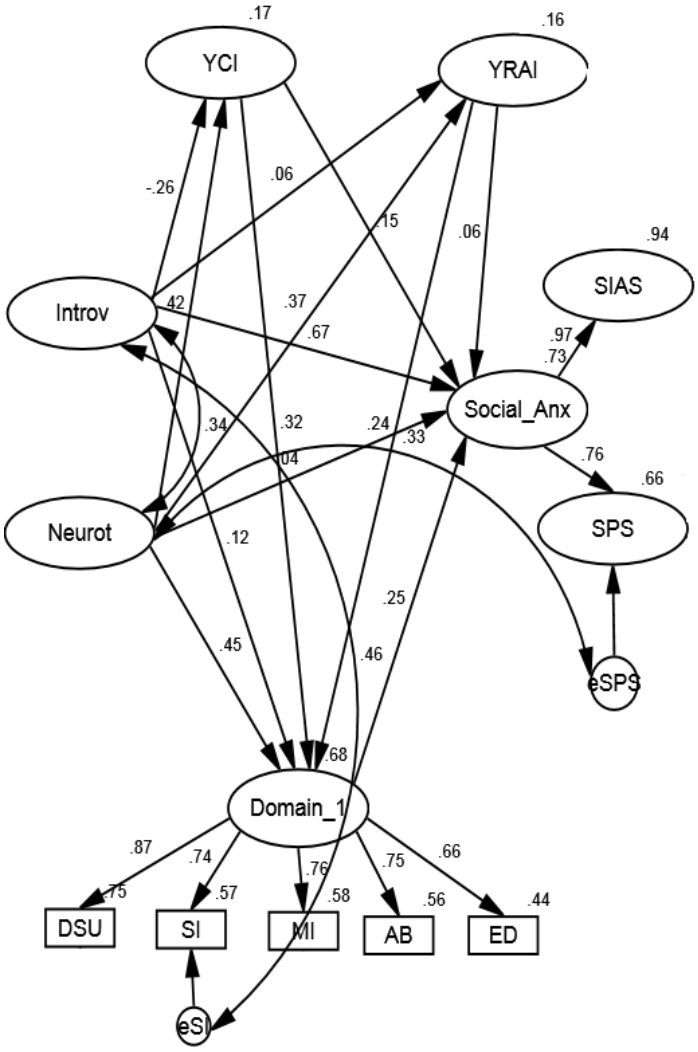

Figure 3. Model 2. Coping Response to domain 1 schemas.

Intro introversion, *Neurot* neuroticism, *YCI* Young Compensation Inventory, *YRAI* Young-Rygh Avoidance Inventory, *Social_Anx* social anxiety, *SIAS* social interaction anxiety scale, *SPS* social phobia scale, *eSPS* error term for SPS, *Domain_1* Disconnection and Rejection domain of YSQ-S3, *DSU* defectiveness/unlovability, *SI* social isolation, *eSI* error term for social isolation, *MI* mistrust/abuse, *AB* abandonment and *ED* emotional deprivation.

Model 3: Paths from Disconnection and Rejection schemas to coping responses.

Next, a reverse model in which domain 1 schemas predicted overcompensation and avoidance coping responses was estimated. The fit indexes were identical to model 2 [χ^2(234,N=360)= 656.702, p <.001, RMSEA= .07 (90% CI: .07; .08), CFI= .93, TLI=.92, BIC= 1045.185 and AIC= 788.702]. While the direction of causality cannot be established due to the cross sectional nature of this study, the magnitude and direction of the relationships can be inferred from the standardised beta coefficients. While the beta coefficient are .32 from overcompensation and .24 from avoidance to domain 1 in model 2 (see Figure 3) they are .71 from domain 1 to overcompensation and .65 to avoidance in model 3 (see Figure 4), suggesting the possibility of a stronger relationship from schemas to coping response.

A non-recursive model examining a bidirectional relationship between coping responses and schemas was tested. However it was under-identified, (i.e. there were more paths than information to estimate the paths) and was thus not solvable (Keith, 2006). Various strategies for overcoming this issue were unsuccessful.

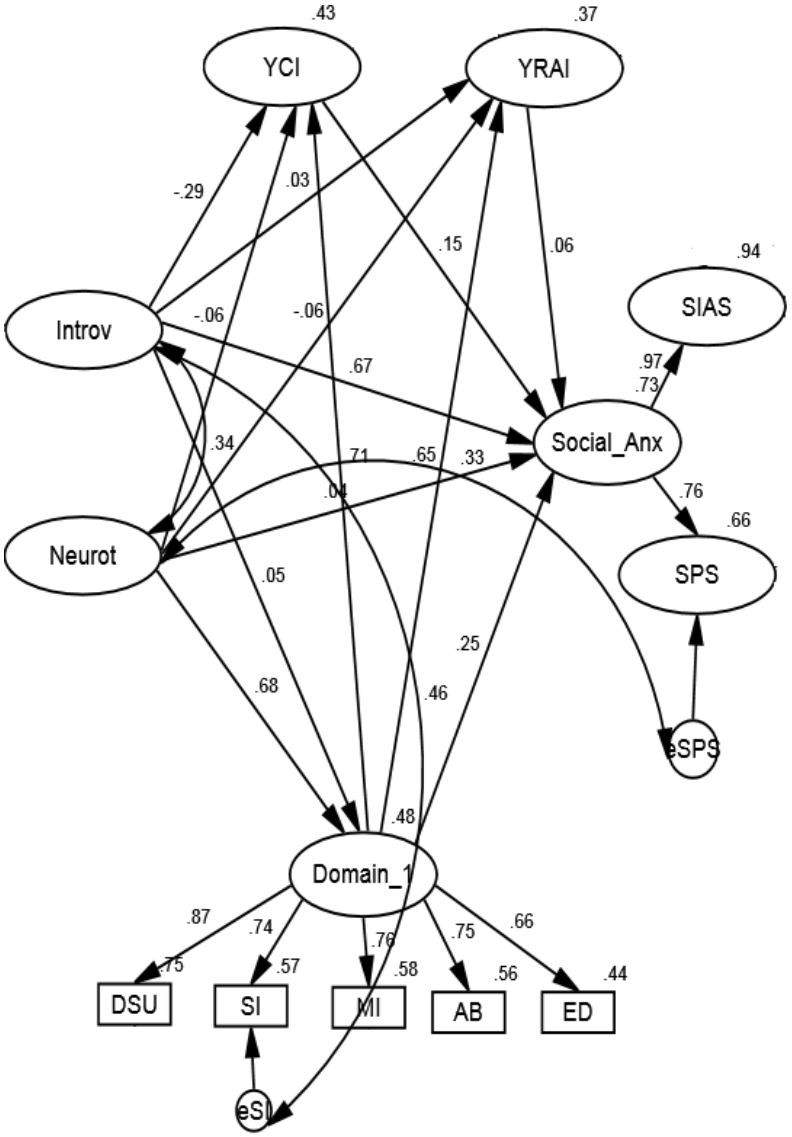

Figure 4. Model 3. Domain 1 schemas to coping response.

Intro introversion, *Neurot* neuroticism, *YCI* Young Compensation Inventory, *YRAI* Young-Rygh Avoidance Inventory, *Social_Anx* social anxiety, *SIAS* social interaction anxiety scale, *SPS* social phobia scale, *eSPS* error term for SPS, *Domain_1* Disconnection and Rejection domain of YSQ-S3, *DSU* defectiveness/unlovability, *SI* social isolation, *eSI* error term for social isolation, *MI* mistrust/abuse, *AB* abandonment and *ED* emotional deprivation.

Discussion

The current study tested the pathways proposed by Young's schema therapy model. More specifically, the study investigated: (i) whether individuals higher in social anxiety display relatively more schemas associated with *Disconnection and Rejection* than individuals lower in social anxiety; (ii) whether temperament affects the coping strategies (i.e. avoidance or overcompensation) individuals' adopt, and; (iii) whether temperament affects individuals' coping strategies more than schemas associated with *Disconnection and Rejection*. Pathways proposed by Young's schema model were also examined in order to provide a greater understanding of how potential risk factors for social anxiety, including temperament, coping strategies and EMS, relate to one another.

As predicted, and in line with previous research (e.g., Pinto-Gouveia et al., 2006), individuals higher in social anxiety showed higher levels of schemas associated with *Disconnection and Rejection* than individuals lower in social anxiety. These findings appear consistent with research suggesting that individuals with social anxiety often come from an unsupportive/unaffectionate environment (*emotional deprivation*; Gibb, Chelminski, & Zimmerman, 2007), feel socially defective (*defectiveness/shame*; Darcy, Davila, & Beck, 2005), fear that others will abandon them (*abandonment*; Darcy et al., 2005), expect that others will hurt or humiliate them (*mistrust/abuse*; Gibb et al., 2007), and/or feel isolated from the rest of the world or different from others (*social isolation*; Olfson et al., 2000).

In addressing the relationship between temperament and coping strategies, as predicted, individuals scoring higher on introversion were significantly more likely to use avoidance as opposed to overcompensation coping strategies. This finding is in line with the diagnosis of SAD (APA, 2000) as well as previous models of social anxiety (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997) which indicate that socially anxious individuals tend to avoid social or performance situations and/or use avoidant safety behaviours to cope. Given the interpersonal nature of *Disconnection and Rejection* schemas, it is not surprising that socially anxious individuals try to avoid such situations in order to avoid embarrassment or rejection.

In terms of clinical implications, this finding supports therapy that concentrates on individuals' avoidant coping strategies during treatment (e.g., utilising exposure hierarchies and addressing safety behaviours), particularly when they have a more introverted temperament. Contrary to predictions, however, there was no significant difference between the use of avoidant as opposed to overcompensation strategies by individuals scoring higher on neuroticism. Together, these results indicate that an individual's temperament does, in fact, influence the coping strategies people adopt and thus should be considered an important factor during both the assessment and treatment of individuals with social anxiety and SAD.

As noted earlier, limited research has addressed the third research question concerning whether an individual's temperament affects their coping strategies more than the development of EMS. Young and colleagues have suggested that "temperament probably plays a greater role in determining patients' coping styles than it does in determining their schemas" (Young et al., 2003, p. 35). While the results of this study indicate that the relationship between introversion and *Disconnection and Rejection* schemas may have been stronger than the relationship between introversion and avoidant coping strategies, there was not a significant difference in this sample. Contrary to predictions, there was a stronger relationship between overcompensation and EMS in more introverted individuals, with *Disconnection and Rejection* schemas being more influential. This indicates that, while it may not be helpful treating introverted individuals' overcompensation strategies, it could be helpful to address their avoidant coping strategies, as in traditional CBT, and/or relevant *Disconnection and Rejection* schemas via schema therapy or schema-focused CBT (SF-CBT).

Contrary to predictions, and to Young et al.'s (2003) conjecture, there was a significantly stronger relationship between neuroticism and the *Disconnection and Rejection* schema domain than to neuroticism and avoidant or overcompensation coping strategies. These findings support past literature (e.g., Muris, 2006; Sava, 2009; Thimm, 2010a) which similarly found an association between EMS and high neuroticism. In fact, unlike introversion, the relationship between neuroticism and *Disconnection and Rejection* EMS was

stronger than the relationship between neuroticism and social anxiety. These findings make sense given that, compared to introversion, neuroticism is associated with the general tendency to experience unpleasant emotions. Furthermore, there is significant overlap between the definition of neuroticism and features of EMS. This raises the possibility that treating the EMS of individuals who score higher on neuroticism via schema therapy or SF-CBT maybe more beneficial than concentrating therapeutic interventions on coping responses/styles as in traditional CBT.

In addition to the above findings, three models were created based on Young and colleagues' (2003) schema theory. Of particular interest was whether or not there is, in fact, a relationship between coping strategy and *Disconnection and Rejection* schemas. Path analysis indicated that models 2 and 3, in which there was a path either from coping strategy to EMS or EMS to coping strategy, were superior to model 1 in which there was no path. That is, this study provides preliminary evidence for Young et al.'s (2003) supposition that there is a relationship between coping strategy and EMS, however no causal influences can be derived given that models 2 and 3 were equivalent due to the identical estimation of covariance matrices and the cross-sectional nature of the study. While further research is needed on the relationship between coping responses/styles and EMS, the results indicate that there is perhaps a stronger relationship from schemas to coping response than vice versa, suggesting that individuals' EMS influence the coping strategies they adopt. This is clinically significant, as it suggests that successful schema treatment can also bolster coping skills, an important factor in managing psychopathologies, including SAD.

These findings also need to be considered in light of Lee and Hershberger's (1990) recommendation to retain multiple models if they are not falsified by data or by a theoretical rationale "until each of them is more specifically examined by more refined theories" (p. 332). That is, while Young et al. (2003) suggest that temperament plays an important role in determining individuals' coping styles and EMS, greater theoretical development is necessary regarding the relationship between these variables. Moreover, Lee and Hershberger (1990)

suggest that if a researcher generates equivalent models having considered *a priori* rules, then two conditions that can be used to determine an optimal model are: (i) time precedence, and; (ii) mediating mechanisms. Since this is the first study, to the authors' knowledge, to examine the relationship between these variables using path analysis, whether coping strategies develop as a result of EMS or vice versa remains to be answered. It is also possible that a bidirectional relationship between coping strategy and EMS exists, similar to the proposed relationship in Calvete et al.'s (2013) longitudinal study assessing the temporal relationships among EMS and automatic thoughts. Therefore, results indicating a bidirectional relationship between these variables could represent an important finding for schema therapy theory. Additionally, it is likely that other variables, such as 'toxic' parenting, exist and need to be examined. Future research would benefit from exploring such relationships longitudinally in order to address both the time precedence and mediating roles of these variables.

Limitations and implications for future research

While the present study should be considered one of the first steps towards testing the underpinnings of Young's schema therapy model, several limitations need to be considered. As already noted, the cross-sectional nature of the study means that it is unclear whether individuals' coping styles develop before or after EMS or whether coping styles and EMS develop as a result of social anxiety or vice versa. As a result, causal claims cannot be made and this leaves important questions to be considered by future longitudinal research. Caution is also required before generalising these findings to clinical populations given that the sample consisted exclusively of Australian non-clinical adults. Indeed, this may explain why the results failed to confirm the factor structure of the YRAI and YCI subscales, as it could be expected that coping strategies would be comparatively higher in clinical populations. Future research examining the conceptual underpinnings and psychometric properties of these scales is necessary given the widespread use of these instruments in clinical settings. It is also worth noting that Young et al.'s (2003) definition of emotional temperament may differ from the personality trait of neuroticism. While this distinction is debatable, the results of this study

may need to be interpreted with caution until greater development schema therapy theory has taken place. In addition, given that the vast majority of schema research has been undertaken in Western cultures, future research should not only attempt to replicate but also extend upon the current study by examining these variables within non-Western cultures before generalising the findings. Finally, EMS are, by definition, partly unconscious (Young et al., 2003). Although online questionnaires may have enabled socially anxious individuals to be more open about their experiences, coping styles (i.e. avoidance or overcompensation) may have influenced individuals' responses due to defence mechanisms. Therefore, future studies may benefit from using projective tests or physiological indicators in the assessment of EMS.

Conclusion

This study was the first to examine the pathways theorised by Young in relation to temperament, coping styles, EMS and social anxiety. The results of this study provided some support for Young (1999a) and colleagues' (2003) schema therapy model, with important limitations to consider. For instance, although temperament appears to be an important factor when considering the relationship between EMS, coping styles and social anxiety, the belief of Young et al. (2003) that temperament is more influential in determining patients' coping styles than their schemas appears problematic given that temperament, particularly neuroticism, appeared to have a stronger relationship with *Disconnection and Rejection* schemas than coping strategies. The findings also suggest that individuals who are more introverted and/or use avoidant coping strategies may improve more quickly undergoing traditional CBT programs where exposure to avoided cognitions, behaviours or situations is emphasised, while more neurotic individuals and/or those who have chronic social anxiety or more complex SAD may benefit from schema therapy or SF-CBT.

While future research needs to both replicate and extend upon the purported relationship between these variables within a clinical sample, there are nonetheless clinical implications including the importance of considering individuals' temperament, coping styles and EMS when assessing and treating social anxiety and SAD.

Chapter 5

The Relationship Between Subliminal Disconnection and Rejection Cues, Avoidance Strategies and Social Anxiety: A Cognitive Perspective on the Processing of Threatening Information

Author contribution:

Miss Kathleen Mairet was solely responsible for the design of the research, data analysis and write-up of this paper. Dr Simon Boag and Dr Wayne Warburton provided research supervision and feedback on the paper.

Abstract

Research suggests that subliminal presentations of threatening stimuli provide both insight into the processing of threatening information as well as a direct measure of the behavioural and/or physiological effects of schema relevant cues whilst circumventing defences (e.g., avoidance). In a sample of Australian university students (n = 89) the present study examined (i) whether adults higher in trait and state social anxiety symptomatology experience greater EMS associated with *Disconnection and Rejection*, (ii) whether individuals higher in trait and state social anxiety symptomatology are more likely to use avoidance strategies, and (iii) whether visual subliminal stimuli related to *Disconnection and Rejection* schemas will increase levels of social anxiety compared to counter-schematic stimuli which are hypothesised to have an ameliorative effect. Participants were randomly allocated to one of three groups based on the subliminal cue presented (i.e. schema consistent, counter-schematic or neutral). Each group was then divided into groups scoring low and high on the *Social Interaction Anxiety Scale* (SIAS). Results indicated that (i) there was a significant relationship between *Disconnection and Rejection* schemas and *trait* but not *state* social anxiety, (ii) there was a significant relationship between avoidance strategies and *trait* social anxiety, however there was also a relationship between avoidance and *state* social anxiety in the high-SIAS group following the speech task, and (iv) there were no significant differences between groups who received the *Disconnection and Rejection* ("mummy does not love me"), counter-schematic ("mummy does love me") or neutral ("mummy is walking") cue, however there was a trend in the predicted direction when examining the high-SIAS group. The implications of the results for both research and treatment concerning social anxiety and SAD are discussed.

Introduction

Individuals with social anxiety fear negative evaluation by others (Furmark, 2002). While social anxiety is a relatively common human experience, when this fear becomes severe or disabling it may reach diagnostic criteria for social anxiety disorder (SAD), also known as social phobia (American Psychiatric Association [APA], 2013). While traditional cognitive behavioural therapy is currently considered the most effective form of treatment for social anxiety and SAD (Rodebaugh, Holaway, & Heimberg, 2004), cases remain where clients experiencing chronic and/or pervasive problems do not show improvements or relapse following treatment (Eskildsen, Hougaard, & Roseberg, 2010; Issakidis & Andrews, 2004). As such, research is increasingly examining the role that long standing and self-defeating patterns or themes, known as maladaptive schemas, play in the aetiology of social anxiety and SAD. One framework is provided by Young (1999a) and colleagues (Young, Klosko, & Weishaar, 2003) who propose that maladaptive schemas are associated with psychiatric symptomatology. In particular, research relating to Young's schema theory suggests that adults displaying higher social anxiety and SAD have higher maladaptive schemas primarily related to *Disconnection and Rejection*. Although Young et al. (2003) purport that such schemas can operate pre-consciously (i.e. outside awareness), few studies have addressed this aspect of schema therapy theory. Nevertheless, research suggests that subliminal presentations of threatening stimuli can provide insight into how information is processed and afford a direct measure of the behavioural and/or physiological effects of schema-relevant cues whilst bypassing defences, such as avoidance. Therefore, the current study examined whether visual subliminal stimuli related to the core beliefs underlying maladaptive schemas related to *Disconnection and Rejection* will increase levels of social anxiety compared to counter-schematic stimuli which are hypothesised to have an ameliorative effect.

Early maladaptive schemas and social anxiety

Young (1990; 1999a) and colleagues (Young et al., 2003) elaborated upon the work of Beck (1967) and others (e.g., Ainsworth & Bowlby, 1991) regarding cognitive schemas by

defining early maladaptive schemas (EMS) as "a broad, pervasive theme or pattern comprised of memories, emotions, cognitions, and bodily sensations regarding oneself and one's relationship with others that develop during childhood or adolescence" (p. 7). Schema therapy proponents hypothesise that EMS primarily develop as a result of unmet childhood needs, in areas such as secure attachment, autonomy, realistic limits, freedom to express valid needs and emotions, and spontaneity and play (Young, 1999a). Young proposes 18 EMS. These EMS in turn cluster into five broad categories or schema domains, including: *Disconnection and Rejection*, *Impaired Autonomy and Performance*, *Impaired Limits*, *Other-Directedness* and *Overvigilance and Inhibition* (see Appendix A). According to Young et al. (2003), EMS represent the threat of one or more of the child's aforementioned core emotional needs not being met and/or a fear of the concomitant emotions or bodily reactions.

Despite schema therapy being used in clinical settings to treat individuals with social anxiety and SAD, limited studies have examined the schematic content associated with this population. Nevertheless, many of the studies carried out in adult samples have indicated that individuals who display symptoms consistent with social anxiety and SAD primarily have higher levels of schemas related to *Disconnection and Rejection* (e.g., Calvete & Orue, 2008; Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006).

Early maladaptive schemas, avoidance and preconscious processes

From a clinical perspective, the ability to identify EMS is important given that these schemas might be amenable to treatment. However, EMS are self-perpetuating and extremely resistant to change once they have been established as they can operate subtly and outside of conscious awareness (Young et al., 2003). Nevertheless, when a schema is triggered, an individual's thoughts and feelings become dominated by them and this usually results in a high level of affect, such as intense sadness, anger or anxiety (Young, 1999a). Consequently, individuals often develop maladaptive coping responses (i.e. state) and styles (i.e. trait) from a young age in order to reduce the overwhelming emotions associated with them (Young et al., 2003). Although individuals may use different coping styles at different stages of their life to

manage the same schema, Young (1999a) and colleagues (Young et al., 2003) propose three basic coping styles which generally operate outside awareness, including schema *surrender*, *overcompensation* and *avoidance*. These three coping styles correspond to the basic responses to threat (i.e. freeze, fight and flight, respectively).

Avoidance in particular has featured prominently in the major models of social anxiety (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997). Young's (1999a) construct of schema avoidance consists of *cognitive avoidance* (to avoid thinking about something), *behavioural avoidance* (such as escape behaviours), *emotional avoidance* (blocking emotional responses) and *somatic avoidance* (avoiding experiencing physical symptoms). Whilst avoidance has the short term benefit of reducing the likelihood of EMS being triggered, this form of coping style also reduces the chance of the EMS being challenged and consequently "healed" (Young, 1999a). Avoidance strategies pose a problem for research relying solely on self-report methods given that individuals may lack insight into their schemas and/or may not respond truthfully to questions. As a result, the individual may have difficulty identifying, discussing and subsequently challenging maladaptive EMS.

The biology of early maladaptive schemas

Based on research on emotion and the biology of the brain (LeDoux, 1996), Young et al. (2003) have tentatively proposed a biological view of schemas, however this aspect of their theory has received little attention in related studies. While Young et al. (2003) acknowledge that there are numerous emotional systems in the brain, they focus upon the brain network primarily associated with fear conditioning and trauma. Importantly, Young et al. (2003) propose that threatening stimuli is frequently processed by the amygdala system outside of awareness before the associated emotions, bodily sensations and cognitions are processed consciously. Beck and Clark (1997) provide a revised schema-based information processing model of anxiety which takes into account the unconscious processing of threatening information. Consequently, Beck and Clark's (1997) cognitive model may

provide a useful framework for examining the Young et al.'s (2003) hypothesised biological view of EMS.

A schema-based information processing model of anxiety

Considerable research has identified that individuals who are highly anxious tend to display a cognitive bias towards the selective processing of threat related information (e.g., Heinrichs & Hofmann, 2001; Morrison & Heimberg, 2013). Expanding on Beck, Emery, and Greenberg's (1985) original model, Beck and Clark (1997) propose a three-stage information processing sequence which accounts for the complex interplay between cognitive, affective, physiological and behavioural patterns when anxiety is evoked.

The first stage involves the rapid and automatic recognition of a stimulus (i.e. the *orienting mode*; Beck, 1996). Beck and Clark (1997) propose that processing at this stage encompasses the recognition of the valence (neutral, positive or negative) and/or personal relevance of the information as a means of identifying whether the stimulus is a threat or not. In the case of anxiety, there is believed to be biased selective attention to negative, personally relevant information, leading to the second stage (i.e. the *immediate preparation*), which activates the "threat" primal mode aimed at minimising danger and maximising safety (Beck, 1985). Beck and Clark (1997) identify a number of primal responses to threats, including (i) autonomic arousal (i.e. preparing the body for fight or flight), (ii) behavioural mobilisation and inhibition (i.e. escape and avoidance behaviour aimed at reducing danger), (iii) primal thinking (i.e. narrowing cognitive processes to the threat stimulus), (iv) a feeling of fear (i.e. essentially motivating the individual to act); and (v) hypervigilance for threat cues. Once triggered, the primal threat mode tends to dominate the information processing system, reducing the chances of secondary, and more constructive modes of thinking. Although processing may occur outside of awareness, the individual may be aware of the products of the analysis of the threat stimulus (i.e. the *primary threat appraisal*). Beck and Clark (1997) propose that the primary threat appraisal can result in (i) the narrowing of cognitive processing that leads to biases and/or inaccuracies about the probability and severity of the

feared situation, and/or (ii) negative automatic thoughts regarding the threat (e.g., "I will not be able to cope").

The final stage of Beck and Clark's (1997) cognitive model (i.e. *secondary elaboration*) is activated by the primal threat mode. The processing of information is comparatively slower, effortful and more schema driven whilst remaining involuntary due to the activation of the primal mode. Here, other schemas are activated regarding the present concerns or personal issues of the individual. The individual then begins to evaluate how effective they may be in coping with the perceived threat (Beck et al., 1985). At this stage, a *metacognitive* mode of thinking is activated. As previously mentioned, research indicates that avoidance plays a primary role in maintaining anxiety (see Morrison & Heimberg, 2013). Depending on whether an individual avoids reflecting upon their anxious thoughts, Beck and Clark (1997) propose three outcomes, (i) anxiety may reduce because the individual has used defensive behaviour, such as escaping the situation, (ii) the level of anxiety may decline as the individual realises more constructive ways to cope with the situation, (iii) an escalation in anxiety as the individual does not appraise the situation realistically or they fail to learn more adaptive ways of coping.

Beck and Clark's (1997) model of anxiety is relevant to the current paper as it provides a theoretical framework regarding the process by which threatening information might be processed both pre-consciously and consciously. This framework is in line with Young et al.'s (2003) proposed biological view of maladaptive schemas as it takes into account the importance of the often rapid and automatic nature of cognitive processes as well as the roles that autonomic arousal, schemas and coping responses/styles (e.g., avoidance) may play in the development and maintenance of anxiety.

Subliminal research

While the majority of studies examining maladaptive schemas have utilised conscious processing tasks, whereby a threat is both perceived and consciously processed, the results of subliminal processing tasks suggest that the effects of emotionally threatening information

can take place pre-consciously. In fact, Silverman (1983) claims that subliminal stimuli are, in part, effective because they bypass defences and can subsequently influence later behaviour. While various methods have been utilised to present stimuli subliminally, such as dichotic listening, subliminal visual processing tasks appear to be the most valid and reliable paradigm (see Trandel & McNally, 1987; see also Boag, 2008). During such tasks, visual stimuli are presented below an individual's awareness threshold. Although the individual cannot consciously perceive the cue, there appears to be evidence that the stimuli's content subsequently affects the individual's latter behaviour (Silverman, 1983)

Several neuro-imaging studies utilising subliminal presentations have demonstrated that the amygdala plays a crucial role in the unconscious processing of emotionally threatening information (e.g., Williams et al., 2006; Lipka, Miltner, & Straube, 2011). In considering subliminal research relating to social anxiety and SAD, the majority of studies have presented images of faces (neutral, positive or negative) and assessed the impact using both self-report (e.g., measures of state anxiety) as well as physiological measures (e.g., functional magnetic resonance imaging (fMRI) and/or skin conductance) (e.g., Cooney, Atlas, Joormann, Eugène, & Gotlib, 2006; Dannlowski et al., 2013; Killgore & Yurgelun-Todd, 2005; Tsunoda et al., 2007; Williams et al., 2006). The results of such studies indicate that individuals with greater social anxiety who receive subliminal presentations of threatening faces typically display significantly greater differences in skin conductance, fMRI and self-report responses compared to those who receive subliminal neutral or positive faces.

While the majority of subliminal studies examining cognitive processes related to social anxiety and SAD utilise images of faces, few have attempted to examine the effect of schema-related stimuli. Numerous studies have, however, utilised such stimuli in research assessing how visual subliminal cues influence eating behaviour in women (e.g., Hallings-Pott et al., 2005; Meyer & Waller, 1999; Meyer & Waller, 2000; Waller & Barter, 2005; Waller & Mijatovich, 1998). For instance, Patton (1992) found that women presented with an abandonment cue (i.e. "Mama is leaving me") ate significantly more crackers than women

presented with a neutral subliminal cue (i.e. “Mama is loaning it”). Following from this, Meyer and Waller (1999) used a non-clinical female sample of 100 participants (*n* = 20 per group) to examine whether subliminal threat cues influence subsequent behaviour (i.e. eating) due to general emotional activation (utilising both positive and negative cues), negative emotional activation and/or the activation of appetite-related schemata. The results revealed that females exposed to the abandonment cue (“lonely”) ate significantly more than individuals who had received the neutral (“gallery”), positive (“happy”), or appetitive cue (“hungry”), while those who received the negative emotion laden cue (“angry”) ate the second largest amount. Interestingly, the results of this study appear to support cognitive models that highlight the important role of threat processing in eating behaviours, as opposed to models only focusing on food-related information.

In 2005, Waller and Barter conducted a study examining whether the behavioural impact of abandonment cues (i.e. eating) could be countered by the subliminal presentation of counter-schematic information (i.e. a unification cues). During Stage 1 of the experiment, participants completed a measure of eating and related attitudes (the *Eating Disorder Inventory*: Garner, 1991). In order to avoid priming effects, Stage 2 was carried out one week later. The researchers presented 96 non-clinical women (*n* = 24 in each group) with a subliminal abandonment cue (“lonely”), either preceding or followed by a neutral cue (“gallery”) or a unification cue (“friendship”). Each cue was presented via a tachistoscope for 3 ms 10 times, with a 5 s gap between presentations. Participants were then left alone in a room for five minutes with a bowl of crackers which they were offered. The results of the study indicated that women who received the subliminal unification cue either before or after the subliminal abandonment cue ate significantly less, indicating that counter-schematic cues may have an ameliorative effect on maladaptive schemas and related behavioural responses.

The results of Meyer and Waller (1999) and Waller and Barter’s (2005) studies are significant for several reasons. First, they provide evidence that subliminal threat related cues are, to some degree, processed pre-consciously and can impact upon subsequent behaviours

(e.g., eating). Second, it appears that subliminal threat cues influence unhelpful behaviours due to negative emotional activation rather than general emotion activation. This appears to be consistent with Beck and Clark's (1997) proposition that individuals with anxiety pay selective attention to negative, personally relevant information. Third, counter-schematic cues may have an ameliorative effect on maladaptive schemas and related behavioural responses.

In addition to providing a greater understanding about the processing of threatening information, subliminal studies using schema-related and counter-schematic stimuli may (i) serve as a diagnostic tool, allowing for the differentiation of different diagnoses, (ii) assist identifying specific EMS which can then be targeted in treatment, (iii) assess changes during the course of therapy (e.g., assess the impact of schema-related cues before and after treatment programs), and (iv) identify counter-schematic information which can be bolstered during the course of therapy. The ability to identify counter-schematic cues may have important implications for the treatment of anxiety given that the hallmark of this disorder is the inability for clients to terminate fear-generating processes once they begin (McNally, 1995). Given that Beck and Clark (1997) assert "therapy must aim at reducing the influence of Stage 2 processing and reinforce the impact of 3 processing" (p. 55), counter-schematic cues may deactivate what Beck and Clark (1997) call the "primal threat mode" long enough to allow for more constructive and/or reflective modes of thinking, with concomitant clinical benefits.

Current study

The current study aims at increasing our understanding of whether or not threatening information related to EMS is processed unconsciously by drawing on Beck and Clark's (1997) revised schema-based information processing model of anxiety. Additionally, the study aims to examine the relationship between *Disconnection and Rejection* schemas, avoidance strategies and social anxiety. Guided by previous literature, three predictions were proposed. First, *Disconnection and Rejection* schemas will be a significant predictor of social anxiety. Second, avoidance will be a significant predictor of social anxiety. Finally, there will

be a significant interaction between cue type and time such that relative to the control cue, participants presented with the negative cue will show a significant increase in social anxiety whereas participants presented with the positive cue will show a significant decrease in social anxiety scores.

Method

Participants

Given that social anxiety and SAD are believed to exist on a continuum (e.g., Brook & Schmidt, 2008; Fehm, Bessdo, Jacobi, & Fielder, 2008) and the cognitive processes that differentiate low from high socially anxious individuals are analogous to those seen in the comparison of non-anxious controls to individuals with SAD (Stopa & Clark, 2001), a non-clinical sample was deemed suitable for this study.

Previous research indicates that cross-cultural differences in EMS exist (Mairet, Boag, Wong, Warburton, & Rapee, 2014a) and that participants who come from divergent cultural backgrounds and/or have English as their second language may respond differently to schema related visual subliminal cues (Mairet & Boag, 2010). Therefore, in line with previous studies conducted by the authors (Mairet et al., 2014 a, b), in order to reduce cultural variability, the inclusion criteria applied by Hong and Woody (2007) to Korean and Euro-Canadian samples were utilised. As a result, participants who considered themselves as either of Australian descent or at least third generation Australian and who both speak and read English as a first language were invited to participate. Participants who had spent more than seven years in total in a non-Western country were excluded. Based on these criteria, all of the participants reported that they identified themselves as being of Australian descent, with 96% being born in Australia and 4% being born in another country.

Participants included 90 undergraduate students from an Australian university who participated in return for course credit (17 male, 73 female) with a mean age of 21.20 years (SD = 6.87). Participants were randomly allocated to one of three conditions to avoid expectancy effects and cue contagion (n = 30 in each group). Each group was defined by the

subliminal *Disconnection and Rejection* cue type (negative, positive and neutral). A female outlier was removed from the positive group as their maximum skin conductance score fell more than two standard deviations above the mean for that group. To test for potential age and gender differences, a multinomial logistic regression was conducted with groups as the dependent variable. Multinomial logistic regression analyses with group as the dependent variable indicated that there were no significant differences in age, [χ^2 (4, N = 89) = .19, p = .911] or gender [χ^2 (4, N = 89) = 1.11, p = .574] across groups. Gender differences in average levels of EMS and social anxiety have been observed in previous research (e.g., Calvete, Orue & Hankin, 2014; Orue, Calvete, & Padilla, 2014), with females tending to score higher. Therefore, gender was controlled for in the present study.

In line with Meyer and Waller (1999), Patton (1992) and Waller and Mijatovich (1998) who used three subscales of the *Eating Disorder Inventory* (EDI) to divide their samples into low-EDI and high-EDI groups, the participants' total scores on the *Social Interaction Anxiety Scale* (SIAS) were used to divide the total sample (N = 89) into low-SIAS and high-SIAS groups with approximately equal numbers of participants allocated to each group based on the subliminal cue presented (i.e. neutral, negative and positive). The SIAS was chosen given that it most commonly assesses more general social interaction fears, as opposed to the *Social Phobia Scale* (SPS) which examines fears of scrutiny while doing routine activities (e.g., eating, drinking and writing). While the low-SIAS group comprised of 44 participants (neutral: n = 15, positive: n = 14 and negative: n = 15), the high-SIAS group comprised of 45 participants (n = 15 per group). Table 1 shows the gender, mean ages, and social interaction anxiety (total SIAS scores) of the three groups based on the cue presented. According to the results of univariate analyses of variance (ANOVAs), there were no significant differences among the groups on the aforementioned characteristics.

Table 1
Group characteristics showing comparisons on gender, age and social interaction anxiety (SIAS scores).

Groups	**Neutral**		**Negative**		**Positive**		**One-Way ANOVA**	
	Low	*High*	*Low*	*High*	*Low*	*High*	*F* (1,86)	*p* value
Gender (M, F)	3, 12	1, 14	3, 12	3, 12	3, 11	4, 11	1.08	*NS*
Age	20.67	22.27	22.47	20.20	22.36	19.07	.21	*NS*
(*SD*)	(6.33)	(9.38)	(9.76)	(4.49)	(6.61)	(2.09)		
SIAS	13.07	34.00	14.53	34.80	13.86	31.80	.02	*NS*
(*SD*)	(3.96)	(9.25)	(5.91)	(8.65)	(2.41)	(8.50)		

Note. Low: low-SIAS group (*n* = 44), *High*: high-SIAS group (*n* = 45). *SIAS:* Social Interaction Anxiety Scale. *NS* = not significant. *ANOVA* = Analysis of Variance.

Apparatus

Physiological Arousal. Galvanic Skin Response (GSR) was recorded as an index of physiological arousal. GSR (expressed in microSiemens: µS) was monitored using LabChart 7.0 software connected to a PowerLab Data Acquisition System (ML886 4/30; ADInstruments, 2004) while Data Pad was used for calculations on the waveform data. The analogue signal was digitised at 20K kHz and amplified using a gain of 40 mv/µS via 25 x 20mm electrodes which were attached to the index and ring fingers of the participant's non-dominant hand (see Dawson, Schell, & Filion, 2007). GSR levels were measured continuously during the experiment, however discrete time periods were ascertained and later examined. These periods of time included a baseline measurement, 30 seconds either side of the announcement of the social performance task and 10 seconds following the presentation of the cue.

Tachistoscope and visual subliminal cues. The PsyTec tachistoscope (Persona AB, Stockholm, Sweden) is widely and successfully used in subliminal research (Sohlberg & Birdgard, 2003) and was subsequently used in the current study. The apparatus is fitted with a contoured eyepiece that joins to an 80 x 55mm screen which projects visual stimuli

approximately 100mm from the participant's eyes. The tachistoscope ensures both direct attention to the subliminal cue as well as the elimination of environmental distractions and the standardisation of presentations. Similarly to a study conducted by Sohlberg, Birgegard, Czartoryski, Ovefelt, and Strömbom (2000), the room was dimly lit to ensure minimum light in the event that participants move their head resulting in exposure to the cue.

As in Waller and Barter's (2005) study, participants either received a schema consistent (negative) cue, a counter-schematic (positive) cue or a neutral cue. A previous study by the authors (Mairet et al., 2014b) revealed that perceived negative parenting practices are associated with social anxiety and that EMS partially mediate this relationship. Therefore, stimuli included the word "mummy" in order to emphasise the attachment process between the participant and a significant other. Given that the present study aims to examine the relationship between *Disconnection and Rejection* schemas and social anxiety, the negative cue was "mummy does not love me", the positive cue was "mummy does love me" and the neutral cue was "mummy is walking". While the cue "mummy does not love me" was designed to elicit feelings of abandonment, mistrust, emotional deprivation, defectiveness or shame and social isolation by a significant other, "mummy does love me" was used to induce feelings of unification, safety, nurturance, stability and acceptance. Finally, the stimulus "mummy is walking" was used as a neutral cue in the present study (Weinberger & Silverman, 1990). The words were printed in black lower case letters on projection slides.

Video Camera. The testing room came equipped with a video camera attached to the laboratory wall. Although the camera was not recording, its presence was made obvious to the participant to make the social performance task more convincing.

Measures

Social Interaction Anxiety Scale (SIAS) and Social Phobia Scale (SPS). The SIAS and SPS (Mattick & Clarke, 1998) are two companion self-report measures used to assess fears of social situations. While the SIAS examines fears of more general social interaction, such as speaking with individuals in authority and mixing with friends in a group (e.g., "I am

tense mixing in a group"), the SPS examines fears of being scrutinised doing routine activities, such as eating, drinking and writing (e.g., "I become anxious if I have to write in front of other people"). The SIAS and SPS each contain 20 items rated on a 5 point Likert scale ranging from 0. *not at all characteristic or true of me* to 4. *extremely characteristic of true of me.* Three items on the SIAS are framed positively and are therefore reverse scored before being summed. The SIAS and SPS both have excellent psychometric properties. Within a non-clinical sample, these scales were found to have coefficient alphas of .90 (Mattick & Clarke, 1998). In the current study, the SIAS and SPS displayed good to excellent reliability, with coefficient alphas of .89 and .93, respectively.

State Social Anxiety Scale. The *State Social Anxiety Scale* (Voncken, Dijk, de Jong, & Roelofs, 2010) was designed to measure feelings of insecurity, tenseness, nervousness, and anxiety. It consists of four items rated on a 7-point Likert scale (originally 9 point scale), ranging from low ratings of anxiety (e.g., "I do not feel anxious at all") to high ratings of anxiety (e.g., "I feel very anxious") with higher ratings indicating a higher level of social anxiety. The word "currently" was added to each item to indicate to the participants that ratings are based on present levels of social anxiety as opposed to trait social anxiety (e.g., "I currently do not feel anxious at all"). The scale has displayed good reliability in previous studies (alpha =.84; Voncken et al., 2010). In addition to these items, one item related more explicitly to social anxiety was included "I currently feel shy or anxious about being in social situations". The reformed *State Social Anxiety Scale* was administered during the experiment as a means of examining changes in self-reported levels of state anxiety. The reformed *State Social Anxiety Scale* displayed good reliability, with a coefficient alpha of .73.

Young Schema Questionnaire - Short Form (YSQ-S3). The YSQ-S3 (Young, 2005) is a 90 item inventory, with subscales designed to measure both the presence and severity of 18 EMS (see Appendix A). Each schema is representative of a broader schema domain. For instance, domain 1: *Disconnection and Rejection* comprises of 5 subscales, including *emotional deprivation*, *abandonment*, *mistrust*, *social isolation/alienation* and

defectiveness/unlovability. Each schema subscale consists of five items (e.g., *abandonment*: "I worry that people I feel close to will leave me or abandon me"). Items are rated on a 6-point Likert scale ranging from 1. *completely untrue of me* to 6. *completely true of me* with a high score taken to reflect a greater presence of that maladaptive schema. The YSQ-S3's predecessor, the YSQ-S2 which has been examined more rigorously, has shown moderate to high internal validity and reliability, with coefficient alphas ranging between .81 and .94 in an Australian sample (Baranoff, Oei, Cho, & Kwon, 2006). A previous study by the authors (Mairet, Boag, & Warburton, 2014) indicated that domain 1: *Disconnection and Rejection* of the YSQ-S3 displayed good reliability, with coefficient alphas ranging from .86 (*emotional deprivation*) to .89 (*defectiveness/unlovability*) at the subscale level and an excellent coefficient alpha of .94 at the domain level. In the present study, domain 1: *Disconnection and Rejection* displayed excellent reliability, with a coefficient alpha of .94.

Young-Rygh Avoidance Inventory (YRAI). The YRAI (Young & Rygh, 1994) is a 40 item inventory designed to assess levels of schema avoidance. Each item is rated on a 6 point Likert scale from 1. *completely untrue of me* to 6. *describes me perfectly* with higher scores indicative of greater avoidance. The results of a study assessing schema avoidance in bulimic and non-eating disordered women suggest that the YRAI is often represented by two scales, *behavioural/somatic* avoidance (consisting of 13 items) and *cognitive/emotional* avoidance (consisting of 18 items) (Spranger, Waller, & Bryant-Waugh, 2001). However, a previous study by the authors (Mairet, Boag, & Warburton, 2014) failed to confirm the factor structure of the proposed subscales of the YRAI in a non-clinical sample of both men and women when assessing social anxiety. As a result, a total score based upon the 40 items will be utilised as opposed to the separate subscales. The total YRAI score displayed acceptable reliability in the current study, with a coefficient alpha of .69.

Procedure

Participants signed up to complete Parts 1 and 2 of the study. A cover story was provided to disguise the purpose of the study until the debriefing at the completion of Part 2.

Participants enrolled in a study titled “The relationship between personality, subliminal exposure tasks and friendship”. Part 1 of the study involved participants completing several online questionnaires the night before attending Part 2 of the study in person in order to reduce possible priming effects.

Part 1 (Online Survey)

After providing informed consent, participants completed a demographics questionnaire regarding their age, gender, birthplace, parents’ birthplace and how many years they have been residing in Australia. Participants then completed the SIAS, SPS, domain 1: *Disconnection and Rejection* of the YSQ and the YRAI.

Part 2 (Experimental Testing)

Participants were randomly allocated to one of three conditions only (negative = 30, positive = 29, and neutral = 30) to avoid cue contagion and expectancy effects. Each group was defined by the subliminal cue presented (i.e. schema consistent, counter-schematic or neutral). When participants turned up to participate in Part 2 the following day, they were tested individually, with both participants and researchers being blind to the group to which the participants had been allocated.

Upon entering the room, participants were introduced to the tachistoscope in order to reduce the possibility of confounding levels of arousal observed later in the experiment. Participants were then attached to the skin conductance machine and asked to take five deep breaths through their nose in order to reduce arousal levels before a baseline measurement was taken. Participants completed a survey code (used to match Parts 1 and 2 of the study) and *Information and Consent Form*. Having completed the *State Social Anxiety Scale* items, participants were then told that the purpose of the study was to examine participants’ verbal language skills. In order to do this, participants were told that they would be primed with words, sentences or images via the tachistoscope before presenting a five minute impromptu speech on the friendships that they have developed whilst at university. Participants were then told that the speech would be recorded by the camera mounted on the wall and subsequently

rated by three academics who would then assess whether the subliminal cue appeared to influence what they spoke about or how they presented the speech. The inclusion of observer ratings was designed to increase the fear of being scrutinised. At this point, the *State Social Anxiety Scale* items were completed again and a second GSR rating was recorded in order to examine arousal levels. In order to augment the cover story, participants completed two questions concerning how fluent and relevant they believed their speech would be.

Unlike previous subliminal studies (e.g., Patton, 1992), participants then completed an informal eyesight test via the tachistoscope to control for any vision difficulties which could confound a participant's ability to read the cue. This entailed reading out three lines of five to six upper case letters per line. The font sizes varied by line with the uppermost written in the largest font. The middle line was the same size as the test stimuli. Data from two participants were removed and subsequently replaced due to eyesight problems. Participants were then told that a series of cues would be presented, that they would be very brief, and that they should continue trying to identify the stimuli because the ease with which it could be identified varies from person to person and may become easier over trials. Participants were also informed that at the completion of the presentations they would be asked to identify the cues. The aforementioned instructions are similar to those used by Patton (1992) to increase participant attention and motivation. A single cue was presented 10 times for 5ms each and separated by 5s. These parameters are similar to those used by Hallings-Pott et al. (2005), Meyer and Waller (1999) and Waller and Barter (2005). The final *State Social Anxiety Scale* and GSR ratings were taken for the final time at the completion of the subliminal presentations.

The GSR electrodes were then removed to reduce the possible confounding effects of increases in arousal due to performance anxiety. Weinberger and Hardaway (1990) advocate using free-recall as opposed to forced-choice questions, which is congruent with Meyer and Waller's (1999) methodology. Signal detection research indicates that second guesses are more accurate than chance (Patton, 1992). As a result, each participant was requested to

provide a first and second guess. Similar to previous research (e.g., Mairet & Boag, 2010; Waller & Barter, 2005), no participant correctly identified the cue. Participants were then thanked and requested not to inform other students about the aim or method of the study. A timeline outlining the study's methodology has also been provided in Appendix B.

Results

Preliminary Data Analysis

Statistical analyses were performed using *Statistical Packages for the Social Sciences* (SPSS v21). Given that skewness statistics for scores on the SPS and domain 1 scores of the YSQ exceeded the recommended cut off of two times the standard error (Tabachnick & Fidell, 2001) these scales were transformed using a Log10 transformation prior to subsequent analyses. Descriptive statics for the samples of interest are provided in Table 2.

Table 2
Descriptive statistics for variables of interest for both low- SIAS and high-SIAS groups.

	SIAS		***SPS*** [a]		***State Social Anxiety***		***Domain 1*** [a]		***YRAI***	
Neutral Group	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*
Minimum	8	19	1	2	5	6	5	6	85	98
Maximum	19	50	3	7	15	14	8	10	151	163
Mean	13.07	34	2.23	4.56	8.13	9.93	6.14	7.68	121.13	127.53
SD	3.96	9.25	.94	1.27	2.36	2.82	0.67	1.45	16.77	17.04
Positive Group										
Minimum	11	22	1	4	6	7	5	6	101	112
Maximum	18	46	5	17	11	13	10	11	157	156
Mean	13.86	31.80	3.02	5.04	8.79	9.80	7.01	7.71	121.36	132.47
SD	2.41	8.50	1.15	1.01	1.42	1.70	1.18	1.54	13.78	15.12
Negative Group										
Minimum	4	23	1	3	5	8	5	5	99	119
Maximum	21	51	4	8	11	13	9	10	137	157
Mean	14.53	34.80	2.72	4.60	8.40	10.87	6.59	7.87	114.47	133.33
SD	5.91	8.65	1.02	1.28	1.60	1.46	1.26	1.39	12.19	12.29

Note. Low: low-SIAS group (*N* = 44), *High*: high-SIAS group (*N* = 45). *SIAS:* Social Interaction Anxiety Scale; *SPS*: Social Phobia Scale; *State Social Anxiety*: State Social Anxiety Scale scores; *Domain 1:* Disconnection and Rejection from the YSQ; and *YRAI*: Young-Rygh Avoidance Inventory scores.
[a] Variables that have been Log10 transformed.

Gender was controlled for in each of the subsequent analyses. Partial correlations for the variables of interest are presented in Table 3[19]. While the SIAS only correlated significantly with the SPS and domain 1 in the low-SIAS group, it significantly correlated with each of the variables of interest in the high-SIAS group. In addition to the SIAS, the SPS had a moderate positive correlation with domain 1 schemas in the low and high SIAS groups, as well as with avoidance only in the high-SIAS group. In considering state anxiety, there were moderate positive correlations between the state anxiety scores at *baseline* and the SIAS, state anxiety following the announcement of the speech task as well as following the subliminal cues, however only in the high-SIAS group. Similarly, moderate positive correlations were identified between state social anxiety levels following the *speech task* and the SIAS, baseline state social anxiety, and avoidance for the high-SIAS group while it correlated with state social anxiety scores *following the subliminal cues* for both low and high SIAS groups. The state anxiety scores following the subliminal cue had a significant but weaker correlation with the SIAS in the high-SIAS group, with the relationship growing stronger following the announcement of the speech in both the low and high SIAS groups. domain 1 scores displayed a significant relationship with the SIAS and SPS in both low and high-SIAS groups as well as avoidance in the low-SIAS group. Finally, scores on the YRAI were moderately and positively correlated with the SIAS and SPS in the high-SIAS group, and domain 1 scores in the low-SIAS group. Interestingly, there was a significant relationship between avoidance scores on the state anxiety scale following the announcement of the speech task in the high-SIAS group, however this relationship was not significant in the low-SIAS group nor at baseline or following the subliminal cues in either of the groups.

[19] See Appendix C for Partial correlations between the variables of interest in high and low socially anxious groups by cue type.

Table 3
Partial correlations between the variables of interest for both low and high socially anxious groups.

	2		**3**		**4**		**5**		**6**		**7**	
Variables	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*
1. SIAS	.60**	.43**	.08	.44**	.13	.49**	.22	.27*	.49**	.43**	.16	.32*
2. SPS [a]	-	-	.28	.21	.14	.20	.21	-.02	.53**	.48**	-.00	.30*
3. State Social Anxiety (baseline)			-	-	.05	.46**	.07	.31*	.26	.26	-.22	.09
4. State Social Anxiety (speech task)					-	-	.56**	.36*	.06	.12	.17	.30*
5. State Social Anxiety (post cue)							-	-	.06	-.10	.17	-.08
6. Domain1[a]									-	-	.33*	.19
7. YRAI											-	-

Note. *$p < .05$, ** $p < .01$.

Low: low-SIAS group ($N = 44$), *High*: high-SIAS group ($N = 45$). *SIAS:* Social Interaction Anxiety Scale; *SPS*: Social Phobia Scale; *State Social Anxiety Scale* (baseline, speech task and post subliminal presentation scores)[20]; *Domain 1:* Disconnection and Rejection of the YSQ and *YRAI*: Young-Rygh Avoidance Inventory.
[a] Variables that have been Log10 transformed.

[20] *Note*. Neutral, negative and positive groups have been combined in Table 3 for ease of understanding (see Appendix C for partial correlations by cue presented).

Disconnection and Rejection schemas and Social Anxiety

SIAS and SPS Companion Measures. To examine whether individuals higher in social anxiety display higher EMS associated with *Disconnection and Rejection*, a multivariate analysis of variance (MANOVA), using the general linear model (GLM) procedure, was conducted. This procedure was utilised due to the strong positive relationship between the SIAS and SPS scales (see Table 3) as it allows for an efficient assessment of the relative contributions of the outcome variables (Huberty & Morris, 1989) while controlling the overall alpha level (Bray & Maxwell, 1982). In this analysis, domain 1: *Disconnection and Rejection* was entered as the independent variable while the two social anxiety measures (the SIAS and SPS) were entered as the dependent variables. The MANOVA yielded a significant main effect of *Disconnections and Rejection* schemas ($F(2, 40) = 9.69$, $p < .001$) for the low-SIAS group and ($F(2, 41) = 8.54$, $p < .001$) for the high-SIAS group. The univariate analysis revealed a significant main effect for the SIAS, for the low-SIAS ($F(1,41) = 12.80$, $p = .001$) and high-SIAS ($F(1,42) = 9.51$, $p = .004$) groups. The main effect for the SPS was also significant in both the low-SIAS ($F(1,41) = 13.40$, $p < .001$) and high-SIAS ($F(1,42) = 12.76$, $p = .001$) groups. These results indicate that participants in both the low and high SIAS groups who display higher *Disconnection and Rejection* schemas tend to experience higher levels of social interaction anxiety (as measured by the SIAS) as well as fears of being scrutinised during routine activities (as measured by the SPS).

State Social Anxiety Scale. To examine the relationship between *Disconnection and Rejection* schemas and scores on the *State Social Anxiety Scale*, a regression was carried out with the *State Social Anxiety Scale* scores entered as the dependent variable. Separate regressions revealed non-significant relationships between *Disconnection and Rejection* schemas and scores on the *State Social Anxiety Scale* at baseline for the low-SIAS ($F(1, 41) = 2.99$, $p = .092$, $R^2 = .07$, $\beta = .43$) and high-SIAS ($F(1,42) = 3.08$, $p = .087$, $R^2 = .07$, $\beta = .37$) groups. The relationship between *Disconnection and Rejection* schemas and scores on the *State Social Anxiety Scale* following the announcement of the speech task were also non-

significant for the low-SIAS ($F(1, 41) = .14$, $p = .713$, $R^2 = .00$, $\beta = 7.05$) and high-SIAS ($F(1,42) = .66$, p = .421, $R^2 = .02$, $\beta = .16$) groups. Finally, the relationship between *Disconnection and Rejection* schemas and scores on the *State Social Anxiety Scale* following the presentation of the subliminal cue for the low-SIAS $F(1, 41) = .14$, $p = .715$, $R^2 = .00$, $\beta = .14$) and high-SIAS ($F(1,42) = .45$, $p = .508$, $R^2 = .01$, $\beta = -.19$) groups were not significant.[21] Therefore, there appears to be a stronger relationship between *Disconnection and Rejection* schemas and *trait* social anxiety (as measured by the SIAS and SPS) as opposed to *state* social anxiety (as measured by the *State Social Anxiety Scale*).

Avoidance and Social Anxiety

SIAS and SPS companion measures. To examine whether individuals who display higher avoidance strategies experience higher trait social anxiety, a MANOVA was conducted using the GLM procedure. Scores on the YRAI were entered as the independent variable while the two social anxiety measures (the SIAS and SPS) were entered as the dependent variables. While the MANOVA yielded a non-significant main effect for avoidance in the low-SIAS group ($F(2,40) = .88$, $p = .423$), it yielded a significant main effect for the high-SIAS group ($F(2,41) = 3.27$, $p = .048$). Within the high group, the univariate analysis revealed significant main effects for both the SIAS ($F(1,42) = 4.93$, $p = .032$) and the SPS ($F(1, 42) = 4.21$, $p = .046$) suggesting that participants who display higher avoidance strategies from the high-SIAS group experience higher social interaction anxiety (SIAS) and fears of being scrutinised during routine activities (SPS) compared to participants in the low-SIAS group.

State Social Anxiety Scale. A regression was conducted to examine the relationship between levels of avoidance and scores on the *State Social Anxiety Scale*. Scores on the YRAI were entered as the independent variable while baseline state social anxiety scores were entered as the dependent variable. The regression revealed that the relationship between

[21] As mentioned, GSR data was attained as an additional measure of state anxiety/arousal; however these results will not be reported due to a lack of significant association with any of the other variables of interest. These results, however, can be made available by authors on request.

avoidance and self-reported state social anxiety at *baseline* was non-significant in the low-SIAS ($F(1, 41) = 2.12$, $p = .153$, $R^2 = .05$, $\beta = -.03$) as well as high-SIAS ($F(1, 42) = .35$, $p = .560$, $R^2 = .01$, $\beta = 6.92$) groups. While this relationship was non-significant following the announcement of the *speech task* for the low-SIAS group ($F(1,41) = 1.20$, $p = .280$, $R^2 = .03$, $\beta = .02$), the relationship was significant for the high-SIAS group ($F(1,42) = 4.07$, $p = .050$, $R^2 = .09$, $\beta = .04$). The relationship between avoidance and self-reported state social anxiety following the presentation of the subliminal cue was not-significant in the low-SIAS ($F(1, 41) = 1.26$, $p = .269$, $R^2 = .03$, $\beta = .03$) as well as high-SIAS ($F(1, 42) = .26$, $p = .613$, $R^2 = .01$, $\beta = -.01$) groups. Therefore, these results appear to suggest that individuals with higher social interaction anxiety are more likely to utilise avoidance strategies when a consciously perceived threatening situation, such as a speech task, is present compared to individuals low in social interaction anxiety. These preliminary findings also suggest that avoidance strategies may not be activated when threatening information is processed outside of awareness, or pre-consciously.

Social performance task manipulation

An analysis was carried out to examine whether scores on the *State Social Anxiety Scale* significantly increased from baseline following the introduction of the social performance task. A mixed design ANOVA was conducted with time (comparing baseline scores and scores following the announcement of the speech task) as the within subjects variable, group (negative, positive and negative) as the between subjects factor and *State Social Anxiety Scale* scores as the dependent variable. This analysis revealed that there was a significant increase in participants' state social anxiety scores in both the low-SIAS ($F(1,41) = 16.55$, $p <. 001$) and high-SIAS ($F(1, 42) = 27.70$, $p <.001$) groups. This suggests that the social performance task successfully increased participants' level of state social anxiety.

Effects of the visual negative, positive and neutral cues on levels of state social anxiety

State Social Anxiety Scale. A mixed design ANOVA was conducted with time (comparing anxiety levels following the announcement of the speech task to post subliminal

cue) as the within subjects variable, group (negative, positive and negative) as the between subjects factor and *State Social Anxiety Scale* scores as the dependent variable. In considering the low-SIAS group (see Figure 1), while the main effect of time ($F(1, 81) = 15.14$, $p < .001$) was significant, the main effects for gender ($F(1, 81) = 1.64$, $p = .203$) and group ($F(2, 88) = .62$, $p = .541$) were not. Moreover, the interaction between group and time was not significant ($F(2, 81) = .77$, $p = .468$). These results suggest that, although there was a significant increase in scores on the *State Social Anxiety Scale* over time, there were no significant differences between the three groups on state social anxiety scores over time.[22]

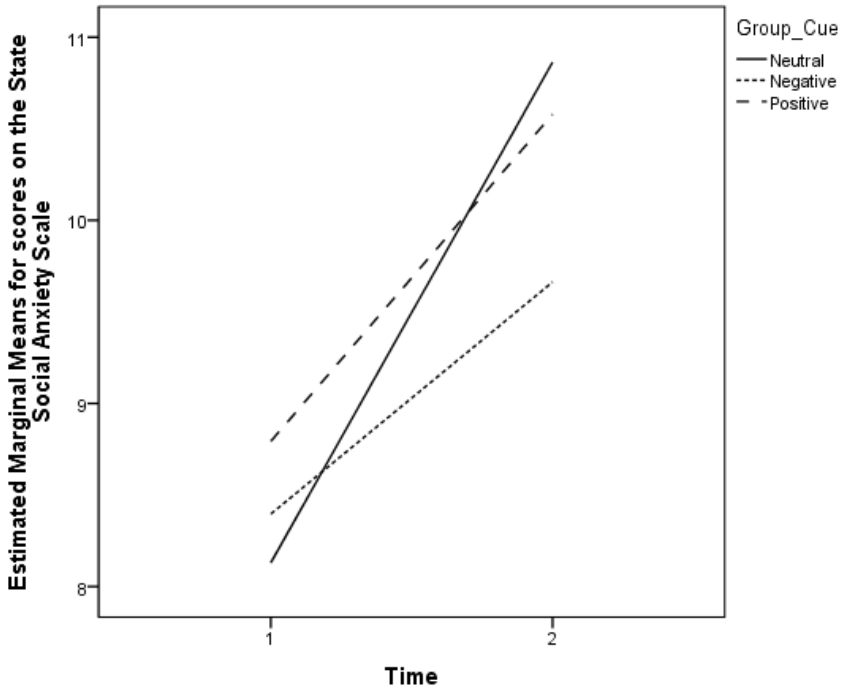

Figure 1. Interaction between time and group for state social anxiety scores in the low-SIAS group, controlling for gender.[23]

[22] ANCOVAs were also carried out using difference scores (between scores when the speech task was announced and following the presentation of the subliminal cues) on the *State Social Anxiety Scale*. The results were very similar to those obtained above. Therefore, to facilitate interpretation, only the results from the mixed design ANOVA are reported.

[23] Please note that there were no significant differences between the three groups on levels of state social anxiety at baseline ($F(2, 83) = 1.27$, $p = .286$).

In considering the high-SIAS group, the main effects of gender ($F(1,83) = 5.93$, $p = .017$) and time ($F(1,83) = 26.22$, $p < .001$) were significant, while the main effect for group ($F(2, 83) = 2.31$, $p = .105$) was not. Moreover, the interaction between group and time was not significant ($F(2,83) = 6.23$, $p = .539$). Although there were no significant differences between the groups (neutral, negative and positive) on state social anxiety over time, there appears to be a trend in the predicted direction with the negative group having the highest levels of state social anxiety following the subliminal cue, followed by the neutral group, and then positive group (see Figure 2).

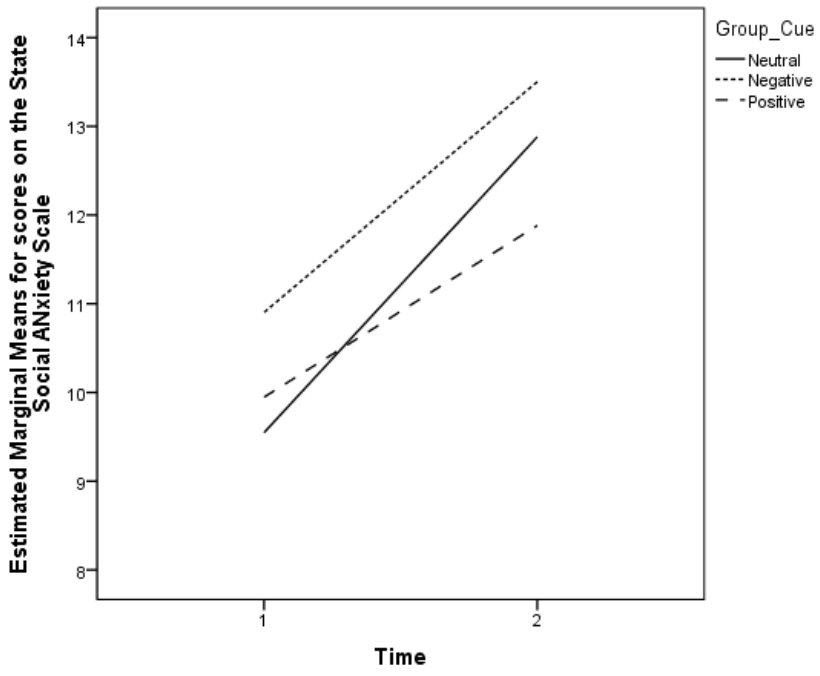

Figure 2. Interaction between time and group for state social anxiety scores in the high-SIAS group, controlling for gender.

In considering the total sample (both low and high-SIAS groups combined), it is worth noting that while the main effects of gender ($F(1,171) = 7.51$, $p = .007$) and time ($F(1,171) = 36.67$, $p < .001$) were significant, the main effect for group ($F(2,17) = .22$, $p = .800$) was not significant. Moreover, the interaction between group and time was not significant ($F(2,171) = 1.23$, $p = .296$). These results suggest that, although there was a significant increase in scores on the *State Social Anxiety Scale* over time, there were no significant differences between the three groups on state social anxiety scores over time. It is also worth noting that results for the total sample display similar trends to the low-SIAS as opposed to high-SIAS group (see Figures 1 and 3).

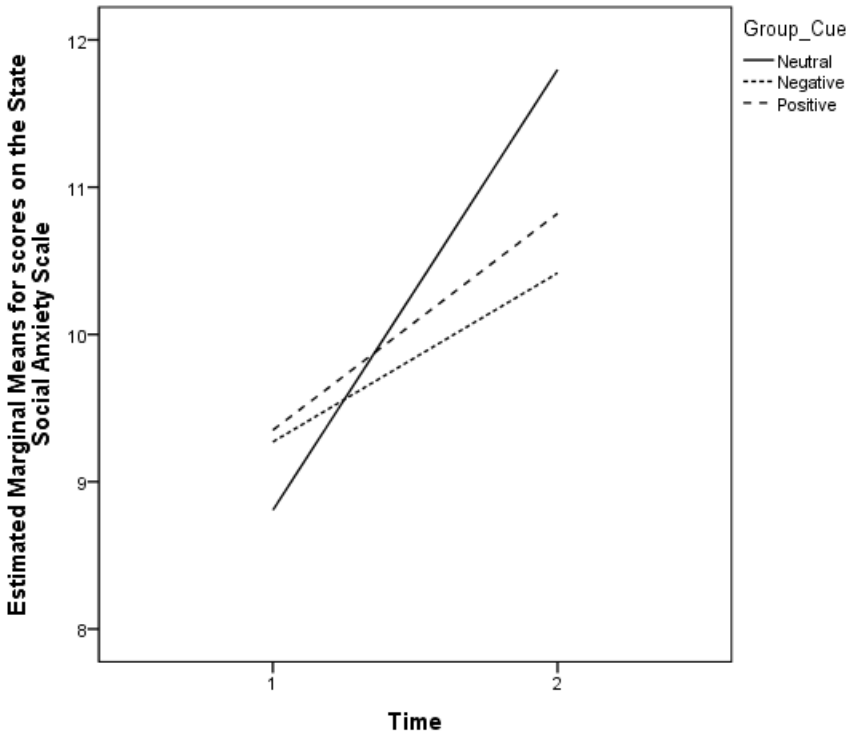

Figure 3. Interaction between time and group for state social anxiety in total sample, controlling for gender.

Discussion

The present study investigated the relationship between subliminal *Disconnection and Rejection* as well as counter-schematic stimuli, avoidance strategies and social anxiety in sample of 89 Australian non-clinical participants. Overall, the results revealed that (i) there was a significant relationship between *Disconnection and Rejection* schemas and *trait* social anxiety but not *state* social anxiety, (ii) there was a significant relationship between avoidance strategies and *trait* social anxiety, (iii) there was also a relationship between avoidance and *state* social anxiety in the high-SIAS group, however only following the speech task, and (iv) there were no significant differences between groups who received the *Disconnection and Rejection*, counter-schematic or neutral cue, however there was a trend in the predicted direction when examining the high-SIAS group.

Disconnection and Rejection Schemas and Social Anxiety

As predicted, higher *Disconnection and Rejection* schemas were associated with higher levels of *trait* social anxiety (as measured by SIAS and SPS scales) in both the low-SIAS and high-SIAS groups. These findings are largely consistent with previous research which has revealed that adults displaying higher social anxiety symptomatology show higher levels of schemas related to *Disconnection and Rejection* (e.g., Calvete & Orue, 2008; Mairet et al., 2014a; Pinto-Gouveia et al., 2006). This indicates that individuals with low and high levels of social anxiety appear to harbour a fear that significant others may not provide a stable, nurturing and trustworthy relationship. As Young (1999a) suggests, EMS are present in non-clinical populations however they become more extreme in symptomatic individuals. Given the interpersonal nature of the schemas associated with the *Disconnection and Rejection* domain, it makes sense that these individuals become anxious in social situations and/or try to avoid such situations in order to avoid negative affect or rejection.

Contrary to predictions, however, the relationship between *Disconnection and Rejection* schemas and *state* social anxiety was not significant at any of the three time points: at baseline, following the announcement of the speech task or following the presentation of the

subliminal cue. That is, the levels of *Disconnection and Rejection* schemas did not predict levels of social anxiety in the moment, even after the presentation of threatening stimuli. Taken together, these preliminary results make sense within schema therapy theory (Young et al., 2003) which conceptualises EMS as primarily a trait as opposed to state phenomena. It is possible that links are stronger with predispositions than with actual behaviour in the moment, although one would expect such schemas to have some predictive value for state anxiety.

Indeed, schema theory also posits that EMS can be activated by life events, leading to dysfunctional emotions and behaviours (Young, 1999a). Although research in this area is still in its infancy, a possible direction for future research that may shed light on this finding is to examine "schema modes". According to Young et al. (2003), schema modes represent the moment-to-moment schemas, emotional and cognitive states as well as coping responses that are currently active for an individual. Young et al. (2003) have identified ten schema modes[24] that can be grouped into four broad categories: (i) Child Modes, (ii) Maladaptive Coping Modes, (iii) Dysfunctional Parent Modes, and (iv) the Healthy Adult Mode (see Young et al., 2003). While preliminary studies into the psychometric properties of the short and long versions of the *Schema Mode Inventory* (Young et al., 2007) have been carried out (e.g., Lobbestael, Van Vreeswijk, Spinhoven, Schouten, & Arntz, 2010), additional studies examining the scale's reliability and validity are necessary, followed by investigations into which forms of psychopathology are associated most strongly with the various schema modes (e.g., see Arntz, Klokman, & Sieswerda, 2005).

Avoidance and Social Anxiety

The present study revealed that there was a significant relationship between avoidant coping styles and *trait* social anxiety in the high-SIAS but not the low-SIAS group. As previously mentioned, avoidance has featured prominently in the major models of social anxiety (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997) with clinical evidence

[24] Please note that additional schema modes have since been identified (see Lobbestael et al., 2008).

suggesting that individuals with social anxiety regularly avoid social situations or utilise safety behaviours, such as drinking excessive amounts of alcohol, in order to cope with negatively perceived or threatening social situations (Morrison & Heimberg, 2013). Within schema therapy theory, this coping mechanism also appears to be used by individuals with social anxiety in order to avoid the thoughts, feelings and emotions associated with EMS.

These findings further highlight the need to address the role of avoidance when working with this population in clinical settings as this form of coping may affect the treatment outcomes used, as well as the development of the therapeutic relationship. For instance, clients who use avoidance strategies are perhaps more likely to avoid facing their fears in behavioural exposure hierarchies, lack insight into their schemas and/or raise superficial issues, arrive late to sessions or terminate treatment prematurely (Young et al., 2003). Although the authors (Mairet, Boag & Warburton, 2014) failed to confirm the factor structure of the YRAI in a previous study using a non-clinical sample, future research would benefit from examining whether individuals with SAD primarily rely upon cognitive, emotional, behavioural and/or somatic forms of avoidance in order to enhance therapeutic success with this population.

In contrast to the construct of a schema which is primarily considered a trait phenomenon in schema therapy theory, Young (1999a) and colleagues (Young et al., 2003) distinguish between avoidant coping responses (state) and styles (trait). The results of the present study suggest that individuals low on social interaction anxiety do not need to rely as heavily upon avoidance strategies to cope. While this relationship was not significant in the high-SIAS group at baseline, participants were significantly more likely to use avoidance strategies when they were informed about the speech task. Interestingly, this relationship was no longer significant following the presentation of the subliminal cue in the high-SIAS group. While future research is needed to replicate these results, it is possible that avoidant coping responses were activated in the high-SIAS group when the threat was consciously perceived and evaluated; however these defence mechanisms were not triggered when the threat (i.e.

subliminal stimuli) was processed outside of awareness. This hypothesis appears to be in line with Silverman's (1983) claims that subliminal stimuli bypass defences, such as avoidance, and affect latter behaviour.

Effects of the Visual Subliminal Cues on Levels of State Social Anxiety

Previous research has demonstrated that subliminal threat cues, including abandonment-related stimuli (e.g., "lonely"), facilitate eating behaviours (e.g., Meyer & Waller, 1999) while counter-schematic subliminal cues (e.g., "friendship") may have an ameliorative effect and reduce the amounts eaten by women (e.g., Waller & Barter, 2005). Although there was a significant increase in social anxiety scores over time, the present study did not find significant differences between levels of self-reported state social anxiety between groups of students who received the subliminal *Disconnection and Rejection* ("mummy does not love me"), counter-schematic ("mummy does love me") or neutral ("mummy is walking") cue in either the low-SIAS or high-SIAS groups. Interestingly, the low-SIAS (Figure 1) and combined low and high-SIAS groups (Figure 3) displayed similar trends which were counter to what was predicted with the neutral cue associated with the highest level of state social anxiety, followed by the counter-schematic cue and then the *Disconnection and Rejection* cue. On the other hand, the high-SIAS group displayed a trend in the predicted direction with the group receiving the *Disconnection and Rejection* cue having the highest levels of state social anxiety, followed by the neutral group and then the counter-schematic group.

The results provide preliminary evidence that threatening information is perhaps processed differently by individuals low and high on social interaction anxiety. These findings may also provide evidence for Beck and Clark's (1997) cognitive model of anxiety which stipulates that individuals first automatically and rapidly process the valence (neutral, positive or negative) and/or personal relevance of the information in order to identify whether it is threatening or not (i.e. the *orienting mode*). In the case of anxiety, Beck and Clark (1997) hypothesised that individuals high on this trait are more likely to selectively attend to negative, personally relevant information which leads to what they describe as the "immediate

preparation" stage which activates, for instance, hypervigilance for threatening stimuli and autonomic arousal (i.e. processing the body for flight, fight or freeze).

According to Beck and Clark's model (1997), the treatment of anxiety needs to involve the deactivation of the automatic, hyper-vigilant "threat mode" in order to strengthen the secondary, and more elaborative ways of thinking. In other words, Beck and Clark (1997) propose that the treatment of anxiety should aim at reducing the influence of Stage 2 (*immediate preparation* stage) processing and strengthen the processes identified in Stage 3 (*secondary elaboration* stage) of their model. While the differences between groups were not significant in the high-SIAS group, the preliminary findings in the present study indicate that, while schema-consistent stimuli increase levels of state social anxiety, counter-schematic stimuli may have an ameliorative effect. Although unlikely to be a therapeutic technique on its own, subliminal presentations of counter-schematic cues may reduce the activation of the "threat mode" long enough to elaborate on more constructive ways of processing information.

Strengths, limitations and directions for future research

The current study makes an important contribution to the field as it is believed to be the first to address Young and colleagues' (Young et al., 2003) biological theory of schemas by applying Beck and Clark's (1997) schema-based information processing model of anxiety. Further, it is the first study to examine the effects of visual subliminal schema-consistent and counter-schematic stimuli on levels of social anxiety. The study also provides important theoretical and clinical information about the important roles of *Disconnection and Rejection* schemas as well as avoidance coping responses and styles in the aetiology of social anxiety.

Although the present study contributes to our understanding of the relationship between *Disconnection and Rejection* schemas, avoidance and social anxiety, there are several limitations that should be noted. First, the current study has not been carried out longitudinally which limits the ability to ascribe causality. For instance, it is difficult to ascertain whether *Disconnection and Rejection* schemas (or avoidant coping strategies) generate higher levels of social anxiety or vice versa. Second, future studies may benefit from

controlling for the overlap between social anxiety and other psychological problems, such as depressive symptomatology as the high correlation between these two psychopathologies makes it difficult to distinguish the different cognitive characteristics and schemas associated with these affective disorders (Calvete, Estévez, López de Arroyabe, & Ruiz, 2005). Third, although previous subliminal studies have found significant results in non-clinical samples, the current study should be replicated in a clinical sample of individuals experiencing SAD where the variables of interest, including social anxiety, avoidance and EMS may be comparatively higher than the present non-clinical sample.

Another limitation is the reliance upon self-reported state social anxiety scores as opposed to physiological or behavioural measures. Although past research utilising the subliminal methodology has successfully used skin conductance levels to measure participants' levels of emotional reactivity, GSR ratings did not appear to provide meaningful results in the present study. It is possible that alternative physiological measures, such as heart rate or fMRI, and behavioural measures, such as eye tracking, may provide better indices of responsiveness to subliminal stimuli.

In terms of the subliminal stimuli applied, future studies could assess whether stimuli with different attachment figures (e.g., "mummy/daddy does not love me") and without an attachment figure (e.g., "unloved") have similar outcomes. Finally, although the neutral cue "mummy is walking" has been used successfully in numerous subliminal studies (see Weinberger & Silverman, 1990), it is possible that this cue could have been interpreted as a significant other rejecting or abandoning them. Therefore, alternative neutral cues could perhaps be trialled, such as "mummy is eating toast".

Conclusion

Although future subliminal research incorporating behavioural and/or physiological measures in both non-clinical and clinical samples is necessary, the results of the current preliminary study appear to be consistent with Young et al.'s (2003) schema therapy theory and Beck and Clark's (1997) schema-based information processing model of anxiety in

suggesting that threatening information is processed pre-consciously. In line with previous studies investigating the relationship between EMS and eating disorder symptomatology, the results of the current preliminary study suggest that experimental research utilising subliminal methodologies warrant further exploration given the potential to both identify and possibly treat a range of psychological disorders, including chronic anxiety, using this method.

While future research needs to both replicate and extend upon the purported relationship between these variables within a clinical sample, there are nonetheless clinical implications of the aforementioned findings including the importance of considering individuals' avoidance strategies, *Disconnection and Rejection* schemas and information processing biases when assessing and treating individuals displaying high social anxiety and SAD symptomatology.

Chapter 6

General Discussion

Introduction to General Discussion

The aim of this thesis was to explore several of the theoretical pathways proposed by Young's schema therapy model in relation to social anxiety. As such, this research encompassed four papers examining factors that Young (1990; 1999a) and colleagues (Young et al., 2003) propose as important in the aetiology of early maladaptive schemas (EMS), including culture, negative parenting practices, temperament, coping styles and unconscious processes. Collectively, the findings of these studies provide increasing evidence to support numerous aspects of Young and colleagues' (Young et al., 2003) schema therapy theory; however, some findings were inconsistent with the proposed pathways or identified areas that require further theoretical development. The present discussion will therefore consist of a review of the relevant findings pertaining to each study, followed by the concomitant theoretical and clinical implications. Finally, strengths and limitations of the thesis will be presented, along with suggestions for future research.

Overview of Findings

Consistent with Young's proposal, Study 1 presented in Chapter 2 demonstrated that culture does appear to play an important role in the aetiology of EMS. Specifically, compared to Australian students, Chinese students residing in Hong Kong and Australia displayed higher EMS related to the domains of *Impaired Autonomy and Performance, Impaired Limits* and *Overvigilance and Inhibition,* independent of social anxiety. It was suggested that perhaps these findings are best understood in the context of a collectivistic culture which encourages deference to parents, self-restraint and social harmony, as well as the different parenting practices observed in Australian (individualistic) and Chinese (collectivistic) cultures. For instance, research indicates that Chinese parents tend to hold higher standards for their children, have more enmeshed relationships with their children and are more overprotective of their children compared to their Western counterparts (e.g., Chen et al., 1998) which may impact upon the formation and maintenance of certain schemas.

Although cross-cultural differences were apparent concerning the aforementioned schema domains, the results revealed that both similarities and differences were apparent between the Australian and Chinese samples in relation to the *Disconnection and Rejection* as well as *Other-directedness* domains. For example, while the Hong Kong sample displayed significantly higher *Disconnection and Rejection* scores compared to the Australian sample, there was no significant difference between the Hong Kong and Chinese-Australian or Chinese-Australian and Australian samples. Likewise, compared to the Australian sample, the Chinese-Australian sample had significantly higher scores related to the *Other-directedness* domain, however there were no significant differences between the Hong Kong and Australian or the Hong Kong and Chinese-Australian samples. Two hypotheses were proposed to explain these findings (i) the different parenting practices observed in Western and Eastern cultures might have led to differing schemas (i.e. *Disconnection and Rejection* schemas), and (ii) when Chinese students moved from a collectivistic culture to a country with different more individualistic values (i.e. Australia) this might have led to an increased focus on the feelings and desires of others in order to increase one's sense of connection resulting in higher *Other-directedness* schemas.

The second part of Study 1 investigated the association between Young's schema domains and social anxiety. Consistent with extant literature demonstrating a relationship between *Disconnection and Rejection* schemas and social anxiety in adult samples (e.g., Calvete & Orue, 2008; Pinto-Gouveia, Castilho, Galhardo, & Cunha, 2006), Study 1 revealed that Australian students who score higher on social anxiety symptomatology tend to score higher on EMS related to the expectation that their needs for safe, stable, nurturing and trustworthy relationships would not be met in a predictable manner (i.e. schemas themed around disconnection and rejection). However, the findings from Study 1 extend those that have previously been obtained in Western cultures by suggesting that this relationship also occurs in Chinese cultures.

An additional finding was that schemas from the *Impaired Autonomy and Performance* domain are also associated with social anxiety within both the Australian and Chinese adult samples (except the *Social Phobia Scale* in the Hong Kong sample). Consistent with Calvete's (2014) findings, Study 1 lends support to the suggestion that schemas related to *Disconnection and Rejection* and *Impaired Autonomy and Performance* play particularly important roles in the aetiology of social anxiety. Contrary to Calvete et al.'s (2014) findings, however, there did not appear to be a significant relationship between *Other-directedness* schemas and social anxiety in either the Australian or Chinese samples. As mentioned in the General Introduction, it is plausible that this domain was found to be notably higher in Calvete's (2014) study given that the sample was comprised of adolescents. Some indication of this may be provided by Erik Erikson's (1968) psychosocial theory of development, where identity is the central crisis and peers become more influential than parents in terms of approval. Thus it is possible that adolescence is a time when *approval seeking* and *subjugation* schemas are at their peak because individuals have a strong need for approval so, beyond their cultural norm which could be adaptive, they surrender control to peers in order to avoid rejection.

Importantly, the domains of *Disconnection and Rejection* as well as *Impaired Autonomy and Performance* theoretically correspond to two forms of parenting which are commonly associated with the development and maintenance of social anxiety in Western cultures, these being cold or rejecting parenting and overprotective parenting, respectively (e.g., Eastburg & Johnson, 1990; Klonsky, Dutton, & Liebel, 1990). In fact, the results of Study 2 demonstrate that there is a significant relationship between overprotective parenting and social anxiety (as measured by the *Social Phobia Scale* or SPS, and *Social Interaction Scale* or SIAS) in both the Australian and the Chinese samples. These findings lend further support to the supposition that parenting that seemingly diminishes a child's ability to function and become appropriately independent, which may ultimately increase their levels of anxiety in new or

unfamiliar situations (Brook & Schmidt, 2008), may play an important role in the aetiology of social anxiety in both Australian and Chinese cultures.

Unlike perceived overprotective parenting, perceived cold and rejecting parenting was significantly related to both fears of social interaction (as measured by the SIAS) and fears of social scrutiny (as measured by the SPS) in the Australian sample. However this form of parenting was only related to fears of social scrutiny in the Chinese-Australian sample, and did not have a significant relationship with either the SIAS or the SPS in the Hong Kong sample. Thus, the results of Study 2 suggest that perceived overprotective parenting has a stronger relationship with social anxiety in Chinese individuals than perceived cold or rejecting parenting while both overprotective and cold or rejecting parenting are related to social anxiety in Australian individuals. As mentioned in Study 2, it is possible that perceived cold or rejecting parenting in the Australian sample increases the likelihood of developing an insecure attachment which may in turn increase the risk of developing social anxiety (Brook & Schmidt, 2008).

Although Studies 1 and 2 indicated that there is a significant relationship between *Disconnection and Rejection* schemas and social anxiety in both Chinese samples, there was no significant relationship between cold or rejecting parenting (i.e. the *Disconnection and Rejection* domain of the YPI) and social anxiety (except with the SPS in the Chinese-Australian sample). Consequently, three possibilities present themselves (i) culture does become increasingly important in shaping people's EMS as they get older, as suggested by Young et al. (2003), particularly when they come from collectivistic cultures where social harmony and group cohesion is important, (ii) Chinese parents are, in fact, perceived to be less cold and rejecting which decreases the chances of children forming insecure attachments, and/or (iii) culture influences what is considered positive or accepted parenting practices. Hence, what is considered "cold" or "rejecting" parenting potentially varies by culture according to the meaning attached to certain behaviours. For instance, as mentioned in Study 2, "parental care, concern, and involvement are synonymous with firm control and

governance of the child" (Chao, 1994, p. 1112) in Chinese culture which is reflected in the term "guan". This is in contrast to Western parenting which is typically considered more facilitative rather than directive (Stewart et al., 2002). Therefore, culture may provide an important contextual source of information that influences how parents approach child rearing.

Of the remaining significant relationships between perceived cold or rejecting and overprotective parenting and social anxiety, the results of Study 2 further indicated that EMS partially mediate the relationship between perceived negative and social anxiety in both the Australian and Chinese samples. Specifically, the relationship between perceived cold or rejecting parenting in the Australian sample and overprotective parenting in each of the samples in relation to the SIAS was mediated by schemas themed around *practical incompetence/dependence*, *emotional inhibition* and *social isolation*, with some variation across samples. On the other hand, the relationship between perceived cold or rejecting and the SPS was mediated by *abandonment* and *subjugation* schemas in the Australian sample and *emotional inhibition, enmeshment* and *emotional deprivation* schemas in the Chinese samples, with some variation across samples. Thus, compared to results pertaining to social interaction anxiety (as measured by the SIAS), the results display greater cross-cultural variation in relation to fears of social scrutiny (as measured by the SPS). For example, the results concerning *enmeshment* schemas in the remaining Chinese analyses appear to be consistent with previous literature suggesting that Chinese parents, particularly mothers, are extremely devoted to their children which may lead to excessive emotional involvement.

In summary, the findings of Studies 1 and 2 presented in Chapters 2 and 3 provide support for schema therapy theory given they suggest that (i) culture is important in the aetiology of EMS, (ii) significant life events (i.e. moving to a foreign country) may alter EMS, (iii) *Disconnection and Rejection* as well *as Impaired Autonomy and Performance* schemas appear particularly important in the aetiology of social anxiety in both Australian and Chinese adult samples, (iv) perceived overprotective parenting is important in the

aetiology of social anxiety in both Australian and Chinese individuals, whereas perceived cold or rejecting parenting is related to the aetiology of social anxiety primarily in Australian individuals, and (v) EMS appear to partially mediate the relationship between perceived negative parenting practices (i.e. overprotective and cold or rejecting) and social anxiety.

Young et al. (2003) assert that individuals' emotional temperament and coping styles are important in the aetiology of EMS. Consequently, the aim of Study 3 presented in Chapter 4 was to examine the relationship between temperament (i.e. introversion and neuroticism), coping styles (i.e. avoidance and compensation), *Disconnection and Rejection* schemas and social anxiety. Consistent with findings from Studies 1 and 2, Study 3 provided additional support for the supposition that *Disconnection and Rejection* schemas are associated with higher social anxiety in Australian adults. In line with Young's et al.'s (2003) theory, Study 3 also revealed that temperament does appear to influence the types of coping style/s individuals adopt. For example, consistent with models of social anxiety (e.g., Clark & Wells, 1995; Rapee & Heimberg, 1997), and extant literature demonstrating a relationship between social anxiety and avoidance (e.g., Morrison & Heimberg, 2013), the findings of this study suggest that introverted individuals are more likely to utilise avoidance as opposed to overcompensation coping styles. In contrast, there was no significant difference between the use of avoidant as opposed to overcompensation strategies by individuals scoring high on neuroticism.

However, contrary to Young's et al.'s (2003) conjecture that "temperament probably plays a greater role in determining patients' coping styles than it does in determining their schemas (p. 35), there was a significantly stronger relationship between neuroticism and *Disconnection and Rejection* schemas than neuroticism and avoidant or overcompensation coping styles. Additionally, the relationship between neuroticism and *Disconnection and Rejection* schemas was stronger than the relationship between neuroticism and social anxiety. These findings provide evidence to support the increasing body of research suggesting a strong association between neuroticism and EMS (e.g., Muris, 2006; Sava, 2009; Thimm,

2010a). Finally, using path analysis, Study 3 provided preliminary evidence for Young et al.'s (2003) hypothesis that there is a relationship between coping styles and EMS, with the suggestion that there is perhaps a stronger relationship from EMS to coping styles than vice versa. That is, it is possible that an individual's EMS (e.g., *Disconnection and Rejection*) influences the coping strategies (e.g., avoidance) they adopt. Alternatively, a bidirectional relationship between EMS and coping styles may exist, similar to Calvete, Orue, and Hankin's (2013) study. However, as mentioned in Study 3, no causal claims can be inferred in the present research due to the cross-sectional nature of study.

In summary, the results obtained in Study 3 suggest that (i) *Disconnection and Rejection* schemas are associated with social anxiety in Australian adults, (ii) temperament possibly influences the coping styles people adopt (e.g., introverted individuals appear to use more avoidant coping strategies), (iii) there is a strong relationship between neuroticism and *Disconnection and Rejection* EMS, and (iv) there is a relationship between individuals' coping styles and EMS; however further research is necessary to determine the direction of that relationship.

Next, given that Young et al. (2003) propose that threatening information related to EMS is initially processed pre-consciously, Study 4 presented in Chapter 5 explored whether or not threatening information is processed outside awareness by drawing upon Beck and Clark's (1997) revised schema-based information processing model of anxiety. The results of this study were significant for several reasons. First, consistent with Studies 1, 2 and 3 of this thesis, the results of Study 4 revealed that a significant association exists between *Disconnection and Rejection* schemas and social anxiety. However, Study 4 extended upon the aforementioned studies by suggesting that this relationship applies to *trait*, as opposed to *state*, social anxiety. How this finding relates to schema therapy theory will be elaborated upon in the subsequent section concerning the theoretical implications of the findings.

Second, the results provided further evidence to support the supposition that there is a significant relationship between avoidant coping strategies and *trait* social anxiety in

individuals displaying high social interaction anxiety (as measured by the SIAS). Therefore, it appears that individuals high on social anxiety are more likely to use avoidant coping strategies over time, such as avoiding feared thoughts, emotions or social situations. Third, the findings suggested that there is a significant relationship between avoidance strategies and *state* social anxiety in the high-*Social Interaction Anxiety Scale* (SIAS) group, however only following the announcement of the five minute speech task rather than at baseline or following the presentation of the subliminal cues. These findings suggest that, although individuals who score high on the SIAS may adopt avoidant coping responses when threatening information is consciously perceived, avoidant coping responses may not be activated when the threat (i.e. subliminal stimuli related to EMS) is processed outside of awareness. Nevertheless, given that this is believed to be the first study addressing this issue, further research is necessary before firm conclusions can be drawn.

Unlike previous research which has demonstrated that subliminal threat cues facilitate eating behaviours (e.g., Meyer & Waller, 1999; Patton, 1992; Waller & Barter, 2005) while counter-schematic subliminal stimuli have an ameliorative effect and reduces such behaviours (e.g., Waller & Barter, 2005), Study 4 did not reveal any significant differences in self-reported state social anxiety between groups of Australian students who received a subliminal *Disconnection and Rejection* (i.e. "mummy does not love me"), counter-schematic (i.e. "mummy does love me") or neutral (i.e. "mummy is walking") cues in either the low-SIAS or high-SIAS groups. Nevertheless, there did appear to be a trend in the predicted direction regarding the high-SIAS group, with individuals in the *Disconnection and Rejection* (negative) group revealing the highest levels of self-reported state social anxiety, followed by the neutral group and then the counter-schematic (positive) group. This was in contrast to the results obtained concerning low-SIAS and combined low and high-SIAS groups whereby the neutral group had the highest self-reported state social anxiety scores, followed by the counter-schematic (positive) group and then the group who received the *Disconnection and Rejection* cue (negative). Consequently, it is conceivable that the results of Study 4 provide

preliminary support for Beck and Clark's (1997) proposal that threatening information may be processed differently by individuals who are low and high on anxiety.

In summary, the results of Study 4 suggest that (i) there is a relationship between *Disconnection and Rejection* schemas and trait social anxiety, (ii) there is a relationship between avoidance coping strategies and trait social anxiety, (iii) as well as avoidance and state social anxiety in the high-SIAS group, however, only when threatening stimuli are consciously perceived, (iv) EMS are processed, to some degree, pre-consciously, and (v) although the difference between groups was non-significant, there was a trend in the predicted direction concerning the high-SIAS group, suggesting that threatening information is perhaps processed differently by individuals who are high as opposed to low on social interaction anxiety.

Theoretical Implications

As previously mentioned, the primary aim of the current thesis was to examine a number of the theoretical pathways proposed by Young's schema therapy model given that the majority of the previous schema research has focused upon certain pathways (e.g., EMS domains associated with particular disorders) and psychopathologies (e.g., Borderline Personality Disorder and eating disorders). Therefore, the present research explored a range of theoretical pathways hypothesised to be important by Young and colleagues (Young et al., 2003) in relation to social anxiety, an area which has received scarce attention in the literature. Thus this review will include findings that support and others that appear to contradict Young's schema model, as well as highlight areas that may require further theoretical development.

First, schema therapy proponents have long presumed that there is a significant relationship between maladaptive schemas and various forms of psychopathologies (e.g., Young, 1990; Young et al., 2003). Consistent with previous research (e.g., Calvete 2014), the results of Studies 1 and 2 provide further support for the supposition that there is a

relationship between *Disconnection and Rejection* as well as *Impaired Autonomy and Performance* schemas and social anxiety in both Australian and Chinese cultures.

Second, theory and research suggests that EMS are fairly stable constructs (e.g., Stallard, 2007), however it is assumed that they may alter as a result of psychotherapy or significant life experiences (Young et al., 2003). Therefore, a secondary aim of Study 1 was to examine whether Hong Kong and Chinese-Australian participants display similar EMS domains, despite the Chinese-Australian sample experiencing a significant life event (i.e. moving to a foreign country). Although the aforesaid results revealed that there are no significant differences between the Hong Kong and Chinese-Australian samples when EMS domains were investigated independent of social anxiety, differences appeared when social anxiety was taken into account. In particular, similarities emerged between the Chinese-Australian and Australian samples. These preliminary results raise the possibility that Chinese-Australians' EMS in relation to social anxiety altered when they moved from a collectivistic culture (Hong Kong) to a foreign country (Australia) with comparatively higher individualistic values. However, it is important to keep in mind that, due to the cross-sectional nature of this study, no causal inferences can be made.

Another fundamental assumption of schema therapy theory is that 'toxic' childhood experiences, which result from unmet childhood needs (e.g., secure attachments and autonomy), are the primary origin of EMS. The results obtained in Study 2 support Young et al.'s (2003) proposal that negative childhood experiences are associated with EMS. Further, the mediation analyses corroborate Young's belief that EMS mediate the relationship between negative parenting practices and psychopathologies. The *Young Parenting Inventory* (YPI) is considered to be one of the primary ways to identify the childhood origins of EMS. Consequently, Young et al. (2003) assert that "if a patient strongly endorses items on the YPI that reflect the typical origins of a schema, we frequently observe that the patient has that schema, even when the patient rated that schema low on the YSQ" (p. 78). Nevertheless, in line with Sheffield et al.'s (2005) findings, the results of Study 2 suggest that subscales from

the YPI do not necessarily map specifically onto the corresponding subscales of the *Young Schema Questionnaire* (YSQ). This provides further evidence that perceived negative parenting practices tend to make individuals more susceptible to developing a group of EMS rather than one EMS in particular.

Although the results obtained in Studies 1 and 2 suggest that schema therapy theory may apply at a global level (e.g., that EMS are associated with various psychopathologies), it was proposed that certain cultural nuances are potentially overlooked by schema therapy theory and its associated inventories. For instance, as suggested in Study 2, whilst it is possible that children from divergent cultural backgrounds share similar core emotional needs such as secure attachments and autonomy, as Young et al. (2003) suggest, the ways in which parents fulfil these needs may vary by culture. For instance, as mentioned in Study 2, rather than showing a child that you love them using verbal and/or physical affection, including kissing, hugging and touching, parental warmth may be expressed through alternative subtle and/or symbolic gestures, such as gift giving (Liu & Guo, 2010). As a result, the inventories used to assess the origins of EMS, such as the *Young Parenting Inventory*, which theoretically relate to Western considerations of what constitutes both positive and negative parenting practices, may not be sensitive to these alternative displays of intimacy.

In support of Young's schema therapy model, the results obtained in Study 3 suggest that temperament could be important in the aetiology of EMS and might be "one of the main factors", as Young believes, that determines an individuals' coping styles (Young et al., 2003, p. 35). For example, more introverted individuals were more likely to use avoidance as opposed to overcompensation strategies. Nonetheless, contrary to Young's conjecture that "temperament probably plays a greater role in determining patients' coping styles than it does in determining their schemas" (Young et al., 2003, p. 35), the results revealed that there appears to be a stronger relationship between neuroticism and *Disconnection and Rejection* schemas compared to either avoidance or overcompensation coping strategies. Therefore, it is conceivable that an individual's temperament may influence the development and/or

maintenance of their EMS as much as their coping strategies. Moreover, it remains unclear whether EMS affect the coping styles that individuals adopt or vice versa given the cross-sectional nature of the study. As mentioned in Study 3, it is also conceivable that a bidirectional relationship also exists whereby EMS affect the coping strategies people use and these reciprocally perpetuate their EMS. In light of this, further theoretical development is necessary regarding the relationship between temperament, coping strategies, EMS and psychopathologies, including social anxiety.

Consistent with Young et al.'s (2003) proposition that EMS are primarily a trait as opposed to state phenomena, Study 4 demonstrated that there is a stronger association between *Disconnection and Rejection* schemas and trait, as opposed to state, social anxiety. While Young et al. (2003) suggest that EMS tell us more about how a client is functioning over time, rather than their current state, these authors distinguish between both coping styles (trait) and responses (state). The results obtained in Study 4 support this hypothesis given that individuals high in social interaction anxiety were more likely to use avoidant coping styles, as well as use avoidant coping responses when threatening information is consciously perceived.

Finally, Young et al. (2003) suggest that EMS are, at least to a degree, unconscious. Therefore, the aim of Study 4 was to investigate whether or not threatening information related to EMS is processed pre-consciously by drawing on Beck and Clark's (1997) revised schema-based information processing model of anxiety. Although there were no significant differences between the groups who received a subliminal schema congruent (negative), counter-schematic (positive) or neutral cue, the results may provide preliminary evidence that threatening information related to EMS is processed differently by individuals who are low or high on social interaction anxiety.

Clinical Implications

The findings from this research also have important implications for the assessment and treatment of social anxiety and SAD. First, as with other forms of therapy, the cultural background of the client should be considered during the "Assessment and Education Phase" as well as "Change Phase" in schema therapy. Currently the assessment, diagnosis and treatment of presenting problems, including social anxiety, are guided primarily by Western conceptualisations of psychopathologies (Dinnel, Kleinknecht, & Tanaka-Matsumi, 2002). Therefore, therapists need to be aware of their own cultural biases during assessment and treatment phases to prevent the premature termination of therapy by clients. For instance, therapists may be led to believe that a client grew up in a cold or rejecting environment based on low scores on particular items contained in scales (e.g., my mother/father "was warm and physically affectionate"; item 5 of the *Young Parenting Inventory*). However, as previously mentioned, a client's low endorsement of such items may represent different norms associated with parenting practices due to cultural influences. Additionally, modifications to therapy, such as being open to enquiring about what is considered normal or abnormal (e.g., different parenting practices) within a particular culture, may enhance the therapeutic relationship as well as treatment outcomes (Leong & Lau, 2001).

It is also important to note, however, that individuals from Asian cultures typically prefer to keep information regarding their family within this kinship domain as the disclosure of difficulties is believed to bring shame to the extended family and wider community (Leong & Lau, 2001). Given that EMS are believed to primarily develop as a result of 'toxic' childhood experiences, Chinese clients may have difficulty being open about their childhood and/or speaking negatively about their parents with a therapist who is considered a stranger (Leong & Lau, 2001). Therefore, therapists need to be sensitive to such issues when working with this population and remain patient as Chinese clients build trust in the therapeutic relationship. Notably, with a lack of controlled clinical outcome studies involving Chinese individuals, any conclusions about the effectiveness of schema therapy for Chinese

individuals is premature. Consequently, there is a need for future research to empirically test the utility of schema therapy related to social anxiety and SAD both in general, as well as in relation to specific cultural backgrounds.

Second, increasing evidence indicates that *Disconnection and Rejection* as well as *Impaired Autonomy and Performance* schemas in particular should be examined when working with clients who score higher on social anxiety or SAD. It is also important for therapists to keep in mind how such schemas may influence the therapeutic relationship (Young et al., 2003). For instance, clients who endorse higher *Disconnection and Rejection* schemas may expect their therapist to abandon them (*abandonment* schema), take longer to trust their therapist (*mistrust* schema), may not expect the therapist to nurture or understand them (*emotional deprivation* schema), might avoid getting too close to their therapist in case the therapist sees their perceived defects (*defectiveness* schema) and/or seem distanced or avoid connecting with their therapist (*social isolation* schema). Similarly, as noted by Young et al. (2003, see p. 186), therapists need to become aware of their own schemas and coping styles when working with clients.

Third, in addition to previous research (e.g., Morrison & Heimberg, 2013), the results of Studies 3 and 4 further indicate that schema therapists would benefit from assessing for, and paying particular attention to, the use of avoidance strategies when working with individuals with social anxiety. The use of avoidance responses and styles also has important implications for the therapeutic relationship. For example, clients may lack insight into their schemas or raise superficial issues to avoid discussing their underlying problems, avoid attempting difficult behavioural experiments or avoid attending sessions. Study 3 also revealed that there is perhaps a stronger relationship between EMS and coping styles, or a bidirectional relationship. This may support Young et al.'s (2003) proposal that treating EMS is usually the primary goal of therapy given that "eliminating maladaptive coping responses permanently is almost impossible without changing the schemas that drive them" (p. 37). Given that schema

therapy places a much greater emphasis on maladaptive schemas and core beliefs compared to traditional CBT this might be an important area for schema related research.

Fourth, the results obtained in Study 3 suggest that an individual's temperament should also be considered when assessing the relationship between EMS, coping styles and social anxiety. For example, individuals who are more introverted and/or use avoidant coping styles may improve more quickly in traditional CBT programs where exposure to avoided cognitions, situations or behaviours is emphasised. On the other hand, individuals scoring higher on neuroticism may benefit from schema therapy or schema-focused CBT due to the stronger relationship between neuroticism and EMS than neuroticism and coping styles.

Finally, past research indicates that the subliminal presentation of threat related cues can influence unhelpful behaviours (e.g., eating) due to negative emotional activation while the presentation of counter-schematic subliminal cues may have an ameliorative effect on such behaviours (e.g., Waller & Barter, 2005). Although the differences between groups in the present thesis were not significant, there was a trend in the predicted direction in the high-SIAS group. Therefore, this could be a fruitful area for future research given that, as suggested in Study 4, subliminal stimuli may (i) assist in identifying EMS to target in treatment, (ii) serve as a diagnostic tool, (iii) assess change during the course of therapy, and (iv) identify counter-schematic stimuli that can be strengthened during the course of therapy. Moreover, counter-schematic cues may reduce the "primal threat mode" to allow constrictive ways of thinking in session (Beck & Clark, 1997).

Overall, while traditional CBT is still considered the most effective form of therapy for social anxiety and SAD, the results of this thesis provide support for Young et al.'s (2003) proposal that *some* individuals with chronic social anxiety or SAD and/or those who are observed to have more neurotic temperaments may benefit from schema focused CBT or schema therapy.

Strengths of the Present Research

The primary strength of this thesis lies in its examination of a diverse range of factors stipulated by Young et al. (2003) to be important in schema therapy theory. Furthermore, this thesis is believed to be one of the first steps towards examining whether cultural variations in Young et al.'s (2003) EMS domains exist and whether schema therapy may be viable in Chinese cultures. Additionally, unlike previous research which typically aggregates Asian samples (e.g., Lau, Fung, Wang, & Kang, 2009), the present research deliberately only recruited Chinese participants to obtain a more homogenous sample. Moreover, each inventory was both forward and back translated into Chinese to avoid priming effects due to individualistic values in both the Chinese-Australian and Hong Kong samples. Further, participants completed each of the inventories online in order to increase anonymity. This was particularly relevant given research indicating that Chinese individuals tend to avoid discussing personal issues, such as psychological symptoms and family matters, outside the kinship in order to "save face" (Leong & Lau, 2001).

Although the majority of previous studies have relied solely upon the *Social Interaction Anxiety Scale* (SIAS), the results of this thesis, particularly Studies 1 and 2, suggest that the *Social Phobia Scale* (SPS) also provides valuable information. The inclusion of the SPS was believed to be important for two reasons. First, research suggests that Chinese individuals tend to somatise their emotional distress due to the stigma attached to publicly discussing psychological symptoms outside the kinship (Leong & Lau, 2001). As such, Chinese individuals may feel more at ease completing the SPS, as opposed to the SIAS, given that it focuses more on the behavioural aspects of social anxiety. Second, important cross-cultural differences in the EMS that mediated the relationship between perceived negative parenting practices and social anxiety were identified using the SPS.

An additional strength of the thesis was the evaluation of the psychometric properties of two scales frequently utilised in clinical practice, despite limited research examining their psychometric properties, these being the *Young-Rygh Avoidance Inventory* and *Young*

Compensation Inventory. Finally, although Young et al. (2003) suggest that EMS are, to a degree, unconscious, and that individuals' coping styles, such as avoidance or overcompensation, may interfere with their ability to accurately report on their EMS, the vast majority of studies assessing EMS solely rely upon self-report methods. As such, Study 4 assessed whether or not EMS influence information processing pre-consciously using experimental methods.

Limitations of the Present Research

Although this research makes an important contribution to the understanding of the theoretical pathways proposed by Young (1990; 1999a) and colleagues (Young et al., 2003) in relation to social anxiety, there are a number of limitations worth mentioning. First and foremost, the cross-sectional nature of the studies does not allow causal inferences to be made. For instance, the direction of the relationship between coping styles and EMS remains unclear. Consequently, longitudinal research is necessary to further investigate the possibility of causal inferences. Second, each of the samples comprised of non-clinical Chinese (studies 1 and 2) and Australian (Studies 1 to 4) students making it difficult to generalise the findings to other demographics and cultures. Therefore, the findings should be replicated in a clinical sample given that EMS, coping strategies and information processing differences could be comparatively greater. Third, although many researchers still regard Hong Kong as primarily a Chinese culture (see Oyserman, Coon, & Kemmelmeier, 2002), it could be argued that Mainland Chinese hold more traditional views compared to their more Westernised counterparts living in Honk Hong. Fourth, there was a lack of statistical control of other affective disorders, such as depression, which may have influenced both EMS and coping strategies that people use. Fifth, each of the studies used self-report inventories which may be susceptible to biases. Finally, although self-reported state social anxiety was also recorded, the skin conductance results did not produce any meaningful results in Study 4. Therefore, the results relied solely upon self-reported social anxiety levels although GSR recordings might

have provided a valuable source of information regarding the unconscious processing of threatening information.

Future Research into Schema Therapy

Although there has been increasing interest in schema theory and therapy, many questions remain concerning the theoretical pathways proposed by Young et al. (2003). Therefore, in addition to the aforementioned issues, this section will briefly outline several areas related to schema therapy theory which might be worth pursuing in future research. First, despite the critical role that early developmental experiences are thought to play in the formation and maintenance of EMS, the vast majority of studies pertaining to schema therapy are conducted in adult samples (see Calvete et al., 2013; Rijkeboer & de Boo, 2010; Stallard, 2007; Van Vlierberghe, Braet, Bosmans, Rosseel, & Bögels, 2010 for exceptions). While studies involving adults provide valuable information about EMS, future research would benefit from further examining when EMS develop, how stable they are, what factors are most influential at different stages (e.g., culture and peers) in both child and adolescent samples. Moreover, given that Young et al. (2003) suggest that EMS are relatively stable constructs that only tend to alter as a result of psychotherapy or through other significant life experiences, another interesting area of research might be the stability of EMS (see Riso et al., 2006).

Although gender was controlled in Studies 1 to 4 of this thesis, gender differences in EMS were not directly examined. With research suggesting that girls and women display higher EMS (e.g., Calvete et al., 2014) and socially anxious symptomatology (Furmark, 2002), this may prove to be an interesting avenue for future research. Additionally, given the widespread use of Young's schema therapy inventories, future research should also continue to examine their psychometric properties, particularly the *Young Parenting Inventory*, *Young-Rygh Avoidance Inventory* and *Young Compensation Inventory*, in both Western and non-Western cultures.

Central to Young's schema theory is the concept of schema modes, defined as the "those schemas or schema operations – adaptive and maladaptive – that are currently active for an individual" (Young et al., 2003, p. 37). Although Young et al. (2003) propose that schema mode work "has become an integral part of schema therapy" (p. 271), limited studies have been carried out to empirically test the schema mode concept (see Arntz, Klokman, & Sieswerda, 2005; Bamelis, Renner, Heidkamp, & Arntz, 2010; Lobbestael, Van Vreeswijk, & Arntz, 2008 for exceptions), or its related *Schema Mode Inventory* (SMI; Young et al., 2007). Nevertheless, several studies have indicated that there is a positive association between schema modes and psychopathologies, including BPD (e.g., Arntz et al., 2005) and OCD (e.g., Thiel et al., 2014). Therefore, the relationship between schema modes and social anxiety or SAD, as well as the situations that trigger such modes, might be an interesting avenue of research for future experimental studies.

Finally, schema therapy literature almost exclusively focuses upon maladaptive schemas despite Young et al. (2003) proposing that adaptive schemas also exist. While some researchers have argued that for each EMS there is a corresponding adaptive schema (see Elliott & Lassen, 1997), few studies have been undertaken to validate or extend upon this aspect of schema therapy theory. This is unfortunate given that during the course of treatment, once maladaptive schemas have been identified and weakened, the possibility arises to construct or strengthen more adaptive schemas. In addition to strengthening the therapeutic relationship, this process may give the client an opportunity to identify their current strengths at a time when they might be feeling overwhelmed by their inadequacies and a sense of loss of control. Similarly, it would also be useful to identify certain protective factors that inhibit or reduce the impact of EMS (e.g., self-efficacy).

Summary and conclusions

Despite the wide-spread clinical utilisation of schema therapy and schema-focused therapy for various disorders, including chronic and/or complex anxiety, limited research has examined the theoretical pathways proposed by Young et al.'s (2003) schema model or its viability when treating clients with social anxiety and SAD. Therefore, the present thesis examined numerous factors proposed to be important in the aetiology of EMS, including culture, negative parenting practices, temperament, coping styles and unconscious processes.

For the most part, the results supported the underlying tenets of schema therapy theory, however some results were inconsistent with the proposed pathways or identified as necessitating further theoretical development. While the intention of this thesis was not to argue that schema therapy is a more appropriate form of therapy than traditional CBT for the treatment of social anxiety or SAD, the findings do support the belief that *some* individuals may benefit from this form of therapy. However, the findings also revealed that effective programs require schema therapists to consider a client's cultural background, perceived parenting practices, temperament, coping styles and information processing biases during the assessment, education and treatment phases of therapy. Although a considerable amount of research on schema therapy theory remains, it is hoped that this thesis has provoked thought into examining pathways that have received limited attention within the schema literature.

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Appendices

Appendix A - Description of the Eighteen Early Maladaptive Schema Subscales within Schema domains

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Domain 1. Disconnection and Rejection: The belief that one's need for security, safety, stability, nurturance, empathy, sharing of feelings, acceptance and respect will not be met in a predictable manner. Typical family of origin is characterised as detached, cold, unpredictable, explosive or rejecting.

1. *Abandonment (AB):* The belief that significant others will not be able to continue providing emotional support because they are emotionally unstable, will die or will abandon the person in favour of someone better.
2. *Mistrust/abuse (MA):* The belief that others will hurt, abuse, humiliate, cheat, lie, manipulate, or take advantage.
3. *Emotional deprivation (ED):* The belief that one's desire for a normal degree of emotional support will not be adequately met by others.
4. *Defectiveness/shame (DS):* The feeling that one is defective, bad, unwanted, inferior, or invalid in important respects or be unlovable.
5. *Social isolation/alienation (SI):* The feeling that one is isolated from the rest of the world, different from other people and/or not part of any group or community.

Domain 2. Impaired Autonomy and Performance: Beliefs regarding one's ability to separate and function independently from others. Typical family of origin is enmeshed, and fails to reinforce the child for performing competently outside the family and/or is overprotective.

6. *Dependence/incompetence:* The belief that one is unable to handle one's everyday responsibilities in a competent manner, without considerable help from others.
7. *Vulnerability to harm or illness (VH):* An exaggerated fear that imminent catastrophe will strike at any time and that one will be unable to prevent it.
8. *Enmeshment/undeveloped self (EM):* Excessive emotional involvement and closeness with one or more significant others, at the expense of full individuation or normal social development.
9. *Failure (FA):* The belief that one has failed, will inevitably fail, is fundamentally inadequate relative to one's peers, in areas of achievement

Domain 3. Impaired Limits: Deficiency in internal limits, responsibility to others, or long-term goal-orientation. Typical family origin is characterised by permissiveness, overindulgence, and/or a sense of superiority.

10. *Entitlement/grandiosity (ET):* The belief that one is superior to other people; entitled to special rights and privileges; or not bound by the normal rules of reciprocity that guide social interaction.
11. *Insufficient self-control/self-discipline (IS):* Pervasive difficulty or refusal to exercise sufficient self-control, low threshold of frustration when trying to achieve one's personal goals, poor restraint or the excessive expression of one's emotions and impulses. In its milder form, patients present with an exaggerated emphasis on discomfort avoidance: avoiding pain, confrontation, conflict, responsibility or overexertion.

Domain 4. Other-directedness: An excessive focus on the desires, feelings, and responses of others, at the expense of one's own needs. Typical family origin is based on conditional acceptance whereby children must supress important aspects of their own needs to gain attention, love and approval.

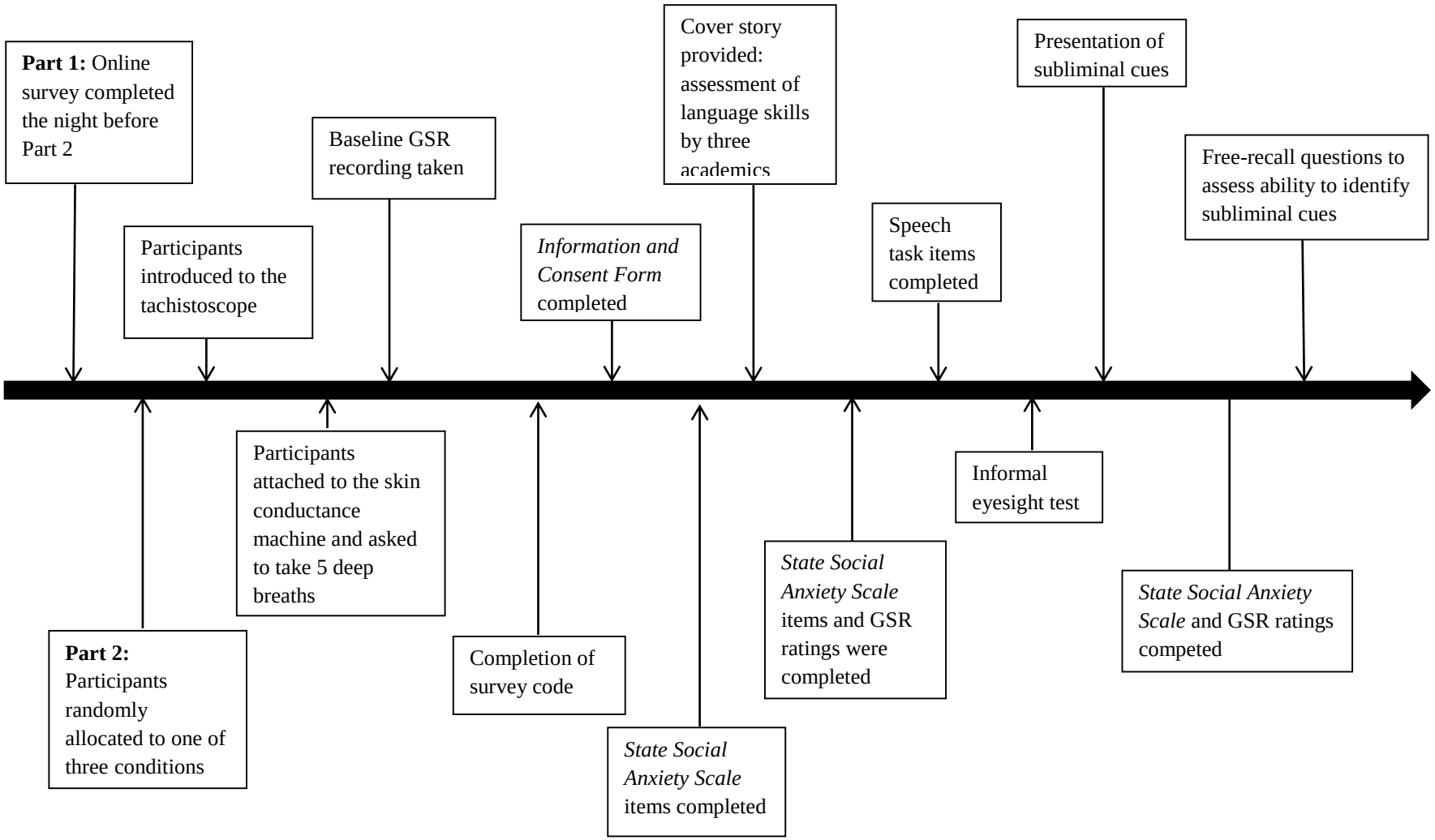
12. *Subjugation (SB):* excessive surrendering of control to others because one feels coerced- usually to avoid anger, retaliation or abandonment.
13. *Self-sacrifice (SS):* Excessive focus on voluntarily meeting the needs of others in daily situations, at the expense of one's own gratification.
14. *Approval seeking/recognition seeking (AS):* Excessive emphasis on the gaining of approval, recognition, or attention from other people, or fitting in, at the expense of developing a secure and true sense of self.

Domain 5. Overvigilance and Inhibition: Excessive emphasis on supressing one's spontaneous feelings, impulses, and choices OR on meeting rigid, internalised rules and expectations about performance and ethical behaviour. Typical family of origin is demanding, sometimes punitive and/or with some pessimism and worry.

15. *Negativity/pessimism (NP):* A pervasive, lifelong focus on negative aspects of life (e.g., pain, death etc.) while minimising or neglecting the positive or optimistic aspects.
16. *Emotional inhibition (EI):* The excessive inhibition of spontaneous action, feeling or communication—usually to avoid disapproval by others, feelings of shame, or losing control of one's impulses.
17. *Unrelenting standards/hypercriticalness (US):* The underlying belief that one must strive to meet very high internalised standards of behaviour and performance, usually to avoid criticism.
18. *Punitiveness (PU):* The belief that people should be harshly punished for their mistakes.

Note. An abbreviated version of Young's list of early maladaptive schema subscales within domains from the YSQ-S3 (2003).

Appendix B Study 4 Methodology Timeline



Appendix C - Partial correlations between the variables of interest in high and low socially anxious groups by cue type.

	2		3		4		5		6		7	
Variables	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*	*Low*	*High*
Neutral												
1. SIAS	.32	.66**	-.23	.37	.24	.47	.17	.31	.40	.45	.40	.37
2. SPS [a]	-	-	.35	.34	.18	.34	.20	-.27	.07	.52*	-.13	.42
3. State Social Anxiety (baseline)			-	-	.03	.40*	.36	.09	.13	.59*	-.50	.04
4. State Social Anxiety (speech task)					-	-	.72**	.27	.11	.25	.41	.48*
5. State Social Anxiety (post cue)							-	-	.29	-.09	.35	.14
6. Domain1[a]									-	-	.46	.04
7. YRAI											-	-
Positive												
1. SIAS	.61*	.43	-.06	.44	-.00	.51*	-.06	.32	.48	.29	.06	.55*
2. SPS [a]	-	-	-.09	.24	-.18	.18	.12	-.01	.60*	.50*	.04	.41
3. State Social Anxiety (baseline)			-	-	-.07	.71**	.23	.51*	-.26	.05	-.41	.26
4. State Social Anxiety (speech task)					-	-	.44	.61*	-.20	-.20	-.17	.28
5. State Social Anxiety (post cue)							-	-	.02	-.38	-.07	-.17
6. Domain1[a]									-	-	.17	.59*
7. YRAI											-	-
Negative												
1. SIAS	.93**	.29	.36	.66**	.07	.50	.52	.10	.60*	.53*	.17	-.00
2. SPS [a]	-	-	.44	.11	.29	.17	.47	.30	.63*	.50	.13	.01
3. State Social Anxiety (baseline)			-	-	.32	.49	-.10	.41	.64*	.15	-.01	-.15
4. State Social Anxiety (speech task)					-	-	.18	.22	.28	.36	.21	-.09
5. State Social Anxiety (post cue)							-	-	.14	.07	.07	-.23
6. Domain1[a]									-	-	.53*	-.18
7. YRAI											-	-

Note. Australian "high socially anxious group" $n = 45$, "low socially anxious group" $n = 44$. *SIAS:* Social Interaction Anxiety Scale; *SPS*: Social Phobia Scale; *State Social Anxiety Scale* (baseline, speech task and post cue scores); *Domain 1:* Disconnection and Rejection and *YRAI*: Young-Rygh Avoidance Inventory.

[a] Variables that have been Log10 transformed.

Note. *p <.05, ** p < .01.

Appendix D

Final Macquarie University Human Ethics Committee

Approval Letters

Dear Dr Boag

Re: "The relationship between perceived parental bonding, early maladaptive schemas and social anxiety"

(Ethics Ref: 5201100391)

Thank you for your recent correspondence. Your response has addressed the issues raised by the Human Research Ethics Committee and you may now commence your research.

The following personnel are authorised to conduct this research:

Dr Simon Boag- Chief Investigator/Supervisor
Miss Kathleen Mairet- Co-Investigator

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).

2. Approval will be for a period of five (5) years subject to the provision of annual reports. Your first progress report is due on 22 June 2012.

If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

6. At all times you are responsible for the ethical conduct of your research in accordance with the guidelines established by the University. This information is available at the following websites:

http://www.mq.edu.au/policy/

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/policy

If you will be applying for or have applied for internal or external funding for the above project it is your responsibility to provide the Macquarie University's Research Grants Management Assistant with a copy of this email as soon as possible. Internal and External funding agencies will not be informed that you have final approval for your project and funds will not be released until the Research Grants Management Assistant has received a copy of this email.

If you need to provide a hard copy letter of Final Approval to an external organisation as evidence that you have Final Approval, please do not hesitate to contact the Ethics Secretariat at the address below.

Please retain a copy of this email as this is your official notification of final ethics approval.

Yours sincerely
Dr Karolyn White
Director of Research Ethics
Chair, Human Research Ethics Committee

Dear Dr Boag

Re: "The relationship between personality, coping styles and friendship"

(Ethics Ref: 5201200106)

Thank you for your recent correspondence. Your response has addressed the issues raised by the Human Research Ethics Committee and you may now commence your research.

The following personnel are authorised to conduct this research:

Chief Investigator- Dr Simon Boag
Co-Investigator- Ms Kathleen Suzanne Mairet

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).

2. Approval will be for a period of five (5) years subject to the provision of annual reports. Your first progress report is due on 03 April 2013.

If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re-review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

4. All amendments to the project must be reviewed and approved by the Committee before implementation. Please complete and submit a Request for Amendment Form available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

5. Please notify the Committee immediately in the event of any adverse effects on participants or of any unforeseen events that affect the continued ethical acceptability of the project.

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Yours sincerely
Dr Karolyn White
Director of Research Ethics
Chair, Human Research Ethics Committee

Dear Dr Boag

Re: "The relationship between personality, subliminal exposure tasks and friendship"

(Ethics Ref: 5201200527)

Thank you for your recent correspondence. Your response has addressed the issues raised by the Human Research Ethics Committee and you may now commence your research.

This research meets the requirements of the National Statement on Ethical Conduct in Human Research (2007). The National Statement is available at the following web site:

http://www.nhmrc.gov.au/_files_nhmrc/publications/attachments/e72.pdf.

The following personnel are authorised to conduct this research:

Dr Simon Boag
Ms Kathleen Suzanne Mairet

NB. STUDENTS: IT IS YOUR RESPONSIBILITY TO KEEP A COPY OF THIS APPROVAL EMAIL TO SUBMIT WITH YOUR THESIS.

Please note the following standard requirements of approval:

1. The approval of this project is conditional upon your continuing compliance with the National Statement on Ethical Conduct in Human Research (2007).

2. Approval will be for a period of five (5) years subject to the provision of annual reports.

Progress Report 1 Due: 10 September 2013
Progress Report 2 Due: 10 September 2014
Progress Report 3 Due: 10 September 2015
Progress Report 4 Due: 10 September 2016
Final Report Due: 10 September 2017

NB. If you complete the work earlier than you had planned you must submit a Final Report as soon as the work is completed. If the project has been discontinued or not commenced for any reason, you are also required to submit a Final Report for the project.

Progress reports and Final Reports are available at the following website:

http://www.research.mq.edu.au/for/researchers/how_to_obtain_ethics_approval/human_research_ethics/forms

3. If the project has run for more than five (5) years you cannot renew approval for the project. You will need to complete and submit a Final Report and submit a new application for the project. (The five year limit on renewal of approvals allows the Committee to fully re review research in an environment where legislation, guidelines and requirements are continually changing, for example, new child protection and privacy laws).

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Please retain a copy of this email as this is your official notification of final ethics approval.

Yours sincerely
Dr Karolyn White
Director of Research Ethics
Chair, Human Research Ethics Committee