

A Cross-Cultural Examination of Explicit and Implicit Attitudes toward Shyness
in Canada and Mainland China

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Abstract

The aim of this doctoral dissertation was to explore explicit and implicit attitudes toward shyness among University students in Canada and mainland China. Study 1 explored differences in normative beliefs about shyness between samples of Canadian and Chinese students. Participants were $N = 1417$ undergraduate students from Shanghai, People's Republic of China ($N = 850$, $M_{age} = 18.83$ years, $SD = .92$) and Ontario, Canada ($N = 567$, $M_{age} = 19.7$ years, $SD = 2.14$). Participants completed assessments of normative beliefs about shyness and their own personality. Results from Study 1 indicated that, contrary to predictions, shyness was viewed more *negatively* in China as compared to Canada. As well, shy behaviours were viewed as more acceptable among participants who rated themselves as more shy. The goal of Study 2 and Study 3 was to further explore Canadian students' *implicit* attitudes about shyness. Undergraduate students (Study 1: $N = 66$, $M_{age} = 20.05$ years, $SD = 4.025$; Study 2: $N = 650$, $M_{age} = 19.93$ years, $SD = 4.327$) completed a newly developed Implicit Association Test (both in lab and online) related to shyness, as well as questionnaires about their own shyness and explicit beliefs about shyness. Consistent across both studies, results suggested that emerging adults automatically associated shyness with negative words, but participants who were more shy tended to have less negative implicit attitudes about shyness. The purpose of Study 4 was to investigate implicit attitudes toward shyness in China. Participants were undergraduate students ($N = 290$, $M_{age} = 20.3$ years, $SD = 1.97$) from Shanghai who completed a newly developed Chinese version of the Implicit Association Test (IAT) (online) related to shyness, as well as questionnaires of their own shyness and explicit beliefs about shyness. Results showed that Chinese emerging adults automatically associated

shyness with negative words as well. Results are discussed in terms of the implications of university students' attitude toward shyness in both cultures. Limitation and future directions are also discussed.

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A Cross-Cultural Examination of Explicit and Implicit Attitudes toward Shyness
in Canada and Mainland China

Shyness is a temperamental/personality trait characterized by heightened wariness and fear in novel social situations, as well as self-consciousness and social unease in situations perceived social evaluation (Rubin, Coplan, & Bowker, 2009). Across the lifespan, shyness is concurrently and predictively associated with a number of maladaptive adjustment outcomes including internalizing problems (Coplan, Ooi, & Rose-Krasnor, 2014; Katz, Conway, Hammen, Brennan, & Najman, 2011) and social difficulties (Newcomb, Bukowski, & Pattee, 1993; Rubin, Wojslawowicz, Rose-Krasnor, Booth-LaForce, & Burgess, 2006; Sette, Baldwin, Zava, Baumgartner, & Coplan, 2019). Since attitudes about a characteristic strongly influence (sometimes even subconsciously) our behavioural responses (Greenwald, Poehlman, Uhlmann & Banaji, 2009), there is an important need to further identify and clarify attitudes and beliefs about shyness.

Moreover, implicit attitudes also play an important role in predicting people's behaviours (Greenwald, McGhee, & Schwartz, 1998). Different from explicit attitudes, which are measured by self-report, implicit attitudes are usually activated without conscious awareness. It also appears that implicit attitudes can better capture many aspects of human thought that are not revealed by explicit attitudes (Greenwald et al., 1998). Implicit attitudes also tend to better predict individuals' behavior in socially sensitive domains, such as prejudices and stereotypes (Green et al., 2007). Thus, there is a need to identify peoples' implicit attitude toward shyness, which would help us better understanding peoples' behaviors.

It is also important to explore the role of culture in the development of explicit and implicit attitudes. For example, traditional Chinese culture is viewed as more collectivist, with social norms focusing on interdependence and maintaining harmony (Chen, 2019; Chen et al., 2005). As a result, in this context, social restraint is highly valued, and shy behaviours are perceived as socially mature. However, Chinese people have experienced a large cultural shift over the last 25 years, from more collectivistic, with social norms focusing on interdependence and maintaining harmony, to more individualistic, with social initiative and autonomy increasingly accepted and valued. As a result, it appears as though shyness has become less acceptable as a behavioural characteristic (Liu et al., 2015; Wu et al., 2015). Thus, there is also a need to identify Chinese peoples' both explicit and implicit attitude toward shyness.

Accordingly, the primary purpose of this dissertation was to explore explicit and implicit attitudes toward shyness in samples of university students from both Canada and mainland China. In addition, the role of participants' gender and personality (i.e., own shyness) were explored as well. To address these goals, four studies were conducted in order to address various research questions and gaps in the literature. Both explicit measure (questionnaire) and implicit measure (Implicit Association Test) were used to investigate attitudes toward shyness in both Canada and China. Study 1 directly compared explicit attitudes (normative beliefs) toward shyness in samples of Canadian and Chinese university students. In Study 2 and Study 3, a new implicit attitudes test (both in lab and online) related to shyness was developed and implemented in a sample of Canadian students. Finally, in Study 4, a similar protocol was developed and implemented to investigate Chinese students' implicit attitudes toward shyness. There

have been few previous studies assessing explicit attitudes toward shyness – and no previous studies of implicit attitudes. As such, this dissertation comprehensively and systematically examined attitudes toward shyness in two cultural contexts represents a novel and substantive contribution to the extant literature.

In the general introduction, the theoretical framework for the research is presented. In the first part, the concept of shyness is introduced, followed by a review of development and implications of shyness in Western and non-Western (China). Next, the concepts of attitudes and beliefs, beliefs about shyness in both countries, and relevant empirical research are presented. In Study 2, the concept of implicit attitudes is presented, including a discussion of implicit cognition and measurement issues. Interpretations, limitations, and future directions are reviewed following each study, with a General Discussion of the research provided at the end.

Definition and Conceptual Overview of Shyness

The construct of *shyness* spans multiple levels of investigation from differing perspectives, ranging from trait, to emotion, to cognition about the self and others, as well as across different cultural contexts (Stevenson-Hinde, 1989). Historical origins of the study of shyness can be traced back to the work of Darwin (1877) and Campbell (1896), who defined shyness as “excessive self-consciousness and excessive sensitiveness as to what others may think of the personality of the sufferer” (p. 806). The contemporary study of shyness still conceptualizes and defines this construct in a number of different ways. For example, at its most basic level, some researchers have argued that shyness can be viewed as a state (e.g., Crozier, 1999), whereas others have considered shyness as a personality trait (e.g., Cheek & Krasnoperova, 1999).

As a construct, shyness is particularly complicated to conceptualize because it is comprised of a number of different components, including emotions (e.g., fear, anxiety, embarrassment), cognitions (e.g., negative thoughts about the self, heightened perceptions of social threats), physiological responses (e.g., sweating, blushing, racing heart), and behaviours (e.g., gaze aversion, speech reticence, social withdrawal) (Henderson, Zimbardo & Carducci, 2010). Moreover, shyness can also be triggered by a wide variety of situational cues, including meeting unfamiliar people, encounters with persons of authority, interactions with potential romantic partners, having to talk in front of an audience, or even simply unstructured social settings (Henderson & Zimbardo, 2001).

From an *emotional* perspective, Buss (1980) defined shyness as feelings of tension, fear, awkwardness and discomfort in the presence of others. Buss (1985) further proposed a theory of shyness that specifies two types: fearful shyness and self-conscious shyness. *Fearful* shyness is thought to begin in early childhood, to be temperamentally based, and characterized by heightened physiological arousal (similar to behavioural inhibition; Kagan, 1999). It usually elicited by novel social situations and negative social interaction, such as peer rejection and exclusion. In contrast, *self-conscious* shyness is thought to arise later, does not involve fearfulness, but instead is related to excessive worry about social evaluation of public self (Eggum-Wilkens, Lemery-Chalfant, Aksan, & Goldsmith, 2015). Thus, this type of shyness is characterized by cognitive distress but involves little physiological arousal.

From a *personality* perspective, shyness is considered to be a trait characterized by the tendency to experience fear, anxiety, or feelings of awkwardness during social

interactions, especially with unfamiliar people (Cheek et al., 1986). Similarly, Melchoir and Cheek (1990) defined shyness as an anxious preoccupation of the self in response to real and/or imagined social, and as an early appearing and stable feature of personality. Most previous personality research focused on the broader the personality traits of introversion and neuroticism, neither of which captures the commonly understood meaning of shyness (Kagan & Reznick, 1986). Eysenck and Eysenck (1985) advocated a hierarchical theory model, with the highest level encompassing super-factors like introversion and neuroticism. The trait of shyness was considered to be a lower level construct, which is relatively *pure* and subsumed by super-factors. Previous studies support the notion that shyness is not equivalent to the constructs of neuroticism or introversion (Briggs, 1988), but might be the best represented as a primary factor situated between and contributing to both of these traits (Eysenck et al., 1985).

From a *motivational* perspective, shy individuals conceptualized as wanting to participate in social interaction and to make desired impressions on other people (i.e., high social approach motivation). However, shyness is also thought to lead to feelings of anxiety, fear, and discomfort during such interactions, as well as doubts about impression management, which can lead to the desire to avoid social situations (i.e., high social avoidance motivation). This has been described as an approach-avoidance conflict (Asendorpf, 1990; Coplan et al., 2004).

From a *psychopathological* perspective, shyness shares similar symptomatology with the clinical disorder of *Social Anxiety disorder* (SAD, also previously labelled as social phobia). As defined in the Diagnostic and Statistical Manual of Mental Disorders—Fifth Edition (DSM-IV) (2017), SAD includes somatic symptoms (trembling,

sweating), cognitive symptoms (e.g., fear of the negative evaluation) and behavioural symptoms (e.g., avoidance of social situations). SAD is a prevalent disorder with onset typically in late childhood (Ballenger et al., 1998; Beidel, 1998). Previous reports indicate that between 4% and 8% of adults in the general population suffer from SAD in a given year (Fehm, Beesdo, Jacobi, & Fiedler, 2008; Hettema, Neale & Kendler, 2001). Social anxiety disorder can interfere with personal, social, academic, and career development. For example, it can leave individuals socially isolated, unable to pursue intimate relationships and career fulfillment (Brunello et al., 2000).

There is continued debate as to the similarities and differences between shyness and social anxiety (Rapee & Coplan, 2010). However, many researchers consider shyness as differing from social anxiety disorder in several important ways (Turner et al., 1990). For example, shyness is considered a normal facet of personality, with almost 90% individuals reporting to have experienced shyness in their lives (Zimbardo, 1977). Among these populations, nearly 20% of people have stable shyness (Cheek & Melchior, 1990). Thus, as would be expected when differentiating between personality and disorder, the percentage of people considering themselves *shy* would be consistently higher than those meeting the criteria for social anxiety disorder (Burstein et al., 2011; Chavira et al., 2002; Costello et al., 2005; Ford et al., 1998; Heiser et al., 2003; Rapee et al., 2009; Zimbardo, 1977). Moreover, shyness is more transitory (Beidel & Turner, 1999; Bruch, Giordano, & Pearl, 1986), whereas social anxiety disorder is thought to be more chronic and unremitting (Turner & Beidel, 1989).

Notwithstanding, there remains considerable overlap at the level of measurement, as the items that typically assess of shyness and social anxiety disorder are often quite

similar, especially for items reflecting social fears (Rapee et al., 2010). For example, Brook and Willoughby (2019) evaluated ten questionnaires measuring either shyness or social anxiety disorder. Their results demonstrated that the constructs of shyness and social anxiety are not well differentiated from each other. In this regard, it has been argued that shyness and social anxiety disorder are part of the same continuum, with SAD representing the result of an extreme or clinical form of shyness (Chavira et al., 2002; Marshall & Lipsett, 1994; McNeil, 2001). However, shyness is more commonly conceptualized as a temperamental and/or personality *vulnerability* to social anxiety (Rapee et al., 2010).

Origins of Shyness

Role of biology. There is growing evidence to suggest biological bases for the development of shyness. For example, previous studies suggest a genetic contribution to the origins of shyness is the finding that approximately 15% to 20% of newborns show an inhibited temperament characterized by high reactivity (e.g., excessive crying) to novel stimulation (Stevenson-Hinde & Marshal, 2001). Twin studies also suggest that heredity is involved in the etiology of individual differences in shyness (Horn et al., 1976; Plomin, DeFries, & McClearn, 1980). For example, Morneau-Vaillancourt et al. (2019) examined the genetic and environmental contributions to shyness of 553 twin pairs. They found that stability in shyness is mostly accounted for by genetic contributions. Studies of molecular genetics have also revealed a significant association between shyness and the short allele of polymorphism in the serotonin transporter (5-HTTLPR) (Battaglia, Ogliari, Zanoni, Citterio, & Pozzoli, 2005).

Many of the studies in this area focus on the related construct of *behavioural inhibition* (BI), which refers to a temperamental trait characterized by fear, unease, and avoidance in novel situations (e.g., encountering new people) (Kagan, 1997). Shyness/BI is found to be related to a constellation of physiological reactions which imply greater arousal in some hypothalamic and limbic sites, especially the amygdala. Thus, shy individuals show more activity in biological systems such as sympathetic chain, reticular formation with its projections to skeletal muscles and so on (Kagan, Reznick, & Snidman, 1988).

From a more macroscopic level, results from a series of fMRI studies have found that shyness is associated with hyper-responsivity to social stimuli in the amygdala and frontal cortex (Beaton, Schmidt, Schulkin, Antony, & Swinson, 2008; Beaton, Schmidt, Schulkin, & Hall, 2010). For example, Schwartz et al. (2003) found shy young adults shows greater amygdalar activation in response to novel faces compare to non-shy individuals. Similarly, electrophysiological studies have shown that shyness is associated with the pattern of resting frontal electroencephalogram (EEG) (Jetha, Schmidt & Goldberg, 2009; Schmidt, 1999). These EEG studies have also demonstrated that the N2, N400 and other frontal negative ERP (Event-related potentials) amplitudes are enhanced during negative mood induction conditions, and among individuals reporting heightened levels of trait anxiety and internalizing symptoms (Henderson, 2010). Taken together, these studies indicate that shyness is associated with specific biomarkers of stress vulnerability and reactivity, which further proved the biological bases for the development of shyness.

Role of parents. Parenting is also considered an important factor affecting the development of child shyness (Rubin, Nelson, Hastings & Asendorpf, 1999). According to transactional models of development (e.g., Davidov & Grusec, 2006; Rubin, Hymel, Mills, & Rose-Krasnor, 1991; Sameroff & Mackenzie, 2003), there is a dynamic interplay over time among child characteristics (e.g., temperament) and features of the environment (e.g., relationships with important others, such as parents).

For example, shy children tend to respond to exposure to stressful social conditions with reactivity and emotional volatility (Kagan, Reznick, & Snidman, 1987). This may evoke parents to perceive their shy children as vulnerable and increase their likelihood of responding with over-protection and/or over-control (Coplan et al., 2008; Coplan, Reichel, & Rowan, 2009; Kiel, & Buss, 2012; Rubin et al., 2002). In turn, these parenting behaviours may serve to reinforce shy child's anxiety and fearfulness (Mills & Rubin, 1993). Taken together, parents also play an important role in affecting the development of child shyness.

Development and Implications of Shyness in Western Cultures

Childhood and adolescence. Historically, the majority of research into the development and implications of shyness has been conducted in Western cultures. Overall, there is accumulating and converging evidence to indicate that shyness in childhood is concurrently and predictively associated with a wide range of negative adjustment outcomes, including peer difficulties (e.g., victimization and rejection), internalizing problems (e.g., symptoms of anxiety and depression), and academic challenges (Arbeau, Coplan, & Weeks, 2010; Crozier, 1995; Karevold, Ystrøm, Coplan, Sanson, & Mathiesen, 2012; Ladd, Kochenderfer-Ladd, Eggum, Kochel, & McConnell,

2011; Spangler & Gazelle, 2009). From a developmental perspective, childhood shyness may be viewed as problematic because shy, quiet, and submissive behaviours violate positively-valued Western traits pertaining to sociability, assertiveness, and individualism (Chen & French, 2008). Indeed, the primary goals of many intervention programs for inhibited and withdrawn children are to increase both the quality and frequency social interactions with peers (Greco & Morris, 2001).

There is no doubt that peers play an important role in children's lives and in their overall development. In early childhood, children learn a lot from their relations with peers, such as communication skills (e.g., how to invite other children to play), cooperation skills, social norms, emotion regulation skills (e.g., sad, angry) and so on (Ladd, 1999; Rubin & Ross, 2012; Spinrad et al., 2004). However, shyness is related to difficulties in social relationships (e.g., peer exclusion, victimization) and peer dislike (Bohlin et al., 2005). For example, Phillipsen, Bridges, McLemore, and Saponaro (1999) found a significant negative relation between shyness and teacher ratings of peer acceptance.

Researchers have proposed several potential reasons why shy children tend to evoke more negative responses and are less accepted by peers. One possible reason is that shy children have poor social skills (e.g., Bohlin, Hagekull, & Andersson, 2005; Coplan et al., 2004; Coplan et al., 2008). Feeling of social wariness and self-consciousness may cause shy children to withdraw from opportunities to make friends and interact socially (Coplan, DeBow, Schneider, & Graham, 2009; Coplan et al., 2004). As a result, they may miss out on important opportunities to practice and develop new cognitive and social

skills (Jones et al., 2015), which in turn might lead to deficits in communicative competence.

For example, researchers found that shy children usually unable to cope with or regulate their negative emotions, they prefer to select avoidant coping mechanism, such as a retreat to solitary activity (Asendorpf, 1991) or avoidant coping (Eisenberg et al., 1998). These poor social skills contribute toward speaking less during conversations, responding slowly to conversation partners, and allowing long silences, which inhibits relationships (Leary & Buckley, 2000). Furthermore, during the opportunities for peer interaction, shy children tend to display reticent behaviour, such as watching but not joining in or remove themselves from per contact (Coplan et al., 2004; Coplan, Rubin, Fox, Calkins, & Stewart, 1994) And these quiet, less talkative children are perceived as less approachable, less socially competent, and unfriendly by peers (Evans, 1993).

Shy children are also more vulnerable to the development of internalizing problems, such as anxiety, depression, and loneliness (Coplan et al., 2004; Sette, Zava, Baumgartner, Baiocco, & Coplan, 2016) found that shyness was positively related to internalizing problems. Shy children may also develop more negative self-perceptions when they experience difficulties in social situations (e.g., Rubin et al., 1995). This negative self-perception could lead to lower level of self-esteem and symptoms of depression over the longer term. For example, Karevold et al. (2011) found that shyness during infancy and early childhood was a significant predictor of internalizing problems at age 8.5 years. Karevold et al. (2012) further reported that preschoolers' shyness predicted anxiety symptoms and poorer social skills at ages 12–13 years. Indeed, shyness

in childhood is considered to be one of the strongest predictors of later clinical anxiety disorders, particularly social anxiety (Clauss & Blackford, 2012).

Internalizing problems such as social anxiety may be particularly detrimental to social interaction, as anxious feelings and intrusive thoughts can interfere with task-focused attention, and thereby disrupt task performance (Rapee & Heimberg, 1997). Thus, feelings of social anxiety may inhibit positive social interactions and reduce social opportunities, further contributing to problems in interpersonal relations (Davila et al., 2008; La Greca, 2001). For example, shy children may feel anxious and inhibited around peers and thus engage in fewer positive and more negative interactions with friends, which in turn might lead to less acceptance by peers (Storch et al., 2005).

At school, shy children continue to be viewed as less competent and engaged by teachers and peers and are easily to experience academic challenges (Asendorpf & Meier, 1993; Evans, 1987). Shy children also tend to have lower academic achievement (Hughes & Coplan, 2010; Masten et al., 2010). There are several reasons that might explain the link between shyness and academic performance. For example, school is particularly stressful for shy children (Coplan & Arbeau, 2008) and they are more likely to experience school adjustment difficulties and negative teacher-child relationships (Rydell, Bohlin, & Thorell, 2005). This stressful climate might have a great influence on the academic achievement of shy children. Shy children also participate less in classroom discussions and activities (Asendorpf et al., 1993), leading them to being perceived as having underdevelopment academic skills (Coplan et al., 2011).

Emerging adulthood. *Emerging adulthood* (Arnett, 2004) is described as a life stage between adolescence and adulthood (lasting roughly from ages 18 to 25 years).

Emerging adults may perceive themselves as being “in between” (i.e., as neither adolescents nor adults). This is also a time of significant identity exploration (especially in relationships and world views), a greater focus on the self, and considerable instability (e.g., changes of relationships, work, and education). This developmental period may represent a particularly stressful time for shy individuals because of increased demands for social interaction in the context of these major life changes (Nelson, 2013).

Shyness among emerging adults is associated with negative self-perceptions (self-worth, social acceptance, physical appearance; Nelson et al., 2008) as well as feeling of discomfort or inhibition during interpersonal interactions (Henderson & Zimbardo, 1998). These characteristics continue to make it difficult for shy emerging adults to effectively communicate with others to function optimally in social environments. For example, compared to more sociable individuals, shy people have a harder time initiating and continuing conversations (Pilkonis, 1977), speak less, and take a longer time to respond during conversations (Leary & Kowalski, 1995). Feeling of anxiety and nervousness may also make shy individuals feel less comfortable making jokes and displaying amusing behaviours (Basak & Can, 2014). Thus, shy young adults are more often viewed by others as unfriendly and less relaxed (Pilkonis, 1977). Longitudinal research has also indicated that shyness in childhood predicts later adjustment problems in a variety of areas such as educational attainment, career stability, and mental health (e.g., Caspi et al., 1988; Rubin et al., 1995).

Perhaps because of negative expectations and fear of negative evaluations, shy individuals also tend to be less satisfied with, and have more difficulties maintaining, friendships and romantic relationships (Baker & McNulty, 2010). According to

interdependence theory (Thibaut & Kelley, 1959), and supported by recent empirical work (e.g., McNulty, O'Mara, & Karney, 2008), maintaining a satisfying intimate relationship requires emotion regulation skills and minimizing costs by solving problems. However, shy young adults may be particularly ineffective in problem solving and have poorer emotion regulation skills. For example, researchers found that shy adults' relationships with family and friends tend to be characterized by lower levels of quality (Arroyo & Harwood, 2010; Nelson et al., 2008).

As well, shyness remains a significant correlate of anxiety and other internalizing problems during this age period (Tackett, Nelson, & Busby, 2013). Emerging adults are faced with increased demands to structure their environments in terms of formation of relationships and identity (Arnett, 2000; Gest, 1997). Shy individuals may experience greater difficulty than non-shy individuals in psychosocial adjustment (e.g., Jackson & Ebnet, 2006). In one study of undergraduates, extreme shyness was associated with socioemotional difficulties such as loneliness, depression, and social anxiety (Schmidt & Fox, 1996). Similarly, Mounts, Valentiner, Anderson and Boswell (2006) found that high levels of shyness were related to anxiety and depression in college students. Nelson et al. (2008) also reported that, as compared to their more sociable peers, shy emerging adults reported being more anxious and depressed, having lower levels of self-esteem and self-perceptions of their social acceptance, and experiencing poorer relationship quality with parents, best friends, and romantic partners.

In adulthood, shyness also becomes increasingly associated with alcohol use, often as a coping mechanism to reduce social unease (Hamer & Bruch, 1997). As well, results from previous studies suggest that as compared to the sociable individuals, shy adults are

more likely to experience delays in their social roles, such as marriage, birth of the first child and establish careers (Caspi, Elder, & Bem, 1988). For example, Asendorpf (2000) found that compared to the sociable individuals, shy people built their social network slower. And the relationships they had were less supportive and friendly. Taken together, across the lifespan, shyness is associated with a wide range of maladaptive adjustment outcomes.

Development and Implications of Shyness in China

The meaning and implications of shyness also appears to be deeply affected by social and cultural context (Chen et al., 2008). Researchers have argued that peers and adults in different societies or communities may evaluate and respond to specific socioemotional characteristics differently, and express different attitudes toward children who display these characteristics in social interactions (Chao, 1994; Chen, 2018; Chen et al., 2008). These social evaluations and attitudes provide a basis for the judgment of social competence and determine social evaluation.

Traditional Chinese culture is viewed as more collectivist, with social norms focusing on interdependence and maintaining harmony (Chen et al., 2005). As a result, social restraint is highly valued, and shy, quiet, and modest behaviours are perceived as socially mature. However, rapid and ongoing changes in China over the last 25 years appear to have resulted in drastic changes in the societal value placed upon shy behaviours in this cultural context (Chen et al., 2005). In the following sections, an overview of the meaning and implications of shyness in China is provided.

Historical studies. Most of what we know about the nature and implications of childhood shyness is based on research conducted in Western cultures (Rubin et al.,

2009). The earliest studies of shyness in China were conducted in the 1990s. In contrast to findings previously described with children from Western cultures, results from a series of studies indicated that shy, anxious, and sensitive behaviour in China was found to be *adaptive* and associated with *positive* outcomes, including positive peer relationships, school competence, and psychological well-being (e.g., Chen, Dong & Zhou, 1997; Chen et al., 1995; Chen et al., 1992). For example, Chen, Rubin, and Sun (1992) found that, shyness was positively associated with sociability-leadership and with peer acceptance in a sample of Chinese elementary school children.

These strikingly different findings were accounted for by cultural differences in the social environment. As mentioned before, Chinese culture is a collectivist culture with unique social norms (e.g., focus on interdependence with each other), and maintaining harmony is the main concern of individuals in the collectivist society (Chen, Chen, Li, & Wang, 2009). Accordingly, cautious individuals tend to be considered as more mature in Confucian society and social restraint is highly valued. As a result, shy behaviours are perceived as socially mature (Chen et al., 1998) and obtain social approval and support (Ho, 1986). Given the positive evaluation of shy behaviour in Chinese culture, one might predict that shy children would not be considered socially immature or maladjusted by others. Moreover, Chen (2010) has argued that shy children thrived in traditional Chinese culture because of the positive support they received from parents, teachers, and peers.

Contemporary studies. Over the last 25 years, Chinese society has transitioned from a traditional hierarchical society to one where social initiative and autonomy is increasingly accepted and valued (Chen et al., 2005). The large-scale market-oriented economic reforms led to the substantive social changes. For example, as social

assertiveness and competitiveness are increasingly required in contemporary Chinese society (Xu & Peng, 2001; Yu, 2002), it has been speculated shyness might be associated with social, school and psychological adjustment differently in modern China (Chen et al., 2005). Urban China became a more competitive market-oriented society, assertiveness and self-expression are tends to be more beneficial to adaptation and success in the working and school environment due to the new cultural norms (Chen et al., 2014).

Since shyness may become incompatible with the social requirements and is no longer an adaptive trait in such society (Chen, Wang, & DeSouza, 2006), people's attitudes about shyness appear to have changed as well. Indeed, results from several recent studies have provided support for the notion that shyness is now associated with negative outcomes in contemporary China (e.g., Coplan et al., 2016; Ding et al., 2014; Liu et al., 2015; Wu et al., 2015). For example, a recent study has found that children's shyness was associated greater internalizing problems, poorer academic achievement, and less peer preference (Coplan, Liu, Cao, Chen, & Li, 2017). Similarly, Liu, Coplan, Chen, Li, Ding, and Zhou (2014) examined the short-term longitudinal associations between shyness and adjustment outcomes among Chinese children. Their results indicated that children's shyness was significantly and negatively related to peer preference, self-perceptions and academic achievements and positively related to the indices of maladjustment at both time points. Liu et al. (2017) also recently reported that shyness was related to adjustment problems in children and adolescents and it tended to be associated with social and psychological problems more strongly in adolescence in China.

Furthermore, there is growing evidence that peers now respond more negatively to child shyness in China. For example, Liu et al., (2014) examined the short-term longitudinal associations between shyness and peer relations among Chinese children. Results indicated that children's shyness was significantly and negatively predictive of peer preference. Ding et al. (2014) found positive associations between self-reported shyness and peer-nominations of dislike and victimization in a late-childhood urban Chinese sample. As well, Zhang and Eggum-Wilkens (2018) reported that shyness was positively associated with perceived peer exclusion in a sample of Chinese early adolescents. Perhaps most striking, Liu et al. (2015) examined cross-cultural invariance across a large sample of Chinese and Canadian children and found that shyness was similarly negatively associated with peer preference. Thus, there appears to be converging evidence to suggest that peers in urban Chinese contexts are no longer providing consistent positive support to shy children.

These studies have indicated that people more hold negative attitudes toward shy behaviours in contemporary Chinese society. It may be that without the support from parents, teachers, and peers, shy individuals are now having a much more difficult time succeeding socially and academically (Liu, Xiao, Coplan, Chen, & Li, 2018). However, a review of the literature revealed only two previous studies examining correlates and consequences of shyness during emerging adulthood in contemporary China. Nelson, Lee, and Duan (2015) reported associations among shyness and indices of internalizing problems in Chinese young people. Similarly, Zhang et al. (2018) reported that shyness in young Chinese adults was associated with lower self-efficacy for peer interactions and higher perceived exclusion.

Interestingly, there appear to be some differences in these findings as a function of geographical location in China. For example, despite the ongoing changes, families in *rural* areas in China still live mostly agricultural lives and do not have as much exposure as urban children to the influence of the social change (Huang & Du, 2007). Thus, it has been argued that in more rural areas, traditionally endorsed behaviours such as shyness are still highly emphasized (Ying & Zhang, 1995; Ming, 2008). In support of this notion, parents of urban adolescents have reported more encouragement of independence and social initiative than parents of rural adolescents (Chen, Bian, Xin, Wang, & Silbereisen, 2010; Chen & Li, 2012). Similarly, it has been found that rural individuals are more likely to display group orientation and self-control and are less likely to pursue individual interests (Guo, Yao, & Yang, 2005; Wang, 2003). Urban adolescents also have shown better understanding of Western values (e.g., individuality) than their rural peers, and thus may be more susceptible to influences of Western cultures (Chen & Chiu, 2010).

Chen, Wang, and Cao (2011) directly compared the relations between shyness and adjustment outcomes in rural and urban China. According to their results, shyness in rural areas was associated with indexes of social and psychological *adjustment*, including peer acceptance, teacher-rated competence, academic achievement, and emotional well-being. In contrast, shy adolescents appear to perceive more peer exclusion in urban contexts (Zhang et al., 2018). It may be that social behaviours continue to be evaluated, to a large extent, according to the traditional standards in rural China.

To summarize, shyness in Western cultures and contemporary China is concurrently and predictively associated with a number of maladaptive adjustment outcomes, including internalizing problems and difficulties with relationships. However, to date,

relatively little is known about general attitudes and beliefs about shyness. Accordingly, the primary goal of Study 1 was to directly assess and compare normative beliefs about shyness in Canadian sample and Chinese emerging adults.

Study 1:

Normative Beliefs about Shyness in Canadian and Chinese Emerging Adults

Attitudes play an important role in predicting our behaviours (Fabrigar et al., 2005). It is widely accepted that human behaviour is guided by social attitudes (Greenwald et al., 2009). Indeed, the field of social psychology was originally defined as the scientific study of attitudes (Thomas & Znaniecki, 1918; Watson, 1925) because it was assumed that attitudes were the key to understanding human behaviour. For example, individuals' beliefs influence the decisions they make (e.g., Fang, 1996; Vartuli, 1999) and their responses to other's behaviours (e.g., Abelson, 1979; Cunningham & Sugawara, 1988).

Researchers have proposed two theoretical perspectives about how attitudes might influence individuals' cognitions, perceptions, and behaviours. The first assumes that attitudes might influence people's behaviour *directly*, for example when a certain object activates an attitude from memory (Fazio, Powell, & Kardes, 1986; Kallgren & Wood, 1986). Such memories are also based on direct experiences (Cacioppo, Petty, Kao, & Rodriguez, 1986; Regan & Fazio, 1977). Researchers also argued that this direct experience would further induce individuals to think about their attitudes. In turn, this cognition would increase the frequent availability of attitudes as a basis for future behaviours (Petty, Haugtvedt, & Smith, 1995).

An alternative approach proposes that attitudes can be reconstructed at all times (Horenczyk, 1997). More specifically, an object would reconstruct individuals' attitudes when the information provided is inconsistent (Erber, Hodges, & Wilson, 1995). Moreover, if all the information people have about an object is one-side (positive or

negative), their attitudes toward such object should be more stable (Ajzen, 1996), which in turn, will better predict people's behaviours (Erber et al., 1995). In contrast, attitudes can be changed when information is inconsistent. In support of this notion, investigators have assessed verbal attitudes and observed the expected relations to actual behaviours (Ajzen, 1996; Doll & Ajzen, 1992; Krosnick et al., 2005; Schwarz, 2008). For example, Doll and Ajzen (1992) measured people's attitude to video game, they gave participants' direct or indirect experience with six video games and also different instructions (fun or skill). The results showed that direct experiences and fun instructions changed people's attitudes to the video games and improved prediction of behavior (the choice of continue playing).

Attitude *objects* can be anything that individuals hold in their mind, ranging from the mundane to the abstract, such as, different social groups, people or ideas (Bohner & Dickel, 2011). However, there are only a few studies that have directly explored explicit attitudes toward shyness. Most of these studies assessed parents' and teachers' attitudes toward young children (e.g., Arbeau & Coplan, 2007; Kingsbury & Coplan, 2012). As such, there remains a need to identify and clarify more general attitudes (i.e., normative beliefs) about shy behaviours.

Normative beliefs are defined as individualistic cognitive standards about the acceptability of certain behaviors (Huesmann & Guerra, 1997). These beliefs serve to regulate individuals' reactions and behaviors by prescribing the range of allowable and prohibited behaviors (Guerra, Huesmann, & Hanish, 1994). Some researchers have argued that individuals' normative beliefs may or may not be consistent with prevailing social norms, but are nevertheless affected by peers, social groups, and environment

(Huesmann, Guerra, Miller, & Zelli, 1992). The primary goal of Study 1 was to explore normative beliefs about shyness.

Attitudes and Beliefs about Shyness

One way that attitudes about shyness (and related behaviours) have been previously considered is as a component of the social anxiety cognition model (Leary, Kowalski, & Campbell, 1988). When shy and socially anxious individuals meet new people or enter a social interaction, they tend to assume that their interaction partner will perceive them negatively (Cole & McCroskey, 2003; Papee & Heimberg, 1997). Such negative reactions from others will, in turn, contribute to increased feelings of social anxiety. However, in such cases, it is the individuals' *perceptions* of being treated negatively that is the driving mechanism. Notwithstanding, there is also evidence that negative stereotypes about shyness can also promote negative (e.g., unfriendly) feedback to individuals who display signs of social anxiety (Schoroeder & Ketrow, 1997).

In recent years, researchers have also begun to more directly explore how shyness is perceived and understood. Most of this work has been done in non-Western cultures. This is particularly important because cultural beliefs and values can shape the environment in which individuals' behavioural are accepted and understood (Farver, 1999). As such, the perception and expression of shyness can be expected to vary in relation to a culture's values and socialization goals. As Pines and Zimbardo (1978) suggest, cultural differences in the relative advantage or disadvantage of shy behaviours may be the result of the different ways shyness is perceived.

For example, Xu and colleagues (2009) proposed a culturally-specific type of shyness that they labelled as *regulated* shyness. This term refers to self-controlled

behaviours, modesty, and social restraint. Xu et al. (2009) suggested that this specific type of shyness remains consistent with cultural values in China that promote the maintenance of social harmony (Wu, 1996). In support of this notion, regulated shyness was found to be associated with higher social preference and lower loneliness and anxiety (Xu et al., 2009). Furthermore, regulated shy children do not avoid social interaction but tend to behave in a nonassertive and unassuming fashion when interacting with peers (Xu & Farver, 2009; Xu, Farver, Chang, Zhang, & Yu, 2007). Thus, this particular type of shyness might be viewed differently. In the following sections, studies related to attitudes about shyness from the perspective of parents, teachers, and peers are reviewed.

Parents. Developmental researchers acknowledge the important role of parental cognitions and emotions in children's social development (Hastings & Rubin, 1999). Parents' responses to children's displays of social behaviours can be interpreted as indicative of their beliefs about the putative value and acceptability of these behaviours (Cheah & Rubin, 2004; Evans, Nelson, Porter, Nelson, & Hart, 2012; Mills et al., 1993). Consistent with the notion that shyness is negatively valued in the West, there is converging evidence to suggest that child shyness invokes negative parental emotional and behavioural reactions (e.g., Hastings et al., 1999; Kingsbury et al., 2012; Rubin, Nelson et al., 1991).

There have been fewer studies of parental attitudes about shyness in China. Cheah et al., (2004) examined parenting beliefs among mothers of preschool-aged children in both the United States and Mainland China. They found that mothers in both countries regarded socially withdrawn behaviours in their children negatively. In another study, and Farver (2005) conducted informal interviews with Mainland Chinese mothers about

their perceptions of regulated shyness. They reported that the term *hai xiu* (shyness) was also used to describe children who do not brag about their good grades and those who back off when facing potential conflict with peers. Such behaviours seem to be associated with the need to maintain harmonious social interactions. It might indicate parents' hold positive attitude to regulated shyness.

Teachers. Researchers have also examined teachers' attitudes about students' shy behaviour (see Archbell, Bullock, & Coplan, 2019, for a recent review). Teachers' attitudes, reactions, and responses to children's social behaviours at school can also be interpreted as reflecting broader views about the adaptability of different characteristics (Coplan, Bullock, Archbell, & Bosacki, 2015; Thijs, Koomen, & Van der Leij, 2006).

In earlier years, researchers have argued that shy children might more liked by their teachers because they maintain the order in the classroom (Rubin, 1982). Other has argued that shy students are "invisible" (i.e., do not draw much attention from teachers) (Rudasill & Rimm-Kaufman, 2009; Rimm, Kaufman, & Kagan, 2005). However, there is growing recent evidence to suggest that shyness is now perceived as problematic by teachers (Coplan et al., 2008; Coplan & Prakash, 2003; Coplan et al., 2011; Coplan et al., 2015; Thijs et al., 2006). For example, Arbeau et al., (2007) found that kindergarten teachers were just as likely to predict that shy children would be at risk for future social difficulties as aggressive children, suggesting that teachers perceive shyness as a serious behaviour problem in early childhood classrooms.

There have only been limited previous studies of teachers' attitudes toward child shyness in China (e.g., Zhang & Nurmi, 2012; Zhang & Sun, 2011). There is at least some evidence to suggest that Chinese teachers do now perceive shyness as potentially

problematic behaviour in the classroom (Li et al., 2016). For example, Xu et al., (2007) reported that some of Chinese teachers' descriptions of shy children (e.g., "afraid to play with others", "timid and fearful") appeared to reflect more negative attitudes. However, in this study, teachers also described shy children in terms of more positive behaviours ("behaves modestly" or "avoid conflict with peers") might indicate more positive attitudes toward shy behaviour.

This raises an important issue for research related to shyness in China. When the word *shyness* is mentioned, do people think of more *anxious* shyness or *regulated* shyness? Does the use of different words (in Mandarin) affect beliefs and attitudes? These issues are to be explored more specifically in Study 4.

Peers. Finally, researchers have also peers' attitudes and beliefs about shyness at different developmental stages. Children's perceptions of shy peers can affect their social responses (e.g., accept or reject child friends) (Hymel, 1986; Ladd & Mars, 1986). Of note, children appear to have a fairly sophisticated understanding of the difference between socially withdrawn behaviours (i.e., playing alone) motivated by fear and anxiety (i.e., shyness) versus a non-fearful preference for solitary activities (i.e., unsociability) (e.g., Coplan, Girardi, Findlay, & Frohlick, 2007). For example, Coplan, Zheng, Weeks, and Chen (2012) explored young children's responses to hypothetical shy, unsociable, and socially competent peers in China and Canada. They found that compared to socially competent children, both Chinese and Canadian children reported less wanting to befriend with shy peers. Subsequently, Ding, Coplan, Sang, Liu, Pan, and Cheng (2015) further examined young Chinese children's beliefs about the implications of shyness, unsociability, and (for the first time) social avoidance (i.e., not desiring and

overtly avoiding opportunities for social interaction). Results showed that shyness was considered less intentionally (i.e., ‘act this way on purpose’) and Chinese children are more likely to predict that shy children accepting the invitation to join a social activity.

To date, a review of the literature revealed only two studies that have examined attitudes about shy behaviours in samples of young adults. Rapee and colleagues (2011) compared perceptions of withdrawn/shy and socially outgoing/confident peers among university students in Western and non-Western culture. Compared to the non-Western culture, shy peers were rated as less likeable and as having weaker career prospects than sociable peers in Western culture. Similarly, Bowker, Ojo, and Bowker (2016) found that, compared to sociable peers, shy peers were perceived to have lower social standing and easily evoked sympathy in a sample of Nigerian emerging adults.

Internal Moderators of Attitudes toward Shyness

Apart from considering the moderating role of culture individual’s attitudes about shyness, two other “internal” variables were also considered: gender and personality.

Role of gender. It is important to note that there are gender differences related to the implications of shyness in childhood and adolescence (Doey, Coplan, & Kingsbury, 2014). Participants’ gender might influence their beliefs about others’ shy behaviour. According to the gender role stereotype theory, males are traditionally perceived as more dominant and females as more passive in Western culture (Browne, 1998). Thus, it has been suggested that shyness might be more acceptable for girls than for boys because of the gender-stereotypes (Rubin & Coplan, 2004).

Previous studies provide some evidence to support that compared to shy boys, shy girls are more likely to be accepted by teachers, parents or peers (e.g., Birnbaum & Croll,

1984; Coplan et al., 2004; Eggum et al., 2009; DuPaul et al., 2006; Stipek & Miles, 2008). For example, Garside and Klimes-Dougan (2002) found that fathers tended to reward girls for expressing sadness and fear, but punished boys for expressing the same emotions. Kingsbury et al., (2012) also reported that parents' gender role attitudes might moderate their responses to shyness in boys versus girls. Similarly, compared to the shy girls, shy boy has been found to be more strongly associated with peer exclusion and rejection (Coplan et al., 2004, 2008; Spangler & Gazelle, 2009).

Interestingly, such gender differences have not typically been reported in samples of teachers (Arbeau et al., 2007; Arbeau et al., 2010; Coplan et al., 2011). As an explanation, researchers argued that teacher training and experiences might come to override gender stereotypes regarding shyness (Coplan et al., 2011).

Role of personality. Another factor that might affect peoples' normative beliefs about shyness is their own personality. According to the *Cognitive Dissonance Theory* (Festinger, 1957), when people's beliefs and opinions are inconsistent, discomfort will arise and produce pressure to reduce or eliminate the dissonance. Thus, individuals will make efforts to align their attitudes/beliefs and behaviors to avoid cognitive dissonance (Festinger, 1957). In this regard, shy individuals may be especially likely to be more accepting of others' shy behaviors, which is similar to their own (e.g., *shared* motivations). In indirect support of this notion, Coplan, Hughes, Bosacki, and Rose-Krasnor (2011) found that shy teachers perceived shy children's behaviour less negatively than did non-shy teachers. Therefore, it can be speculated that as compared with people who are more outgoing, shy individuals might be more empathetic toward

shy behavior and thus would perhaps respond more positively and hold more positive beliefs toward shyness.

Study 1: Goals, Research Questions, and Hypotheses

A review of the literature did not reveal any previous studies that have specifically explored *normative beliefs* about shyness (Bowker, Ooi, Coplan, & Etkin, 2019). Thus, it remains unclear to what extent (or even whether) shyness is viewed negatively by individuals. Moreover, despite changes in the correlates and outcomes of childhood shyness (that are interpreted as representing a change in normative beliefs), there have been no studies directly assessing attitudes about shyness in contemporary Chinese society.

Accordingly, the primary goal of Study 1 was to explore differences in normative beliefs about shyness among university students in Canada and China. Drawing upon the extant literature, it was predicted that shyness would be viewed more negatively, overall, in Canada as compared to China. Despite the ongoing changes in Chinese society, it was postulated that explicit attitudes toward shyness would still be somewhat influenced by traditional cultural values.

Gender was also expected to play a role. Overall, female participants (in both cultures) were expected to report more positive beliefs about shyness than males. Finally, shy participants in both cultures were also expected to report more positive beliefs about shy behavior than non-shy participants.

Study 1- Method

Participants and Procedure

Participants were $N = 1417$ undergraduate students enrolled in introductory psychology courses at public universities in the Shanghai, People Republic of China (394 males; $N = 850$, $M_{\text{age}} = 18.83$ years, $SD = .92$) and Ontario, Canada (226 males; $N = 567$, $M_{\text{age}} = 19.7$ years, $SD = 2.14$). Study procedures were approved by the university Institutional Review Boards. Upon obtaining consent, participants were asked to complete self-report measures administered via online survey websites. Participants were received course credit for participation.

Measures

Demographic information. Participants were asked to provide basic demographic information (e.g., gender, age) (see Appendix A).

Normative beliefs about shyness. Participants completed the 12-item *Normative Beliefs about Social Withdrawal Scale* (NOBSWS, Bowker et al., 2019), which was adapted from the *Normative Beliefs about Aggression Scale* (Huesmann et al., 1997). Huesmann et al., (1997) measured children's normative beliefs about aggression using the revised normative beliefs scale. The items were rephrased to describe the acceptability aggressive behaviour (35 items, e.g., "It's okay for a boy, Tom, to hit a girl, Julie, if Julie says something bad to Tom first"). Participants rate the acceptability of each behavior on a 4-point Likert scale. They found that it is reliable and valid for use with children, and it can predict children's subsequent aggressive behavior.

Items of NOBSWS were rephrased to describe the acceptability withdrawn behavior that varied according to underlying motivations (i.e., shy, unsociable, and avoidant) and actor gender (i.e., male, female). Of particular interest for the present study

was the subscale assessing participant shyness (6 items, e.g. “Suppose John wants to hang out with other people, but is sometimes too nervous. Do you think it’s OK for John to just watch others hang out?”). Each pair of descriptors varies in its depiction of the gender of the actor, for example, one depicts a man (indicated by the common names for men in Western country of John, Phillip, or Matt) displaying shy behavior whereas the other depicts a woman (indicated by the common names for women of Mary, Becca, or Zoe). Participants rate the acceptability of each behavior on a 4-point Likert scale ranging from 1 (It’s really wrong) to 4 (It’s perfectly okay). To eliminate response biases, half the items were worded positively (with “OK”) and half were worded negatively (with “WRONG”). Items worded both positively and negatively to eliminate response biases. It has sound psychometric properties in western culture (e.g., Cronbach’s $\alpha = .78$, eigenvalue = 2.39, 59.78% of the variance; all factor loadings $> .63$, Bowker et al., 2019). And the items were translated into Mandarin and back-translated in English, with discrepancies between versions resolved by an expert panel. Factor and reliability analysis are presented in the Results section (see Appendix B and Appendix I).

Participant shyness. The *Revised Cheek and Buss Shyness Scale* (RCBS; Cheek, 1983) is a 18-item measure of shyness that uses a 5-point Likert scale to measure the extent to which the respondent feels that each item is characteristic of them (1 = “Very uncharacteristic” to 5 = “Very characteristic”). The RCBS was selected as it is one of the most widely used measures of shyness, and it can be completed in a short amount of time. It also has sound psychometric properties: An evaluation of the RCBS found it to have strong internal consistency ($\alpha = .86$) and test–retest reliability ($r = .88$), as well as good convergent and discriminant validity (Hopko, Stowell, Jones, Armento, & Cheek,

2005). Items were translated into Mandarin and back-translated in English, with discrepancies between versions resolved by an expert panel. This measure has previously demonstrated evidence of reliability and validity in China (Liu, Ooi, Xiao, Coplan, & Bowker, 2019, under review) (see Appendix C).

Overview of Data Analyses

Preliminary analyses. Data were screened for potential errors in data entry and then examined for missing values. Examination of the data for univariate and multivariate outliers was conducted, followed by testing of assumptions, multicollinearity, and normality.

Factor analyses. The *Normative Beliefs about Social Withdrawal Scale* (NOBSWS, Bowker et al., 2019) has not previously been used before in China. Accordingly, an Exploratory Factor Analysis (EFA) was used to explore the factor structure. Moreover, the factor structure and the invariance across samples were assessed. Specifically, a Confirmatory Factor Analysis (CFA) was used to establish the baseline model for further measurement invariance analyses. Next, multi-group CFA was used to assess the measurement invariance of the best-fitting baseline model across and between two culture groups. Four models were tested: configural invariance (constraining the factor pattern to be fixed across two groups); metric invariance (constraining equality of factor loadings across two groups); scalar invariance (constraining items intercepts to be fixed across groups); at last, strict invariance (constraining residuals to be fixed across groups). Each form of invariance was nested in the previous model and involved adding constraints at each step that built on previous constraints.

ANCOVA. To test the primary hypotheses, a two-way ANCOVA was conducted to test for gender differences, country, their own shyness in participants' normative belief about shyness. Levene's test and normality checks were carried out and the assumptions met.

Study 1 – Results

Preliminary analyses of other variables

Missing data. For all the variables, missing data rates ranging from 0.7 % to 2.6 %. Little's (1988) MCAR test was not significant, $\chi^2 (1226) = 1204, p = .06$, suggesting that the pattern of missingness was not systematic.

Outliers. A combination of different procedures was used to detect outliers. First, box plots were used. Box plots present the median, quartiles, and extreme values of the distribution of the variable. Moreover, according to Stevens (2002), the variables were *z*-transformed, and the cases with *z*-value > 3 are considered as outliers. Using this criteria, 19 cases were identified as potential outliers.

Mahalanobis distance values were then examined in order to identify potential multivariate outliers in the dataset. Mahalanobis distance values greater than the corresponding critical χ^2 value (at $p < .001$) were identified as potential multivariate outliers. Two cases were identified as potential multivariate outliers. Alteration or removal of such cases is generally not recommended, as they may be a true representation of the phenomenon being studied and are not likely to influence results when sample sizes are large. Indeed, deleting these cases did not significantly alter the pattern of results and, as such, these cases were retained.

Testing of assumptions. Assumptions of normality, linearity, and homoscedasticity was tested in the data. Examination of normal probability plots did not indicate any substantive departure from normality. However, several variables in the dataset met the criteria for being significantly skewed (i.e., z -scores > 1.96). However, this is expected in large (i.e., > 300) samples, and it is therefore recommended to rely on histograms and absolute values of skewness, rather than relying on z -scores (Kim, 2013). Examination of histograms suggested that all continuous variables had reasonably distinct tails and, as such, would likely not be dramatically improved by transformations. Moreover, none of the main study variables exceeded reference skew values (i.e., > 2) indicating substantial non-normality (range: $-.015$ - 1.59). More importantly, some degree of non-normality was expected due the nature of the constructs being explored. Accordingly, transformations of the data were not conducted as it has been argued that transforming an inherently non-normal variable to force a normal distribution may have adverse implications (Kline, 2016).

Matrix Scatter plot is run to check the bivariate plot for departures from linearity. As well, the standardized residual plot is computed to check the heteroscedasticity. Bivariate scatterplots of all predictor and outcome variables were examined to identify potential non-linear (i.e., quadratic) associations. No obvious curvature was apparent in all cases. Finally, plots of residual versus predicted values gave no major indication of heteroscedasticity, suggesting constancy of variance (i.e., homoscedasticity).

Normative Beliefs about Social Withdrawal

The 6 items shyness sub-scale of the *Normative Beliefs about Social Withdrawal* scale were subjected to exploratory factor analyses (EFA). The scree plot suggested that

one or two components should be retained in the model. The Kaiser-Meyer-Olkin measure of sampling adequacy was .747, above the recommended value of .6, and Bartlett's test of sphericity was significant ($\chi^2(15) = 2906.60, p < .001$). The communalities were all above .3 (range from .395-.604), further confirming that each item shared some common variance with other items. Running the EFA without rotation indicated one component with eigen values greater than 1 (eigenvalue = 3.13), explaining 52.19% of the variance, with factor loadings from .67 to .78 (see Table 1) and Cronbach's $\alpha = .82$.

Next, the psychometric properties of the measure for use with both samples and the invariance across samples were assessed. Specifically, a Confirmatory Factor Analysis (CFA) was used to establish the baseline model for further measurement invariance analyses. To evaluate the absolute model fit, we used the following fit indices: Bentler's Comparative Fit Index (CFI), Bollen's Incremental Fit Index (IFI), Root Mean Square Error of Approximation (RMSEA), Standardized Root Mean Squared Residual (SRMR) and χ^2 test of significance (see Hu & Bentler, 1999; Kline, 2005). Close fit is indicated by CFI, TLI values > 0.90 (Hu & Bentler, 1999). In addition, a close fit is indicated by RMSEA values < 0.06 , whereas adequate fit is indicated by values between 0.06 and 0.08.

The multi-group CFA was used to assess the measurement invariance of the best-fitting baseline model across and between two culture groups. Configural invariance is evaluated with the same model fit indices noted above (i.e., χ^2 , CFI, TLI, RMSEA). Metric invariance is supported if the model fit does not degrade significantly relative to the configural model ($\Delta CFI < .01$ and $\Delta RMSEA < .015$), and scalar invariance is

supported if the model fit does not change significantly relative to the metric model ($\Delta\text{CFI} < .01$ and $\Delta\text{RMSEA} < .015$) (Chen, 2007). The nested chi square difference testing was not used due to its recognized sensitivity to sample size (Cheung & Rensvold, 2002). Model did not have a good fit with the data (Model fit statistics: $\chi^2(14) = 781.68$, $p < .001$; CFI = 0.77; TLI = 0.65; RMSEA = .198; SRMR=.078). Factor loadings across two countries were shown in Table 2. Based on the factor loadings, item13 was deleted. The model did not have a good fit with the data (Model fit statistics: $\chi^2(9) = 590$, $p < .001$; CFI = 0.78; TLI = 0.64; RMSEA = .21; SRMR=.08). Then, item 16 was deleted, the model did not fit well with the data (Model fit statistics: $\chi^2(5) = 526$, $p < .001$; CFI = 0.78; TLI = 0.56; RMSEA = .27; SRMR=.08). We decided to keep one depiction of each gender of the actor and one general depiction. So item 16 was kept and item 1 was deleted. Again, the model still did not have a good fit with the data (Model fit statistics: $\chi^2(5) = 115.89$, $p < .001$; CFI = .88; TLI = 0.87; RMSEA = .12; SRMR=.05). At last, item 7 was deleted, only items 2, 8, and 16 were included in the final model. The model did have a good fit with the data (Model fit statistics: $\chi^2(2) = 32.76$, $p < .001$; CFI = 0.98; TLI = .94; RMSEA = .085; SRMR = .02) and Cronbach's $\alpha = .72$. Therefore, the final model included these three items.

Results of all invariance models are reported in Table 3. Because that there are only three items, the configural factorial invariance model between the two countries was just identified. The full metric factorial invariance was established between the two countries, indicating that participants understood the underlying latent construct of attitude about shyness in the same way. Full scalar factorial invariance across the Canadian and Chinese samples was also supported, suggesting that means of attitude

about shyness could be compared between these two samples. However, the strict factorial invariance were not supported, indicating that the error terms are not equivalent between these two samples. Researcher argued that this level is hard to establish in practice (Timmons, 2015).

Descriptive statistics and correlations are presented in Table 4. To test the primary hypotheses, a two-way ANCOVA was conducted to test for gender differences, country, their own shyness in participants' normative belief about shyness. Levene's test and normality checks were carried out and the assumptions met. Results indicated a significant main effect for participants' own shyness, $F(1, 1301) = 7.69, p < .001$, and country $F(1, 1301) = 305.86, p < .001$, but no gender differences was found ($F(1, 1301) = .023, p = .88$). Two-way interaction of gender and country effect was not significant ($F(1, 1301) = 3.19, p = .075$). Simple effects testing revealed that Canadian participants were more accepting of shy behavior ($M = 3.03, SD = .028$), as compared to Chinese participants ($M = 2.39, SD = .023$).

For the main effect of Participant shyness, pairwise comparisons were conducted of normative beliefs at high (1 SD above the mean), medium (at the mean), and low (1 SD below the mean) levels of participant shyness (using the Scheffé post hoc criterion for significance). Results indicated that normative belief about shyness were most positive among participants who reported higher levels of shyness ($M = 2.77, SD = .31$), followed by medium ($M = 1.79, SD = .31$), and low ($M = .88, SD = .24$) levels. The high shyness group of participants reported significantly more positive beliefs about shyness than both the medium and low shyness groups (p 's $< .001$), which did not differ from each other ($p = .589$).

Table 1

Descriptive Statistics and item factor loadings for Normative beliefs about Social Withdrawal Scale (shyness sub-scale)

Items	Item content	M	SD	Factor
1	Do you think it's OK for John to just watch others hang out?	2.34	.80	.71
2	Do you think it's OK for John to spend time alone?	2.87	.95	.74
7	Do you think it's WRONG for Becca to just watch others hang out	2.29	.78	.77
8	Do you think it's WRONG for Becca to spend time alone?	2.69	.94	.78
13	In general, it is WRONG to avoid others due to nervousness.	2.25	.80	.67
16	It is usually OK to turn down chances to talk and be with other people because you feel too shy.	2.40	.79	.69

Note. Scores range from 1 to 4.

Table 2

Factor Loadings for Normative Beliefs about Social Withdrawal Scale (shyness subscale) Across Two Countries

Items	China	Canada
1	.63	.61
2	.70	.68
7	.72	.69
8	.76	.70
13	.51	.50
16	.54	.50

Table 3

Fit Statistics for the Multi-Group Confirmatory Factor Analysis Across Two Countries

(only item 2, 8 and 16 were included)

Model Tested	χ^2	df	$\Delta\chi^2$	Δ df	p	RMSEA	Δ RMSEA	CFI	Δ CFI
Configural Invariance	0	0	—	—	—	.000	—	1	—
Metric Invariance	1.64	2	1.64	2	.44	.000	.000	1	.000
Scalar Invariance	32.44	4	30.8	2	.001	.018	.018	.96	-.004
Strict Invariance	66.7	7	34.26	3	.001	.11	.092	.93	-.03

Table 4

Inter-correlations among Study Variables

	1	2
1. Participants' own shyness	-	
2. Normative belief about shyness	.109**	-
<i>Mean</i>	1.79	2.65
<i>SD</i>	.59	.71
<i>Min</i>	1	1
<i>Max</i>	4	4
<i>n</i>	1357	1386

* $p < .05$; ** $p < .01$; *** $p < .001$

Study 1- Discussion

It is necessary to understanding individuals' attitudes about shyness, since attitudes toward shyness are expected to affect responses to shy behaviours. Examining this question will help us understand if, to what degree, and why, shyness appears to be viewed negatively in both Western and non-Western cultures. Moreover, despite changes in the correlates and outcomes of shyness in China (that are being interpreted as representing a change in normative beliefs), there have been no studies directly assessing attitudes about shyness in modern Chinese society. Thus, the primary goal of Study 1 was to expand the previous research by investigating the measurement invariance of the NBSWS (shyness sub-scale) across the two cultural groups, and to explore the differences in normative beliefs about shyness between Canadian and Chinese samples. The results indicated that emerging adults' normative beliefs about shyness depended upon both culture and participants' shyness.

Measurement Invariance across Two Cultural Groups

First, results from Study 1 provided evidence for the measurement invariance of the NBSWS (shyness sub-scale) across two cultural groups. In a previous study, this measure was demonstrated to have sound psychometric properties in samples of Canadian and US university students (e.g., all factor loadings $> .63$; internal consistency: $\alpha = .78$) (Bowker et al., 2019). Study 1 demonstrated that a 3-item version of the shyness scale of the NBSWS displayed good psychometric properties across Canadian and Chinese samples. These results suggested that individuals from different cultural groups conceptualized their attitudes toward shyness in the same way. Moreover, participants appeared to understand the underlying latent construct of attitudes about shyness in a similar manner.

This finding of measure invariance across samples allowed for the direct comparison of means across cultures.

Normative Beliefs about Shyness across Two Cultural Groups

Overall (and contrary to expectations), results from Study 1 indicated shyness was actually viewed more *negatively* in China as compared to Canada. As discussed before, Chinese society has transitioned from a more traditional hierarchical society to one where social initiative and autonomy is increasingly accepted and valued (Chen et al., 2005). Rapid social changes in urban China toward a market-oriented society may create a need for young people to focus on the self-expression (Chen et al., 2005). Therefore, shyness may become incompatible with the social requirements and is no longer an adaptive trait in such society (Chen et al., 2006). Moreover, collective cultures emphasize group harmony and individual responsibility to the group, so following social norms is a core goal that guides each individual's attitude and behavior (Kim & Markus, 1999). Thus, Chinese people feel a strong sense of unity and are more likely to conform to the new cultural values instead of individual preference.

In Western culture, shyness has gained increasing interest and recognition in recent years by both researchers and the general public. For example, *Social Anxiety Disorder* (SAD) (which shares conceptual similarity with shyness) is now recognized as the most common mental disorder, with a lifetime prevalence of up to 12% in Western countries (Fehm et al., 2005; Kessler et al., 2005), and between 4% and 8% of the general population suffering from SAD in a given year (Hettema et al., 2001; Fehm et al., 2008). and SAD is a prevalent disorder with onset typically in late childhood (Beidel, 1998; Ballenger et al., 1998). Accordingly, it is perhaps not surprising that many interventions

designed to assist such shy and SAD individuals. For example, *Social Skills Training* (SST) programs are designed to help behavioral deficient individuals with a specific set of abilities, such as learning and engaging in relevant behavioral skills in order to improve social interactions (Farmer & Chapman, 2009). *Cognitive-Behavioral Group Therapy* (CBGT; Albano, Marten, Heimberg, & Barlow, 1995) is an example of one of these programs which was developed specifically to treat adolescents with SAD. This type of intervention includes psychoeducation about the social anxiety, behavioral exposure and also teach them how to solve interpersonal problems. Because that public know shyness very well and a lot of treatment programs are aimed to help shy individuals, peoples in Western culture might more tolerate shy behaviour, as compared to Chinese people.

Moreover, in recent years, many programs aim to reduce the stigma about seeking treatment for mental health problems in Western countries (Thornicroft et al., 2014; Stuart et al., 2014a, 2014b, 2014c). For example, a Canadian program (*Opening Minds Anti-Stigma*) invited people who have experienced a mental health problem to tell their personal recovery stories (e.g., professional intervention) to the community. The results can be interpreted as a positive illustration of contact-based education reducing prejudicial attitudes and improving social acceptance of people with a mental illness (Stuart et al., 2014a, b, c). Reducing stigma about seeking treatment for anxiety disorders resulted in an increased proportion of anxious individuals seeking treatment, perhaps indicating that individuals in Western culture may be becoming more accepting shy behaviour.

Alternatively, methodological issue should also be taken into consideration. For example, some of the items were used in present study (e.g., item 2: “Do you think it’s OK for John to spend time alone? And item 8: “Do you think it’s WRONG for Becca to spend time alone?”) also tap into participant’s evaluation of the broader issue of choosing to spend time in solitude. In Western cultures, choosing to spend time alone (sometimes called *unsociability*) is not typically related to adjustment difficulties (for a recent review, see Coplan, Ooi, & Baldwin, 2019). For example, Coplan, Ooi, Xiao, and Rose-Krasnor (2017) demonstrated that unsociable children do not have peer problems and do not feel social anxious or depressive. Researchers have argued that this non-fearful preference for spending time alone can be perceived as a personal choice in Western culture (Burger, 1995; Chen, 2010; Leary, Herbst, & McCrary, 2003). Thus, Western people are more likely to have less negative attitude toward unsociability. In contrast, in Chinese cultural context, intentionally removing oneself from the peer group is perceived as anti-collective, selfish, and abnormal (Chen, 2009). Therefore, unsociability is a salient predictor of child internalizing problems throughout development in Chinese culture (Liu et al., 2015; Liu et al., 2017). Indeed, past research on unsociability among Chinese children has revealed that unsociability is associated with a host of social and psychological issues (Coplan et al., 2016; Liu et al., 2015; Liu et al., 2017; Liu et al., 2014). For example, Liu et al. (2014) found that unsociability was associated with loneliness across the school year among Chinese children. Therefore, as compared to people in Western culture, Chinese people might have more negative attitude toward unsociability. In the present study, students might consider these items as unsociability

not shyness, thus, Chinese students might evaluate more negatively, as compare to Western students.

Normative Beliefs toward Shyness and Self-Reported Shyness

Shy behaviours were also viewed as most acceptable by participants who rated themselves as more shy. The findings could be viewed as support for *Cognitive Dissonance Theory* (Festinger, 1957). This theoretical model suggests that when people's beliefs and opinions are inconsistent, discomfort will arise and produce pressure to reduce or eliminate the dissonance. Thus, individuals will make efforts to align their attitudes/beliefs and behaviours to avoid cognitive dissonance. In this regard, shy individuals may be especially likely to be more accepting of others' shy behaviors, which is similar to their own (e.g., *shared* motivations). Moreover, according to Wilson, Lindsey, and Schooler's (2000) dual attitudes model, implicit attitudes reflect positive and negative associations accumulated through their own experiences (Dovidio, Kawakami, & Beach, 2001; Petty et al., 2006; Rudman, 2004), and it can be activated automatically upon encounter of a relevant stimulus. Thus, compared with people who are more sociable, shy individuals may experience more rejection and victimization (Karevold et al., 2012), which could help them better understand and more empathetic toward shy behavior. In contrast, non-shy individuals are less likely to understand shy behavior, and thus have more negative implicit attitudes toward shyness than shy individuals. Indeed, Coplan et al. (2011) found that outgoing teachers rated shy children as being significantly less intelligent than their peers, however, shy teachers reported no significant differences in intelligence. The authors argued that shy teachers might be

more empathetic toward shy individuals, and demonstrate a deeper understanding of their shyness compared with more sociable people.

Limitations and Future Directions

This study provides some of the first evidence of the complex nature of emerging adults' normative beliefs about shyness. Notwithstanding, there are some limitations that should be considered. To begin, we were not able to directly test whether shyness beliefs explain the difficulties (or lack thereof) associated with shyness. For example, in a meta-analysis of 128 studies, Glasman and Albarracín (2006) found that people's attitudes more strongly predicted their behavior when participants had more experience with the attitude object and reported their attitudes frequently. Thus, there is still much to learn with regard to if, how, and under what circumstances, attitudes may predict subsequent behaviours. And such a test is a critical next step in this area of research.

Moreover, self-report measure was used to explore people's normative belief about shyness. therefore, respondent bias is a limitation. For example, researchers argued that self-reported attitude is controllable, intended, made with awareness (Greenwald & Banaji, 1995). Thus, some people might be unwilling to report their real attitudes. To address this possible limitation, we developed an indirect measure to assess attitudes toward shyness.

At last, as discussed before, some items of NOBSWS were used in the present study may have tapped more into participants' evaluation of unsociability than shyness, which thus evoked more negative responses among Chinese students. Thus, in future studies, researchers should consider developing a self-report method which measures shyness or shy behaviour, but not other types of social withdrawal.

Despite these limitations, we hope that our findings will lead to additional studies focused on whether normative beliefs about shyness do in fact explain linkages between shyness and adjustment, and whether beliefs about shy behaviour differ across age and contexts.

Study 2:

Assessing Implicit Attitudes about Shyness in Canada

Gordon Allport (1935) characterized *attitudes* as social psychology's "most distinctive and indispensable concept" (p. 798). The important influence of attitudes on peoples' behaviours has been widely accepted by scholars for decades (Greenwald, Poehlman, Uhlmann, & Banaji, 2007). However, starting in the 1970s, more and more researchers argued that psychology should not only rely on self-reports (Baston & Vosgerau, 2016). For example, Jones and Sigall (1971) showed that assessments of individuals' attitudes can be very influenced by social desirability when measured directly and explicitly. Similarly, Nisbett and Wilson (1977) argued that if people were aware of their attitudes, they might seek to find explanations for such preferences. For example, a person's appearance tends to be perceived as more attractive by individuals who like them. Furthermore, according to *Self-Perception Theory* (Bem, 1972), we come to know our own attitudes, emotions and other internal states as by inferring them from observations of our own past behaviours.

In more recent years, it has become widely believed that most of human cognition occurs *outside* of conscious awareness and control (Greenwald et al., 1995). For example, if you asked participants "are you a racist?", most of their answers would be no, but in some cases, their behaviours would not be consistent with their words. This could be because participants may not want to tell psychologists their "real" thought, or it may be their behaviours happened automatically, outside of awareness or control (Chen & Bargh, 1997). This type of cognition was defined as *implicit* cognition, which may have a great

influence on individual's perceptions, attitudes, or behaviours, especially towards some certain social groups or certain behaviours (Nosek, Hawkind, & Frazier, 2012).

Overview of Implicit Attitudes

It is widely believed that a full understanding of an individual's behaviours requires the knowledge not only of the external situation, but also of an individual's internal psychological attributes (Fazio & Olson, 2003; Houwer, Teige-Mocigemba, Spruyt, & Moors, 2009). This important distinction between implicit and explicit attitudes has emerged in the cognitive psychology literature over the last twenty years (Bargh & Chartrand, 1999; Greenwald et al., 1995). From the theoretical perspective, *implicit* attitudes refer to actions or judgments under the control of automatically activated evaluation, without the performer's awareness of that causation (Greenwald et al., 1995). Similarly, Colman (2015) defined implicit attitudes as "an attitude activated without conscious awareness by memory of past experiences" (p. 367).

Implicit attitudes play an important role in predicting people's behaviours (Greenwald et al., 1998). For example, when exposed to an advertisement incidentally, people are more likely to purchase advertised products even they are explicitly trying to avoid them (Barzilai et al., 1999). Similarly, implicit attitudes were found to be better predictors of voting behaviours in German election than explicit attitudes (Frieze, Blumke, & Wanke, 2007).

Researchers also assume that implicit attitudes can capture most of the aspects of human thought that are not typically revealed by assessments of explicit attitudes (e.g., self-report measures, Green et al., 2007). Therefore, from an assessment perspective, implicit attitudes refer to an attitude, preference, or evaluation which are inferred from an

indirect test, such as the recording of participants' reaction times (or other measurements of sub-conscious behaviours) to assess participants' automatic reactions to target groups or concepts (Nosek, Greenwald, & Banaji, 2006). Researchers have further argued that as compared to the self-report measures, implicit measures provide an assessment of attitudes or cognitions of which participants: (1) are not aware is being measured (Brunel et al., 2004); (2) do not have conscious access to (Asendorpf et al., 2002); or (3) cannot control the measured results (Fazio et al., 2003). Thus, as compared to explicit assessments, implicit measures can better avoid self-presentation strategies and social desirability (Greenwald et al., 1998).

These *indirect* measures have provided a wealth of information about the general characteristics of implicit attitudes. For instance, implicit attitudes have been demonstrated to predict behaviours such as choices, judgments, and nonverbal behaviours toward members of other social groups (Fazio et al., 1995; Greenwald et al., 2005). In a meta-analysis of 156 studies, Greenwald et al. (2009) found that implicit measures correlated significantly with direct measures of behaviours. In some cases, implicit attitude scores were found to be better predictors of individuals' behaviours as compared to explicit measures of the same attitudes. For example, Asendorpf, Banse, and Mucke (2002) found that spontaneous expressions of shyness (e.g., facial adaptors, body adaptors, tense body posture) in individuals was better predicted by a shyness-oriented implicit test than by explicit self-ratings of shyness. Thus, in some ways, implicit measures seem to capture attitudes and beliefs that we hold, but that which find it difficult to consciously and explicitly access ourselves.

Indirect assessments have been used to measure a wide range of implicit attitudes, including views about gender, age, religion, and different commercial brands (Greenwald et al., 2007; Nosek et al., 2007). In recent years, use of implicit attitude testing has continued to expand to include a wide range of psychological research areas, including consumer psychology (e.g., Panzone, Hilton, Sale, & Cohen, 2016), social psychology (e.g., Spencer, 2018), health psychology (e.g., Florian & Volkmar, 2015), personality psychology (e.g., Sawaumi, Fujii, & Aikawa, 2016), developmental psychology (e.g., Timothy & Chester, 2014) and clinical psychology (e.g., Schwart & Mazouni, 2017). The research on implicit attitudes has demonstrated that much of human's mental work happens outside of people's conscious awareness, conscious control and without intention (Greenwald et al., 1998).

Theoretical foundations. Initially, researchers believed that implicit and explicit cognitions reflected a single attitudinal construct (Chaiken, Liberman, & Eagly, 1989; Van Overwalle & Siebler, 2005). According to this view, implicit cognitions, explicit attitudes, and attitude-related behaviours should all be strongly inter-related. From this perspective, cognitions can be conceptualized like a giant *iceberg*, with explicit attitudes residing above the surface of the *water* (i.e., in conscious control) and implicit cognitions residing below it (i.e., not in conscious control) (Van Overwalle et al., 2005). However, in recent years, more and more studies have demonstrated that implicit and explicit cognitions are actually relatively independent from each other (Wilson et al., 2000).

For instance, some studies have found changes in explicit but not implicit attitudes (e.g., Gawronski & Strack, 2004). For example, Gawronski et al. (2004) randomly assigned participants to one of the two conditions: high versus low situational

pressure. Whereas participants showed more favorable explicit attitudes toward the initially counter-attitudinal positions under low situational pressure, implicit attitudes did not change across different conditions. In contrast, other studies have demonstrated changes in implicit but not explicit attitudes. For example, Olson and Fazio (2006) reported that people can reduce automatically activated racial prejudices (but not explicit attitudes) through implicit evaluative conditioning procedure in a short period of time.

If explicit and implicit attitudes represent a unitary construct, changes in one attitude should usually be associated with corresponding changes in the other attitude (Overwalle & Siebler, 2005). Accordingly, Wilson (2000) argued that people may employ a dual-process of cognition. According to this *Dual-Process Theory*, having two types of cognition introduces the possibility that they can conflict (Gawronski et al., 2004). In this regard, explicit attitudes reflect individuals' values, beliefs, and opinions about the world (Petty, Tormala, Brinol, & Jarvis, 2006), whereas implicit attitudes reflect positive and negative associations accumulated through their own experiences (Dovidio et al., 2001; Petty et al., 2006; Rudman, 2004). Importantly for this dissertation research, implicit attitudes are also influenced by *culture* (Karpinski & Hilton, 2001). Thus, these two kinds of cognition are independent, which make separate and unique contribution to individuals' behaviours.

Another theory that attempts to explain differences between explicit and implicit attitudes is the *Motivation and Opportunity as DEterminants* (MODE) model (Fazio 1990; Fazio & Towles-Schwen, 1999; Olson & Fazio, 2002). According to this model, there are two types of attitude-behaviour processes. The first is *spontaneous* processing, which refers to instances when individuals are not aware of the influence their attitudes

have over their behaviours (Fazio et al., 1999). The spontaneous process is easily activated from individuals' memory when encountering certain attitude-related objects, and it can then affect the interpretation of the information (Higgins, Rholes, & Jones, 1977; Schuette & Fazio, 1995). For example, when pictures related to smoking (e.g., the picture of a cigarette) are presented to smokers, it would remind them of "feel good" or "release stress" automatically. Even though they know that smoking is very unhealthy, it is still difficult for them to stop smoking (De Houwer, Custers, & De Clercq, 2006). Numerous studies have demonstrated that attitudes arising from such automatic activation appear to affect people's behaviours more strongly than "controlled attitude" (Fazio, 1990; Fazio, 2007; Gawronski & Bodenhausen, 2006).

In contrast, *deliberate* processing refers to when individuals are consciously aware of their attitudes' influence over their behaviours and it involves careful consideration of all the available relevant cues (Fazio et al., 1999). In such cases, instead of being guided by preexisting attitudes, this more deliberate process influences people's behaviours by having them thoughtfully analyzing the available information, and then criticizing both positive and negative aspects of each attribute of the objects (Ajzen & Fishbein, 1980). For example, if you ask a friend about their attitudes toward a product, they usually answer this question after thinking of their own experiences related to this product (e.g., price, quality).

Thus, as compared to the spontaneous process, the deliberate process involves more effort and cognitive resources. However, according to the MODE model, it is impossible that processes are either purely spontaneous or purely deliberative. Instead, individuals will employ a *mixed* process which involves both controlled and automatic

components (Fazio et al., 1999). Moreover, two moderating factors were proposed that determine how much each process will be activated, motivation and opportunity (Fazio, 1990).

Motivation refers to individuals' desire to control prejudiced reactions or behaviours (Olson & Fazio, 2009). When people's motivation is low, they are more likely to make decisions based on information that immediately comes to mind (Fazio et al., 1999). Specifically, during this situation, more accessible information from memory is easier to activate and then influences individual's decisions and behaviours. In contrast, when people's motivation is high, they are more likely to make decisions based on the outcomes of analyzing the available information because they are more willing to devote resources to the decision process (Olson et al., 2009). For example, compared to buying junk food, purchasing a house should be a deliberative behaviour given the costs of this purchase. According to the MODE model, people are more likely to make this larger decision relying on and thoughtfully analyzing all available information.

The *opportunity* refers to the available time and cognitive resources relevant to the decision process (Fazio, 1990). When there is less opportunity to activate available information, people are more likely to rely on information that quickly comes to mind (Fazio, 1990). Without opportunity (e.g., less time or less information), even if people are motivated, they may not be able to make a deliberative judgment. For example, assume that you are asked to choose one of two new products of milk, but no information about these products or the company are provided. How would you choose? People might choose one just because they like the colour of the package. Taken together, implicit attitudes were

shown to directly predict spontaneous behaviours when motivation to control one's prejudice is low and when opportunity is low (Olson et al., 2009).

Both of these theories forward the notion that implicit and explicit attitudes are relatively independent from each other. Nosek (2007) also argued that explicit and implicit attitudes have little in common in terms of their different measurement methods. There is growing empirical support for this assertion. For example, in the area of racial prejudice and stereotypes, results from a meta-analysis indicated that interracial behaviour (White-Black) and other intergroup behaviours were better predicted by implicit than with direct methods (Greenwald et al., 2009). Further, indirectly measured variables also tend to better predict relatively uncontrollable behaviours, such as the amount of eye-contact in interracial interactions (Fazio et al., 2003). In one study, Nosek (2007) randomly assigned participants to complete an IAT and parallel self-report measures for one of more than 50 topics (e.g., Summer-Winter; USA-Japan; Old people - Young people). The results showed that correlations varied widely from weakly positive (below .20; e.g., Asians-Whites) to strongly positive (above .75; e.g., pro-choice-pro-life), with a median correlation of .48. Within the domain of prejudice and stereotypes, correlations between implicit and explicit attitude tend to be quite low (e.g., Devine et al., 2002; Fazio et al., 1995; Greenwald et al., 1998; Kawakami & Dovidio, 2001; Monteith et al., 2001; Rudman & Glick 2001, Rudman & Kilianski, 2000).

Assessments. Assessing explicit attitudes is generally more straightforward than assessing implicit attitudes. For example, an explicit assessment approach to measuring math ability might ask “how good are you at math?”. This response can then be compared to a performance-based measure of math ability, such as a score on a standardized test.

However, when the target construct concerns a preference, attitude, or stereotype, issues about interpretation turn out to be more complex, because there is no assumed correct answer (Greenwald et al., 2009).

Implicit measures are indirect and are inferred from performance of certain tasks adapted from Cognitive Psychology (Gawronski, Hofmann, & Wilbur, 2005). Thus, compared to traditional self-report measures, implicit measures *infer* mental contents from participants' performance on the experimental paradigms. Several measures of implicit attitudes have gained popularity (across various areas of psychology) in the past 20 years, including the *Evaluative Priming Task* (Fazio, Jackson, Dunton, and Williams, 1995), *Response Compatibility Tasks* (Kornblum, Hasbroucq, & Osman, 1990), the *Extrinsic Affective Simon Task* (De Houwer, 2003), the *Go/No-Go Association Task* (Nosek & Banaji, 2001), and the *Affect Misattribution Procedure* (Payne, Cheng, Govorun, & Stewart, 2005).

One of the most prominent of these measures is the *Implicit Association Test* (IAT), developed by Greenwald et al. (1998). In the twenty years since its introduction, the IAT has been used in hundred studies (Sriram & Greenwald, 2009). The IAT is based on the notion that words that are believed to belong to the same categories (e.g., flower, pleasant) will be grouped together easier (i.e., faster) than those in different categories (e.g., insect, pleasant). Specifically, the IAT measures how closely associated any given attitude object (e.g., flower, insect) is with an evaluative attribute (e.g., pleasant or unpleasant words).

Typically, the IAT procedure involves a series of seven blocks (see Figure 1). In each block, participants are asked to categorize stimuli into two categories (Greenwald,

1998; Greenwald et al., 1998). For example, in the first stage (Block 1), participants would be presented with the target (categories) words (e.g., "flower" and "insect") in the top left-hand corner and top right-hand corner of the computer screen (respectively). In the middle of the screen another word would appear that is typically associated with one or the other category words. For example, in the case of "flower", the word "rose" would appear, and for "insect", the word "bee". For each word that appears in the middle of the screen, participants are asked to sort the word into the appropriate category by pressing the appropriate left-hand or right-hand key. In the second step (Block 2), participants then categorize a different set of words as either pleasant or unpleasant by similarly pressing the appropriate keys.

In the third stage (Block 3 and Block 4), the previously learned categorizations are combined. Participants are instructed to press a key with their left hand if any given word is either an "insect" word or an "unpleasant" word and to press a different key with their right hand if any given word is either a "flower" word or a "pleasant" word. In the fourth stage (Block 5, Block 6 and Block 7), the response keys are reversed.

Sequence	No. Of trials	Task	Response key assignment	
			Left key	Right key
1	20	Practice	Flower	Insect
2	20	Practice	Positive	Negative
3	20	Practice	Flower, Positive	Insect, Negative
4	40	Test	Flower, Positive	Insect, Negative
5	20	Practice	Insect	Flower
6	20	Practice	Insect, Positive	Flower, Negative
7	40	Test	Insect, Positive	Flower, Negative

Figure 1. Schematic overview of the Implicit Association Test.

Block 3 and Block 6 are practice trials and Block 4 and Block 7 are experimental trials. Reaction times are recorded for each trial. What consistently emerges in the IAT is that people are quicker to respond when generally liked items are paired with positive words than when generally disliked items are paired with positive words.

Over the last 20 years, the IAT has been widely used by researchers in developmental psychology (e.g., Baron & Banaji, 2006), clinical psychology (e.g., de Jong, Pasman, Kindt, & van den Hout, 2001), neuroscience (e.g., Cunningham, Johnson, Raye, Gatenby, Gore, & Banaji, 2004), market research (Maison, Greenwald, & Bruin, 2001), and many others to uncover and measure biases in a wide range of domains, including attitudes towards race (Greenwald et al., 1998), gender and age stereotyping (Rudman et al., 2000), and alcohol (Wiers et al., 2011). Recently, the IAT has also been used to measure implicit self-concept and personality traits, including shyness (Aikawa & Inagaki-Fujii, 2013) and anxiety (Egloff & Schmukle, 2002).

Results from these studies, and others, have demonstrated moderate predictive validity, large effect sizes, and relatively good reliability for IAT attitude measures, particularly in comparison with other implicit measures (e.g., Ajzen & Fishbein, 1977; Fazio, 1990; Kraus, 1995; Greenwald & Nosek, 2001). For example, IAT measures typically demonstrate internal consistency estimates between .70 and .90 (Hofmann, Gawronski, Gschwendner, Le, & Schmitt, 2005; Nosek et al., 2006).

It also should be noted that IAT has also attracted criticism by researchers (e.g., Arkes & Tetlock, 2004; Tetlock & Mitchell, 2009; also see General Discussion). For example, researchers criticized that the IAT shows modest test-retest reliability (Bar-anan & Nosek, 2014; Gawronski, Morrison, Phills, & Galdi, 2017). However, IAT

demonstrates higher (within-persons) test-retest reliability than other response-latency measures commonly used in psychological research, including Stroop and Priming tasks (Bar-Anan et al., 2014). In addition, the psychometric properties of the standard IAT have been found to be superior to many other measures of implicit attitudes, including the go/no-go association task, brief IAT, single-category IAT, personalized IAT, and pencil-and-paper IAT (Bar-Anan et al., 2014; Kurdi et al., 2018).

Furthermore, the IAT is aimed to assess individuals' attitudes toward the bipolar target, which reveals attitudes toward the two targets directly. Finally, the IAT is also a more flexible tool in tailoring assessment of attitudes toward specific targets and contexts, it can be adapted to measure positive or negative associations about any types of concepts. Accordingly, in the current research, IAT was selected to measure implicit attitudes about shyness among university students in Canada (and for Study 4 with students in China). Using IAT may help us to clarify the underlying dimensions of attitudes the certain behaviour and may provide suggestions for appropriate assessment of the effects of interventions.

Study 2: Goals, Research Questions, and Hypotheses

As discussed previously, shyness in Western cultures often invokes negative emotional and behavioural reactions from parents (e.g., Hastings et al., 1999; Kiel et al., 2012), teachers (e.g., Buhs et al., 2015; Fordham & Stevenson-Hinde, 1999), and peers (e.g., Archbell et al., in press; Coplan et al., 2007). In adulthood, shy individuals continue to struggle with relationship problem (Baker et al., 2010) and are prone to experience internalizing problems (Tackett et al., 2013). Thus, it is reasonable to hypothesize that in Western cultures, people also have negative implicit attitudes toward shy behaviours.

Previous research has examined implicit assessments of people's own shyness (Asendorpf, 2002; Tsutomu, 2013). For example, Asendorpf et al. (2002) use the IAT to assess participants' implicit personality self-concept (shyness; "self-shyness" vs "other-shyness"). Results showed that shyness-oriented IAT better predicted individuals' shy behaviours than explicit self-ratings of shyness. More specifically, explicit self-reports of shyness uniquely predicted indicators of more controlled shy behaviours (e.g., speech, illustrators), whereas IAT-measured shyness uniquely predicted indicators of spontaneous shy behaviours (e.g., facial expressions, body expressions, and tense body posture). Similarly, Tsutomu (2013) used the same method (shyness-oriented IAT) to test the reliability and criterion-related validity for measuring shyness among Japanese people. The results indicated a positive correlation between the scores of implicit shyness over a one-week interval, and negative relations to implicit self-esteem.

However, a review of the literature revealed no previous studies where researchers examined implicit attitudes about shyness as a trait. Fox et al. (2016) employed IAT to assess implicit views about *social anxiety*. Results showed that people automatically associated social anxiety with oddity (e.g., words such as strange and weird). Interestingly, results further suggested that people who scored higher on social anxiety were less likely to hold an implicit association between social anxiety and oddity.

As mentioned previously, researchers have argued that implicit and explicit cognitions are relatively independent from each other in terms of their different measurement methods (Wilson et al., 2000). The correlation between these two differences type of attitude is quite different depending on the topics (Nosek, 2005). For example, within the domain of prejudice and stereotypes, the correlations of implicit and

explicit attitudes tend to be quite low (Rudman et al., 2001). Shyness is less likeable and less acceptable in Western cultures, it was expected that people's explicit and implicit attitudes would be relatively consistent (i.e., both negative).

The role of personality will also be examined. As discussed before, individuals' own personality could also affect their implicit attitude (Festinger, 1957). Thus, shy people may be especially more accepting of others' shy behaviour which is similar to their own (e.g., shared motivations). Therefore, it was speculated that as compared with people who are more sociable, shy individuals might be more empathetic toward shy behavior, and thus would perhaps respond more positively and hold more positive implicit attitudes toward shyness.

Finally, people's attitudes toward shy behaviours of different genders were tested. Previous studies have suggested that shyness might be more acceptable for girls than for boys (Doey et al., 2014). Shy behaviour might be more consistent with traditional female's gender roles. Thus, compared to males, females may be more likely to understand this social fear and anxiety and have more sympathy towards shy behavior and thus have more positive implicit attitudes about shyness than males.

Given the novelty of this research, hypotheses must be considered as quite speculative in nature. Nevertheless, overall, it was expected that shyness would be perceived as more negative than positive. More specifically, reaction times would be shorter when the "same" category words (e.g. shyness, negative) appear on the screen together than "different" category words (e.g., shyness, positive). In contrast, people will react faster when "sociable" and "positive" words come out together on the screen. A positive correlation between implicit and explicit attitudes about shyness was also

expected. Furthermore, a positive relation between individuals' own personality (shyness) and their implicit attitudes about shyness was also expected. Finally, gender differences were also expected, with females expected to have more positive implicit attitudes about shyness than males.

Study 2 - Pilot Study 1: Generation and Evaluation of Target Stimuli

The IAT is assumed to reflect associations between concepts. However, to implement an IAT study, the first step is to select the stimuli (exemplar words) that represent those concepts (De Houwer, 2002). For example, to conduct a flower–insect IAT, you need to have a list of names of specific flowers (e.g., ROSE) and insects (e.g., COCKROACH) are presented together with specific positive (e.g., HAPPY) and negative (e.g., SAD) words. Researchers have previously argued that the exemplars chosen might impact upon IAT effects (De Houwer, 2002). For example, Steffens and Plewe (2001) used different female and male names to test gender stereotypes. Results showed that the effect of gender stereotype was twice as large when the positive words were stereotypical female adjectives (e.g., intuitive) and negative words were stereotypical male adjectives (e.g., brutal), as compared to when positive words were related to men (e.g., independent) and negative words were related to women (e.g., bitchy).

Thus, it is important for words in the IAT to be clearly representative of one pole of the concepts (Cockerham, Stopa, Bell, & Gregg, 2009). Therefore, this first pilot study was to examine students' understanding of shyness and the words used to represent this construct. More specifically, the goal of this pilot study was to generate and evaluate synonyms and antonyms for shyness and valence terms (positive/negative) that would then be used in a subsequent IAT study of attitudes shyness.

Method – Pilot Study 1

Participants and Procedure

Participants were $N = 484$ undergraduate students (99 males; $M_{\text{age}} = 19.97$ years, $SD = 4.149$) enrolled in PSYC1001, 1002, 2001, and 2002. All participants were recruited from the Carleton University undergraduate participant pool (SONA). The sample was ethnically diverse, with approximately 60.7% self-identifying as White/Caucasian, 8.9% as Black, 6.6% as Arabic, 2.5% as Hispanic or Latino, 1.2% as Native American, 4.3% as South Asian and 9.4% as North-East Asian. Study procedures were approved by the university Institutional Review Board. Upon obtaining consent, participants completed self-report measures administered via online survey websites. Participants received course credit for participation.

Measures

Demographic information. Participants were asked to provide basic demographic information (e.g., gender, age) (see Study 1).

Word selection. An initial set of target words related to shyness was selected based on previous relevant research (e.g., Asendorpf et al., 2002; Coplan et al., 2009) and by conducting informal focus groups with psychology faculty and graduate students with relevant content expertise. In total, seven words were initially selected to describe being *shy* (timid, coy, bashful, self-conscious, reserved, sensitive, and quiet) and six to describe the *opposite* of being shy (social, outgoing, bold, talkative, gregarious, and open).

After reviewing relevant literature of used in previous IAT tests (Anita & Jansen, 2002; Greenwald, Nosek, & Banaji, 2003; Maison et al., 2001), initial lists of 12 positive

words (competent, success, perfect, loving, magnificent, fantastic, pleasant, fun, happy, amazing, awesome, delightful) and 13 negative words (incompetent, failure, disgusting, useless, dismal, terrible, annoying, horrible, bad, sad, sorrow, upset) were also generated.

Word rating scale. Participants were asked to suggest relevant synonyms and antonyms for shyness (e.g., “what do you think is the closest synonym (i.e., word with the same meaning) for the word shy?”). Participants were then asked to rate each of these words based how well they represented a synonym or antonym of shyness (e.g., “for each of the following words, please indicate (by clicking on the appropriate response to what degree you think it represents a *synonym* (same meaning) for the word shy”). The same procedure was employed for the positive and negative words (e.g., “for each of the following words, please indicate (by clicking on the appropriate response) how much they reflect the attribute of positive). Ratings were made on a scale of 1 (not at all) to 5 (extremely scale)”). This complete protocol is provided in Appendix D.

Results – Study 2: Pilot Study 1

For *synonyms* of the word shy, 142 (29%) participants suggested the word “timid”, 79 (16%) suggested “introverted”, 64 (13.1%) suggested “reserved”, 62 (12.6%) suggested “quiet”, 21 (4.3%) suggested “bashful”, and 10 (2%) suggested “nervous”. Other words, such as “anxious”, “cautious”, “hesitant” and “insecure” were generated by only a small number (< 10) of participants. The results from the words rating scale showed that the words “timid”, “reserved”, “quiet”, “self-conscious” and “bashful” were rated as the most representative synonym for the word shy (see Table 5).

For *antonyms* of the word shy, 251 (51.2%) participants suggested “outgoing”, 60 (12.2%) suggested “confident”, 57 (11.6%) suggested “extroverted”, 21 (4.3%) suggested

“bold”, 15 (3.1%) suggested “loud”, 6 (1.2%) suggested “sociable”. The results from the words rating scale showed that the words “outgoing”, “sociable”, “talkative”, “bold” and “open” were rated as the most representative antonym for the word shy (see Table 6).

For the *positive* and *negative* words, the results from the words rating scale showed that the words “success”, “loving”, “happy”, “awesome” and “delightful” were rated as most reflective of the attribute of positive (see Table 7). In contrast, the words “failure”, “useless”, “terrible”, “horrible” and “bad” were rated as most reflecting of the attribute positive (see Table 8). Thus, these ten words (five positive, five negative) were selected for the IAT study. The two sets of words did not differ significantly in number of letters, $t(8) = .32, p = .76$, number of syllables, $t(8) = .158, p = .86$, or in word frequency, $t(8) = .89, p = .39$.

Table 5

Descriptive Statistics of the Degree of Similarity Ratings for Synonyms of Shy

Words	Not at all	Slightly	Moderately	Very	Extremely	Mean	SD
Timid	15	35	84	160	188	3.98	1.07
Coy	109	133	146	64	21	2.48	1.12
Bashful	117	98	107	102	55	2.74	1.34
Self- Conscious	41	93	142	146	58	3.19	1.13
Reserved	20	46	86	185	143	3.80	1.09
Sensitive	94	122	148	83	32	2.66	1.17
Quiet	20	49	103	180	128	3.72	1.09

Table 6

Descriptive Statistics of the Degree of Similarity Ratings for Antonyms of Shy

Words	Not at all	Slightly	Moderately	Very	Extremely	Mean	SD
Sociable	15	40	83	189	152	3.89	1.05
Outgoing	7	17	40	145	268	4.36	0.89
Bold	14	55	109	147	151	3.76	1.11
Talkative	10	42	114	185	123	3.78	0.99
Gregarious	25	74	169	153	54	3.80	1.03
Open	30	91	123	134	99	3.38	1.19

Table 7

Descriptive Statistics of the Degree of Similarity Ratings for Positive

Words	Not at all	Slightly	Moderately	Very	Extremely	Mean	SD
Competent	7	43	128	200	98	3.71	1.23
Success	4	27	83	205	158	4.02	1.09
Perfect	34	61	115	130	136	3.57	0.89
Loving	9	22	72	187	184	4.08	1.01
Magnificent	13	35	114	160	151	3.84	0.91
Fantastic	11	27	190	192	155	3.95	1.21
Pleasant	5	27	108	203	132	3.90	0.93
Fun	3	28	79	220	146	4.0	1.09
Happy	6	13	55	174	229	4.27	1.18
Amazing	12	27	92	170	176	3.98	1.07
Awesome	11	20	100	179	168	3.99	0.92
Delightful	7	20	75	205	168	4.06	0.99

Table 8

Descriptive Statistics of the Degree of Similarity Ratings for Negative

Words	Not at all	Slightly	Moderately	Very	Extremely	Mean	SD
Incompetent	38	39	98	175	125	3.65	1.06
Failure	49	43	54	129	200	3.81	1.23
Disgusting	49	40	71	124	191	3.77	0.89
Useless	46	36	66	129	197	3.82	1.12
Dismal	38	43	130	161	103	3.51	1.29
Terrible	43	22	70	151	189	3.88	1.09
Annoying	33	61	121	162	96	3.47	1.11
Horrible	39	30	55	149	202	3.93	0.89
Bad	37	35	97	160	145	3.71	0.99
Sad	39	73	139	129	98	3.36	1.12
Sorrow	38	74	121	149	94	3.39	1.09
Upset	46	72	126	150	84	3.32	0.98

Study 2: Pilot Study 2 – Evaluation of Additional Target Stimuli

Participants in Pilot Study 1 generated some words as synonyms for shyness (e.g., “introverted”, “nervous”) that were not on the list of words to be rated for degree of similarity. To evaluate the similarity of these new words, a second pilot study was conducted incorporating these new words.

Method – Study 2: Pilot Study 2

Participants and Procedure

Participants were $N = 235$ undergraduate students (79 males; $M_{\text{age}} = 19.57$ years, $SD = 3.149$) enrolled in PSYC1001, 1002, 2001, and 2002. All participants were recruited from the Carleton University undergraduate participant pool (SONA). The sample was ethnically diverse, with approximately 45.6% self-identifying as White/Caucasian, 14.9% as Black, 9.2% as Arabic, 0.9% as Hispanic or Latino, 1.3% as Native American, 11% as South Asian and 11% as North-East Asian. Study procedures were approved by the university Institutional Review Boards. Upon obtaining consent, participants completed self-report measures administered via online survey websites. Participants received course credit for participation.

Measures

Demographic information. Participants provided basic demographic information (see Pilot Study 1).

Word rating scale. Similar to Pilot Study 1, participants were asked to rate these words to see how well they represented the word “shyness” and “non-shyness” (e.g., for each of the following words, please indicate (by clicking on the appropriate response) to what degree you think it represents a *synonym* (same meaning) for the word shy). Ratings

were made on a scale of 1 (not at all) to 5 (extremely) scale (see Appendix E).

Results – Study 2: Pilot Study 2

Results indicated that the words “timid”, “reserved”, “quiet”, “self-conscious”, “introverted” and “hesitant” were rated as the most representative a synonym for the word shy (see Table 9). However, from conceptual basis, the word “introverted” was excluded because it is used to refer to a different trait in personality literature (Zelenski et al., 2014).

The words “outgoing”, “sociable”, “talkative”, “bold”, “extroverted” and “loud” were rated as most representative antonyms for the word shy (see Table 10). Similar to the word “introverted”, the word “extroverted” was excluded. The two sets of words did not differ significantly in number of letters, $t(8) = .59, p = .57$, number of syllables, $t(8) = .34, p = .74$, or in word frequency, $t(8) = -.47, p = .65$.

Drawing upon the results of these two pilot studies, five positive words (success, loving, happy, awesome, delightful) words, five negative works (failure, useless, terrible, horrible, bad) words, five synonyms words of shy (timid, reserved, quiet, self-conscious, hesitant), and five antonyms words of shy (sociable, outgoing, bold, talkative, loud) were selected for the IAT.

Table 9

Descriptive Statistics for the Synonyms of Shy

Words	Not at all	Slightly	Moderately	Very	Extremely	Mean	SD
Timid	19	35	66	67	41	3.33	0.98
Coy	54	48	80	34	8	2.53	1.12
Bashful	63	49	63	41	9	2.48	1.11
Self-Conscious	35	50	70	53	17	2.85	0.98
Reserved	32	38	57	74	26	3.11	1.1
Sensitive	55	59	52	52	10	2.57	0.99
Quiet	21	37	65	74	31	3.25	0.89
Introverted	19	49	59	59	39	3.22	0.87
Nervous	38	63	66	46	15	2.72	0.99
Afraid	60	80	48	32	8	2.33	0.12
Anxious	47	67	63	38	14	2.59	0.11
Cautious	47	51	77	44	8	2.63	0.91
Hesitant	38	49	81	45	16	2.79	1.13
Insecure	58	60	57	38	16	2.54	0.99

Table 10

Descriptive Statistics of Antonyms for Shy

Words	Not at all	Slightly	Moderately	Very	Extremely	Mean	SD
Sociable	14	23	60	63	67	3.64	1.11
Outgoing	9	27	39	74	78	3.81	0.98
Bold	16	35	47	68	62	3.55	0.89
Talkative	14	36	62	58	57	3.48	1.09
Gregarious	14	39	98	45	27	3.14	1.08
Confident	28	36	69	46	48	3.22	0.88
Open	20	48	62	60	38	3.21	1.11
Extrovert	18	37	48	57	68	3.53	1.12
Loud	34	37	54	51	52	3.22	1.1

Study 2 (Main Study):

IAT Testing in Western Culture

Having developed and validated the necessary target words in two pilot studies, the primary purpose of Study 2 was to explore implicit attitudes toward shyness. Given the literature previously reviewed, it was expected that shyness would be perceived as more negative than positive in Western culture, even at the unconscious level. More specifically, it was predicted that reaction times would be shorter when synonyms of shyness were paired on the screen together with negative words as compared to positive words. Similarly, reaction times were expected to be faster when antonyms of shy words (sociable) were paired with positive as compared to negative words.

A statistically significant (but moderate) relation between implicit and explicit attitudes toward shyness was expected. As well, positive relations were expected between participant personality (shyness) and both implicit and explicit attitudes toward shyness. Finally, compared to females, males were expected to demonstrate more negative implicit attitudes to shyness.

Study 2 - Method

Participants and Procedure

Participants were $N = 66$ undergraduate students (18 Males; $M_{age} = 20.05$ years, $SD = 4.025$) enrolled in PSYC1001, 1002, 2001, and 2002. All participants were recruited from the Carleton University undergraduate participant pool (SONA). The sample was ethnically diverse, with approximately 42.4% self-identifying as White/Caucasian, 13.6% as Black, 12.1% as Arabic, 6.1% as Hispanic or Latino, 9.1% as South Asian, and 13.6% as North-East Asian. Upon obtaining consent, participants first

completed the *Implicit Association Test*. After completing this portion of the experiment, participants were then asked to complete some brief questionnaires about their background, their own personality, and their beliefs about different personality characteristics and behaviours. After the experiment, participants received course credit for participation. Upon completion, participants received a comprehensive debrief (explaining the purpose of the study and providing contact information for appropriate resources pertinent to the material addressed in the study).

Measures

Demographic information. Participants were asked to provide basic demographic information (see Pilot tests).

Implicit Association Test. Participants were assigned randomly to one of two conditions that counterbalanced the order of category presentation. The test procedure involves a series of seven tasks (see Figure 2). Participants were presented with four categories of words at the beginning of each computer task: Shy (Timid, Reserved, Quiet, Self-Conscious, Hesitant), Non-shy (Sociable, Outgoing, Bold, Talkative, Loud), Positive (Success, Loving, Happy, Awesome, Delightful), and Negative (Failure, Useless, Terrible, Horrible, Bad).

The category labels (“shy”, “non-shy”, “positive” and “negative”) remained on screen for the duration of each block, whereas the target words changed randomly on each trial (with an ITI of 100 ms). Words from each category were presented in the middle of the screen and participants were asked to sort these words into either the left or right top corner of the screen. Errors of categorization were flagged by a red cross (for

200 ms) after which the next trial ensued without need for correction. Reaction times were recorded. The E-prime 2.0 program was utilized to create and conduct the IAT (see Appendix F).

Normative beliefs about shyness. Participants completed the 12-item *Normative Beliefs about Social Withdrawal Scale* (NOBSWS – see Study 1). Of particular interest was the subscale assessing normative beliefs about shyness.

Participant shyness. Participants also completed the *Revised Cheek and Buss Shyness Scale* (RCBS; see Study 1).

Overview of Data Analyses

IAT scoring. Following protocols for the improved scoring algorithm of IAT-D effects (Greenwald et al., 2003), trials exceeding 10,000 ms were removed. Participants were also excluded who had more than 10 percent of trials of less than 300 ms (one participant was excluded). As well, error trials with block mean plus 600 ms were replaced.

For each participant, the recommended IAT score D (see Greenwald et al., 2003) was computed by calculating the difference between the mean response latencies for the two test blocks (Blocks 4 and 7) and the two practice blocks immediately preceding the test blocks (Blocks 3 and 6), and then dividing that difference by its associated pooled standard deviation. In the current study, a positive D score indicates a faster reaction time for the Shyness/Positive pairing and a negative D score indicates a faster reaction time for the Shyness/Negative.

Outliers on the IAT (i.e., D scores exceeding ± 3.5 standard deviations from the mean) were excluded from the analyses, consistent with outlier removal approaches used in other IAT research (Ratcliff, 1993; Tukey, 1977).

Data screening. Data were screened for potential errors in data entry and then examined for missing values. Examination of the data for univariate and multivariate outliers was conducted, followed by testing of assumptions, multicollinearity, and normality.

Correlational analyses and MANOVA. Bivariate correlations among all study variables were conducted, and main effects of gender were tested through a one-way MANOVA (with follow up univariate analyses using Bonferroni correction, where appropriate).

Sequence	No. Of trials	Task	Response key assignment	
			Left key	Right key
1	20	Practice	Shy	Non-shy
2	20	Practice	Positive	Negative
3	20	Practice	Shy, Positive	Non-shy, Negative
4	40	Test	Shy, Positive	Non-shy, Negative
5	20	Practice	Non-shy	Shy
6	20	Practice	Non-shy, Positive	Shy, Negative
7	40	Test	Non-shy, Positive	Shy, Negative

Figure 2. Implicit Association Tests for Shyness: Task Sequence

Study 2 - Results

IAT scoring

An independent samples *t*-test was conducted to detect any significant differences in D scores ($M = -.36$, $SD = .53$) based on condition (i.e., order of pairings). Results indicated that this *t*-test was non-significant, $t(63) = 1.326$, $p = .321$. A one-sample *t*-test was then conducted, as is typically used for the IAT (see Glashouwer, Smulders, de Jong, Roefs, & Wiers, 2013), which yielded a significant result for the D score ($M = -.36$, $SD = .53$; $t(64) = -5.56$, $p < .001$, 95% confidence interval: $-.4925$ to $-.232$). This indicated that participants were significantly faster for the Shyness/Negative and Sociable/Positive pairing than for other pairings. These findings are consistent with the hypothesis that individuals automatically associate shyness with negative words as opposed to positive words.

The S-W test for D score ($SW = .97$, $df = 65$, $p = .13$) suggested that normality was reasonable assumption. The skewness (.49) and kurtosis (-.15) statistics further indicating substantial normality. The boxplot suggested a relatively positive distributional shape of the residuals.

Analyses of Other Study Variables

Missing data. For all the variables, missing data rates ranging from 1.5% to 4.5%. Little's (1988) MCAR test was not significant, $\chi^2(6) = 4.62$, $p = .594$, suggesting that the pattern of missingness was not systematic.

Outliers. A combination of different procedures was used to detect outliers. The box plots were used, Box plots present the median, quartiles, and extreme values of the distribution of the variable. Moreover, according to Stevens (2002), the variables were *z*-

transformed, and the cases with z -value > 3 are considered as outliers. No cases were identified as potential outliers.

Mahalanobis distance values were then examined in order to identify potential multivariate outliers in the dataset. Mahalanobis distance values greater than the corresponding critical χ^2 value (at $p < .001$) were identified as potential multivariate outliers. Again, no cases were identified as potential multivariate outlier.

Testing of assumptions. Assumptions of normality, linearity, and homoscedasticity was tested in the data. Examination of normal probability plots did not indicate any substantive departure from normality. However, The S-W test for *Normative Belief about Shyness* ($SW=.94$, $df=65$, $p=.009$) suggested that normality was could not be assumed. And the results from omnibus test of multivariate normality shows that it is not normally distributed ($p < .001$). Examination of histogram suggested that the variable had reasonably distinct tails and, as such, would likely not be dramatically improved by transformations. Moreover, none of the main study variables exceeded reference skew values (i.e., > 2) indicating substantial non-normality (range: $-.032$, -1.76). More importantly, some degree of non-normality was expected due the nature of the constructs being explored. At last, the MANOVA is known to be rather robust against violations of the normality assumption (Bortz, 1999; Stevens, 2002). Accordingly, transformations of the data were not conducted as it has been argued that transforming an inherently non-normal variable to force a normal distribution may have adverse implications (Kline, 2016).

Matrix Scatter plot is run to check the bivariate plot for departures from linearity, and the standardized residual plot is run to check the heteroscedasticity. Bivariate

scatterplots of all predictor and outcome variables were examined to identify potential non-linear (i.e., quadratic) associations. No obvious curvature was apparent in all cases. Finally, plots of residual versus predicted values gave no major indication of heteroscedasticity, suggesting constancy of variance (i.e., homoscedasticity).

Descriptive statistics and bivariate correlations. Descriptive statistics and correlations for all main study variables are presented in Table 11. D scores were also significantly and positively correlated with participants' own shyness ($r = .308, p = .013$), such that individuals higher in shyness were slower at pairing Shyness/Negative words in the IAT. In contrast, D scores were not significantly correlated with participants' normative beliefs about shyness ($t = -.058, p = .66$).

Gender differences. A MANOVA was performed to test for gender differences in D scores, participants' normative beliefs about shyness, and participants' own shyness. Results from the MANOVA indicated a nonsignificant multivariate main effect of gender on the D score ($F(1, 59) = .24, p = .624; M_{\text{female}} = -.39, SD = .51, M_{\text{male}} = -.28, SD = .57$), participants' normative beliefs about shyness ($F(1, 59) = .20, p = .654; M_{\text{female}} = 2.95, SD = .75, M_{\text{male}} = 3.05, SD = .65$) and participants' own shyness ($F(1, 59) = .18, p = .676; M_{\text{female}} = 2.52, SD = .65, M_{\text{male}} = 2.56, SD = .66$).

Table 11

Inter-Correlations among Study Variables

	1	2	3
1. D scores	-		
2. Participants' Shyness	.308*	-	
3. Explicit attitude to shyness	-.058	.039	-
<i>Mean</i>	-.36	2.5	2.8
<i>SD</i>	.52	.66	.31
<i>Min</i>	-1.19	1.11	1.0
<i>Max</i>	1.04	4	4
<i>n</i>	65	65	63

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Study 2: Discussion

A review of the extant literature did not reveal any previous studies of implicit attitudes about shyness. Drawing upon the developmental and implicit cognitive perspectives, Study 2 was the first research to develop and validate an implicit measure of attitude about shyness in a sample of emerging adults. Among the results, emerging adults automatically associated shyness with negative words (i.e., displayed a negative implicit attitude). However, participants who were more shy tended to have less negative implicit (but not explicit) attitudes toward shyness. No gender differences were found in this study. Thus, evidence supporting the main hypotheses was mixed. In the sections that follow, the main findings from Study 2 are briefly discussed. Given the methodological and empirical similarities across Studies 2 and 3, additional integrated discussions of the interpretations and implications are presented in Study 3 and the General Discussion.

Implicit Attitudes toward Shyness

Previous studies have shown that shyness is negatively valued by parents, teachers, and peers in the West (e.g., Bowker et al., 2016; Coplan et al., 2008; Coplan & Prakash, 2003; Hastings et al., 1999; Kingsbury et al., 2012). Results from Study 2 contributed to this literature by demonstrating that emerging adults in a Western culture (Canada) also have negative *implicit* attitudes about shyness. This finding concurs with the previous results of Fox et al. (2016), who reported that participants automatically associated social anxiety with oddity (e.g., words such as strange and weird). This finding is also consistent with previous studies showing that shy people tend to be rated as less friendly, likable, talented, happy, and even less physically attractive than their non-shy counterparts in North American samples (Jones, Cheek, & Briggs, 1986; Jones &

Russell, 1982; Pilkonis, 1977). Finally, these results also provided evidence of the validity of the IAT-Shyness newly developed for this study.

As expected, results also indicated that participant shyness was positively associated with implicit attitudes. Thus, shy individuals tended to hold less negative implicit views toward shyness than their more sociable counterparts. This finding is consistent with the results of Fox et al. (2016), who found that people who scored higher on social anxiety were less likely to hold an implicit association between social anxiety and oddity. This finding is also consistent with previous research suggesting that shy teachers perceive shy children's behaviours less negatively than non-shy teachers (Coplan et al., 2011). As well, the link between participant shyness and implicit attitudes about shyness can also be interpreted as additional evidence of the validity of the IAT-Shyness.

Finally, it was somewhat surprising that there was no significant association between explicit and implicit attitudes about shyness. This could be an indication of implicit and explicit attitudes representing two independent systems (Breen & Karpinski, 2013; Dabby et al., 2015; Gawronski & LeBel, 2008; Goldstein et al., 2014). Indeed, the existing literature comparing explicit attitude and implicit attitude has been somewhat mixed (Hofmann et al., 2005; Nosek, 2007). Some researchers have also suggested that the relation between implicit and explicit attitudes is particularly likely to be low in the case of stereotypes that represent sensitive social attitudes (Hofmann et al., 2005). However, it is not clear that shyness represents such a sensitive social topic.

It is also plausible that this lack of significant association may be attributable to methodological issues (Nosek, 2007). For example, the IAT is a *relative* measure of

evaluation (e.g., shyness vs. non-shyness), whereas explicit measures (*Normative Beliefs about Social Withdrawal Scale*) only assess single evaluations (e.g., shyness only), which may reduce the likelihood of eliciting a relation. Moreover, the small sample size in this study ($N = 66$) reduced statistical power and impacted upon the capacity to generalize the results.

Also contrary to expectations, the results indicated no significant gender differences in emerging adults' implicit and explicit attitudes about shyness, or in their self-reported own shyness. Small sample size may also have played a role here, as well as the unbalanced gender distribution of the sample (i.e., 77% female). Moreover, it also should be noted that some researchers have questioned whether a 20-trial practice in Block 5 can eliminate order effects (Greenwald et al., 1998). More recently, Nosek et al. (2005) suggested lengthening this block to 40 trials in order to eliminate such effects. This possible limitation was addressed in Study 3. Accordingly, in Study 3, every attempt was made to address these potential methodological limitations.

Study 3:

Online-IAT Testing in a Western Culture

Given that Study 2 was the first to explore implicit attitude toward shyness in emerging adults, replication of the results was needed to further increase the validity of the findings. Moreover, methodological limitations may have also influenced the findings. Accordingly, a number of changes were made to the measures and methodology for Study 3.

First, a revised measure of *Normative Beliefs about Social Withdrawal Scale* was used to assess participants' explicit attitude toward shyness. As discussed before, the NOBSWS was designed to measure participants' acceptability of shy behaviour that varied according to actor gender (i.e., male, female). Accordingly, it could not be used to directly compare participants' implicit and explicit attitudes. To address this concern in Study 3, instead of describing shy behaviours, the synonyms and antonyms of shyness from Pilot Study 2 (same as the words used in IAT) were used to assess participant's explicit attitude toward shyness.

The next set of changes were made to address issues regarding the small sample size. In-person testing of IAT is a labour intensive and time-consuming protocol using a lab-based computer keyboard-tracking task (*see* Study 2). In contrast, online data collection can expedite the data collection procedure by allowing researchers access larger samples more easily (Buhrmester, Talaifar, & Gosling, 2018). This not only helps to avoid substantial costs, but also provides more control over design and simplifies data management (Paolacci & Chandler, 2014). With these advantages in mind, Carpenter et al. (2018) designed an IAT that could be embedded within online survey tools (e.g.,

Qualtrics) via HTML and JavaScript. This approach was taken in Study 3, testing emerging adults' implicit attitudes about shyness using a web-based IAT (as compared to using a lab-based computer keyboard-tracking task). As well, as discussed in study 2, a 40-trial block 5 was included by default in order to further reduce order effects (see Figure 3).

Accordingly, the goal of Study 3 was to re-assess implicit and explicit attitudes in a sample of emerging adults, using a revised measure of normative beliefs about shyness, and employing a web-based assessment of IAT (Carpenter et al., 2018). Re-assessing these attitudes using a new measure of both implicit and explicit attitude in a separate sample (i.e., conducting a conceptual replication; Brandt et al., 2014) will: (1) allow for the removal of potential limitations or confounds in Study 2; and (2) increase the generalizability of the proposed psychological processes (Bonnett, 2012; Schmidt, 2009). Hypotheses were identical to those presented in Study 2.

Study 3 - Method

Participants and Procedure

Participants were $N = 650$ undergraduate students (99 Males; $M_{age} = 19.93$ years, $SD = 4.33$) enrolled in PSYC1001, 1002, 2001, and 2002. Upon obtaining approval from the *Carleton Psychology Research Ethics Board*, all participants were recruited from the Carleton University undergraduate participant pool (SONA). The sample was ethnically diverse, with approximately 59.8% self-identifying as White/Caucasian, 7.3% as Black, 5.6% as Arabic, 1.6% as Hispanic or Latino, 7.2% as South Asian and 6.0% as North-East Asian. Upon obtaining consent, participants first completed the online *Implicit Association Test*, followed by a series of self-report questionnaires about their background, their own personality, and their beliefs about different personality characteristics and behaviours using Qualtrics. After the experiment, participants receive 0.25% course credit for participation. Upon completion, participants received a comprehensive debrief (explaining the purpose of the study and providing contact information for appropriate resources pertinent to the material addressed in the study).

Measures

Demographic information. Participants were asked to provide basic demographic information (see Pilot tests).

Implicit Association Test. Participants were assigned randomly to one of four conditions that counterbalanced the order of category presentation (in Qualtrics, via a randomizer). Identical protocols were followed as in Study 1. We run IAT from with the survey software by iatgen (Carpenter et al., 2018). This software uses HTML code to

embed an IAT into an online survey built using Qualtrics. Iatgen runs the IAT procedure (and data cleaning/scoring) in accordance with Greenwald et al. (2003) guidelines.

Beliefs about shyness. Participants completed the 11-item *Beliefs about Shyness Scale* (BSS). This scale is adapted from *Normative Beliefs about Social Withdrawal Scale* which was used in study 2. In order to compare participants' implicit and explicit attitude directly, we rephrased each item. Specifically, instead of describing shy behavior, we used the synonyms and antonyms of shyness from Pilot Study 2 (same as the words we used in IAT). Participants were asked to rate each word base how much they accepted shyness. Participants rate the acceptability of each word on a 4-point Likert scale. A total score is expected to be computed with higher scores representing more normative beliefs about shyness (see Appendix G) .

Participant shyness. Participants also completed the *Revised Cheek and Buss Shyness Scale* (RCBS; see Study 1).

Overview of Data Analyses

IAT scoring. Following protocols for the improved scoring algorithm of IAT-D effects (Greenwald et al., 2003), trials exceeding 10,000 ms were removed. Participants were also excluded who had more than 10 percent of trials of less than 300 ms (66 participants were excluded). As well, error trials with block mean plus 600 ms were replaced. We used the iatgen applet (Carpenter et al., 2018) to compute standardized D scores for each participant. In the current study, a positive D score indicates a faster reaction time for the Shyness/Positive pairing and a negative D score indicates a faster reaction time for the Shyness/Negative. Outliers on the IAT (i.e., D scores exceeding \pm

3.5 standard deviations from the mean) were excluded from the analyses, consistent with outlier removal approaches used in other IAT research (Ratcliff, 1993; Tukey, 1977).

Preliminary analyses. Data were screened for potential errors in data entry and then examined for missing values. Examination of the data for univariate and multivariate outliers was conducted, followed by testing of assumptions, multicollinearity, and normality.

Factor analysis. The 6 items of the newly created *Beliefs about Shyness Scale* (BSS) were subjected to an exploratory factor analysis in order to explore the factor structure of the measure. Additional 5 items from Beliefs about Shyness Scale which representing the synonyms for sociability (non-shy) were included in the measure but only as filler items. The psychometric properties of the measure, such as, internal consistency reliability (Cronbach's α) were also be assessed.

Correlational analyses and MANOVAs. Bivariate correlations among all study variables were conducted, and main effects of gender were tested through a series of one-way MANOVAs (with follow up univariate analyses using Bonferroni correction, where appropriate).

Sequence	No. Of trials	Task	Response key assignment	
			Left key	Right key
1	20	Practice	Shy	Non-shy
2	20	Practice	Positive	Negative
3	20	Practice	Shy, Positive	Non-shy, Negative
4	40	Test	Shy, Positive	Non-shy, Negative
5	40	Practice	Non-shy	Shy
6	20	Practice	Non-shy, Positive	Shy, Negative
7	40	Test	Non-shy, Positive	Shy, Negative

Figure 3. Implicit Association Tests for Shyness: Task Sequence

Study 3 – Results

IAT scoring

An independent samples *t*-test was conducted to detect any significant differences in D scores ($M = -.65$, $SD = .55$) based on condition (i.e., order of pairings). A one-sample *t*-test was then conducted, as is typically used for the IAT (see Glashouwer et al., 2013), which yielded a significant result for the D score ($M = -.65$, $SD = .55$; $t(587) = -29.065$, $p < .001$, 95% confidence interval: $-.69$ to $-.60$; Cohen's $d = -1.198$). This indicated that participants were significantly faster for the Shyness/Negative and Sociable/Positive pairing than for other pairings. These findings are consistent with the hypothesis that individuals automatically associate shyness with negative words as opposed to positive words. The internal consistency of the IAT was assessed via a split-half procedure for the IAT (De Houwer & De Bruycker, 2007), estimate = 0.92.

The S-W test for D score ($SW = .95$, $df = 588$, $p < .001$) suggested that normality could not be reasonably assumed. However, this is expected in large (i.e., > 300) samples, and it is therefore recommended to rely on histograms and absolute values of skewness. The skewness (.815) and kurtosis (.223) statistics indicating substantial normality. The boxplot suggested a relatively positive distributional shape of the residuals. Moreover, examination of histogram suggested that all continuous variables had reasonably distinct tails and, as such, would likely not be dramatically improved by transformations (Kline, 2016).

Analyses of Other Study Variables

Missing data. For all the variables, missing data rates ranging from 1.8% to 5.1%. Little's (1988) MCAR test was not significant, $\chi^2(1018) = 1038.7, p = .32$, suggesting that the pattern of missingness was not systematic.

Outliers. A combination of different procedures was used to detect outliers. The box plots were used, Box plots present the median, quartiles, and extreme values of the distribution of the variable. Moreover, according to Stevens (2002), the variables were z -transformed, and the cases with z -value > 3 are considered as outliers. Nine cases were identified as potential outliers.

Mahalanobis distance values were then examined in order to identify potential multivariate outliers in the dataset. Mahalanobis distance values greater than the corresponding critical χ^2 value (at $p < .001$) were identified as potential multivariate outliers. Three cases were identified as potential multivariate outliers. Alteration or removal of such cases is generally not recommended, as they may be a true representation of the phenomenon being studied and are not likely to influence results when sample sizes are large. Indeed, deleting these cases did not significantly alter the pattern of results and, as such, these cases were retained.

Testing of assumptions. Assumptions of normality, linearity, and homoscedasticity was tested in the data. Examination of normal probability plots did not indicate any substantive departure from normality. However, several variables in the dataset met the criteria for being significantly skewed (i.e., z -scores > 1.96). And the results from omnibus test of multivariate normality shows that it is not normally distributed ($p < .001$). This is expected in large (i.e., > 300) samples, and it is therefore recommended to rely on histograms and absolute values of skewness, rather than relying

on z-scores (Kim, 2013). Examination of histogram suggested that the variable had reasonably distinct tails and, as such, would likely not be dramatically improved by transformations. Moreover, none of the main study variables exceeded reference skew values (i.e., > 2) indicating substantial non-normality (range: $-.096-1.19$). More importantly, some degree of non-normality was expected due the nature of the constructs being explored. At last, the MANOVA is known to be rather robust against violations of the normality assumption (Bortz, 1999; Stevens, 2002). Accordingly, transformations of the data were not conducted as it has been argued that transforming an inherently non-normal variable to force a normal distribution may have adverse implications (Kline, 2016).

Matrix Scatter plot is run to check the bivariate plot for departures from linearity. And the standardized residual plot is run to check the heteroscedasticity. Bivariate scatter plots of all predictor and outcome variables were examined to identify potential non-linear (i.e., quadratic) associations. No obvious curvature was apparent in all cases. Finally, plots of residual versus predicted values gave no major indication of heteroscedasticity, suggesting constancy of variance (i.e., homoscedasticity).

Beliefs about Shyness Scale. The 6 items of the *Beliefs about Shyness Scale* were subjected to exploratory factor analyses (EFA). The scree plot suggested one component should be retained in the model. The Kaiser-Meyer-Olkin measure of sampling adequacy was .885, above the recommended value of .6, and Bartlett's test of sphericity was significant ($\chi^2 (55) = 3431.799, p < .001$). The communalities were all above .3 (range from .47-.74), further confirming that each item shared some common variance with other items. There was one component with an Eigenvalues greater than 1.

The Eigenvalues showed that the one component explained 52% of the variance (Eigenvalue=3.58), The factor loadings from .54 to .85, Cronbach's α = .852. The results revealed that the current scale was internally reliable and had sound validity. Item loadings for each of the one component are presented in Table 13.

Descriptive statistics and bivariate correlations. Descriptive statistics and correlations for all main study variables are presented in Table 14. D scores were significantly and positively

correlated with participants' own shyness ($r = .19, p < .001$), such that individuals higher in shyness were slower at pairing Shyness/Negative words in the IAT. In contrast, D scores were not significantly correlated with explicit attitudes about shyness ($r = .06, p = .19$).

Gender differences. A MANOVA was performed to test for gender differences in D scores, beliefs about shyness, and self-reported shyness. Results from the MANOVA indicated a significant multivariate main effect of gender for beliefs about shyness ($F(1, 548) = 8.17, p = .004; M_{female} = 3.45, SD = .55, M_{male} = 3.24, SD = .59$). But there was no significant gender differences for D scores ($F(1, 548) = 0.49, p = .688; M_{female} = -.647, SD = .542, M_{male} = -.672, SD = .56$) or self-reported shyness ($F(1, 548) = 1.96, p = .162; M_{female} = 2.48, SD = .50, M_{male} = 2.41, SD = .42$).

Table 12

Descriptive Statistics for Beliefs about Shyness Scale

Items	Item content	M	SD
1	Shy	3.6	.675
2	Timid	3.34	.811
3	* Sociable	3.84	.498
4	Reserved	3.56	.644
5	* Outgoing	3.81	.487
6	Quiet	3.62	.641
7	* Bold	3.53	.664
8	* Talkative	3.56	.653
9	Self-Conscious	3.06	.94
10	* Loud	3.03	.875
11	Hesitant	3.18	.829

Note. Scores range from 1 to 4; * filler items

Table 13

Item Factor Loadings for Normative Beliefs about Shyness Scale in The Present Sample

Items	Item content	Factor
1	Shy	.81
2	Timid	.85
3	Reserved	.69
4	Quiet	.71
5	Self-Conscious	.54
6	Hesitant	.69

Table 14

Inter-correlations among Study Variables

	1	2	3
1. D scores	-		
2. Self-reported Shyness	.189**	-	
3. Beliefs about Shyness	.056	.02	
<i>Mean</i>	-.65	2.48	3.39
<i>SD</i>	.54	.49	.59
<i>Min</i>	-.17	1.11	1.5
<i>Max</i>	1.16	3.78	4
<i>N</i>	588	617	635

*Note.** $p < .05$; ** $p < .01$; *** $p < .001$

Study 3: Discussion

The aim of Study 3 was to re-assess emerging adults' implicit and explicit attitudes using a revised measure of beliefs about shyness and a web-based version of IAT-Shyness. Consistent with the findings of Study 2, emerging adults automatically associated shyness with negative words, but shyer participants tended to have less negative implicit attitudes about shyness. Again, contrary to hypotheses, implicit attitudes were not significantly related to explicit attitudes. Finally, gender differences were only found in normative beliefs about shyness (i.e., explicit attitudes). This study contributes to the extant psychology literature by extending the validity of web-based IAT and the model of dual attitudes to a new behavioural context (shyness). Findings are discussed in detail in the sections that follow, along with an integrative discussion of the meaning and implications of the findings from Studies 2 and 3.

Reliability of Web-Based IAT-Shyness

Results from the present study provided initial evidence of the psychometric properties and validity of the newly adapted web-based IAT-Shyness. This measure displayed good psychometric properties, including internal consistency higher than the meta-analytic average (.79; Hofmann et al., 2005) and reasonable error rates (i.e., 5-10% for most IATs, see Rudman, 2011). Consistent with Study 2, the web-based IAT also identified a strong negative IAT effect. Indeed, the results across studies were for the IAT D-scores were nearly identical. Thus, the survey-based IATs appear to be viable and valid, which consistent with previous survey-based IAT studies (Carpenter et al., 2018).

The web-based IAT-shyness has potentially major implication for future IAT studies. For example, this method offers the potential to increase the already widespread

use of the IAT. As noted earlier, IAT studies are typically conducted using small, in-person samples; however, small samples are less informative, yielding imprecise parameter estimates (e.g., slopes, correlations) and have been criticized as a factor leading to issues with replicability (Szucs & Ioannidis, 2017). Although it is certainly possible to collect a small online sample (or a large in-person sample), large online samples are typically more feasible (Buhrmester et al., 2018). Given that the IAT performs well online (Nosek et al., 2002), this may help push online research beyond self-report and allow for large, adequately powered tests of researchers' hypotheses in relatively shorter amounts of time. Moreover, the larger samples maximized statistical power and mitigated the influence of missing data and outliers (Dong & Peng, 2013; Wolf, Harrington, Clark, & Miller, 2013). Which also allow for more power to test other effects (e.g., age, gender, individual differences).

Implicit Attitudes toward Shyness

Across both Study 2 and Study 3, utilizing both lab-based and web-based versions of IAT, shyness was found to evoke a negative implicit attitude. These findings add to the literature demonstrating that shyness is negatively valued by emerging adults in Western cultures (e.g., Jones et al., 1986; Jones et al., 1982; Pilkonis, 1977). For example, Rapee and colleagues (2011) reported that shy individuals were rated as less likeable and as having weaker career prospects than their more sociable peers. These results might also help to explain why people tend to respond more negatively (e.g., rejection, victimized) to shy peers (e.g., Eastburg & Johnson, 1990). There is some evidence from previous studies indicating that implicit attitudes can sometimes be a better predictor of behaviours than explicit attitudes (Greenwald et al., 2009). Negative implicit attitudes about shyness

may contribute towards rejection (i.e., whispering behind a student's back) or social neglect (i.e., not receiving a party invite) in response to shy behaviours (Buhs et al., 2015; Rudasill & Rimm-Kaufman, 2009).

A strong negative implicit attitude about shyness is also in keeping with growing research across the lifespan indicating concurrent and predictive associations between shyness and a number of maladaptive adjustment outcomes, including internalizing problems (Coplan et al., 2014; Katz et al., 2011) and social difficulties (Newcomb et al., 1993; Rubin et al., 2006). For example, Nelson et al. (2008) found that as compared to their more sociable peers, shy emerging adults reported being more anxious and depressed, having lower levels of self-esteem, and experiencing poorer relationship quality with parents, best friends, and romantic partners. Thus, it seems plausible that such outcomes may lead individuals to form a more negative attitude toward shyness.

Moreover, from developmental and interactional perspectives, withdrawing from opportunities for social interaction (a typical behavioural characteristic of shy individuals, Rubin et al., 2009) may be viewed as particularly problematic during emerging adulthood, because it is contrary to the norms and expectations for social interaction and developing more mature friendships during this period (Closson, McVarnock, & Sanford, 2018; Rubin et al., 2006; Newcomb, 1990). Emerging adulthood is a unique life stage that involves the process of becoming an autonomous adult (Closson et al., 2018). For example, during the transition to university, emerging adults must adapt not only to a novel learning environment, but also to a new social setting (Arnett, 2015). University life can be also be particularly stressful for those students who move away from home for the first time, because this transition also reduces contact and support

from family and old friends (Noel, Levitz, & Saluri, 1985). Therefore, social skills, communication, or face to face interaction skills may prove to be particularly salient successfully adapting to these new environments and adjusting to university life (Eisenberg, 2009). However, shy, withdrawn, or avoidance behaviours often represent a lack of social skills. Moreover, withdrawing from peer interaction because of social evaluative concerns tends to be judged negatively by others (Creed & Funder, 1998; Gee, Antony, Koerner, & Aiken, 2012). For example, shy individuals are seen as fearful, self-pitying, and unassertive (Creed et al., 1998). Further, Jantaer, Hoover and Narloch (2006) found that shyness in university students was related to victimization. They further pointed out that shyness itself invites bullying. For example, shy individuals have a harder time initiating and continuing conversations (Pilkonis, 1977), speak less, and take a longer time to respond during conversations (Leary & Kowalski, 1995). It is therefore plausible that negative implicit attitude of shyness exists during this age period.

Implicit and Explicit Attitudes toward Shyness

Consistent across both Study 2 and Study 3 (and across both sets of methodologies), results showed that implicit attitudes about shyness were not significantly related to explicit attitudes. These results are contrary to hypotheses, but this lack of association has been reported in some previous studies (e.g., Blair, 2001; Dovidio et al., 2001; Gawronski et al., 2008; Goldstein et al., 2014). Taken together, these results support *Dual-Process Theory* (Gawronski et al., 2004), which suggests that individuals may simultaneously hold two types of cognition and introduces the possibility that they can conflict. Implicit attitude and explicit attitude are two independent systems.

Explicit attitudes involve thoughtful processes. For example, people can deliberately access past information about the target (e.g., shyness) in their memory and develop an evaluation (accept or not) about it. In contrast, implicit attitudes are a stable evaluation of such a target (e.g., shyness), stored in special fast-access memory (Koole, Dijksterhuis, & Van Knippenberg, 2001), and easily activated with little or no conscious effort. In this regard, explicit and implicit measures might be weakly correlated if people are motivated and able to control their responses on the explicit measure (e.g., Florack, Scarabis, & Bless, 2001b; Gawronski, Geschke, & Banse, 2003; Hofmann, Gschwendner, & Schmitt, 2005; Koole et al., 2001). Across both Study 2 and Study 3, students might have generally had a stable negative evaluation of shyness, which was easily activated from their memories when they saw the word “shyness” on the screen. However, after a more thoughtful evaluation of “shyness”, they might not have held such a negative attitude toward this construct. For example, they may think of their friend who is shy but still a good friend.

Notwithstanding, some methodological differences should also be taken into consideration. For example, methodological differences might reduce the relations between reaction time and self-report assessments (e.g., Hofmann et al., 2005; Kawakami et al., 2001; Wittenbrink et al., 1997). As well, the IAT assessed the automatic associations between shyness and positive or negative words, which tested individual’s emotional evaluation about shyness. However, the explicit test (self-report) tapped into participant’s cognitive evaluation about shyness (e.g., items such as, “do you think it is okay it is for people to have the following personality characteristics”).

Finally, according to the *Associative-propositional Evaluation Model* (Gawronski & Bodenhausen, 2006, 2007), implicit attitudes are the result of associative and propositional processes. When an individual is stimulated with a related target, it provokes an emotional reaction through an unconscious and automatic search of the existing information in his or her memory (associative process). In support of this assertion, results from previous studies have demonstrated that explicit-implicit correlations were higher when the self-report method involved more affective responses rather than cognitive responses (e.g., Hofmann et al., 2005a). Applied to the present findings, it is reasonable to argue that as compared to self-reported measures, IAT represents an affective rather than cognitive measure, which may have reduced the correlation between explicit and implicit attitude about shyness.

Implicit Attitudes and Self-Reported Shyness

Results from both Study 2 and Study 3 indicated that self-reported shyness was associated with less negative implicit attitudes about shyness. Of note, these results were evident across both protocols for assessing IAT (i.e., lab and web-based). Again, these findings support could be viewed as support for *Cognitive Dissonance Theory* (Festinger, 1957). Shy individuals may be especially likely to be more accepting of others' shy behaviors, which is similar to their own (e.g., *shared* motivations). Moreover, according to Wilson's et al., (2000) dual attitudes model, implicit attitudes reflect positive and negative associations accumulated through their own experiences (Dovidio et al., 2001; Petty et al., 2006; Rudman, 2004), and it can be activated automatically upon encounter of a relevant stimulus. Thus, compared with people who are more sociable, shy individuals experienced more rejection and victimization, which help them better

understand and more empathetic toward shy behavior. In contrast, non-shy individuals may be less likely to understand shy behaviours and thus have more negative implicit attitudes toward shyness than shy individuals. Indeed, as described earlier, Coplan et al. (2011) found that outgoing teachers rated shy children as being significantly less intelligent than their peers, whereas shy teachers reported no significant differences in intelligence.

However, contrary to the hypotheses and the findings from Study 1, results from Study 2 and 3 both indicated that emerging adults' own shyness was not related to their *explicit* attitudes toward shyness. It is plausible that this lack of significant association may be attributable to statistical and methodological issues. In Study 2, we used the same measure as we used in study 1 (*Normative Beliefs about Social Withdrawal Scale*) to test participants' explicit attitude toward shyness, but no significant result was found between people's self-report shyness and their explicit attitude. This might due to the small sample size in this study ($N = 66$), which reduced the statistical power of eliciting a relation. In Study 3, a new measure of normative beliefs about shyness was used to assess participants' explicit attitudes. Instead of describing shy behavior (vignette questions, e.g., "suppose John wants to hang out with other people, but is sometimes too nervous. Do you think it's OK for John to just watch others hang out?"), the previously identified synonyms and antonyms of shyness were used. Participants were asked to rate each of word based how much they accepted these words. Thus, it is possible that shy individuals are more likely to show empathetic toward shy behaviour using the vignette questions, as compared to evaluating to words.

Gender Effects

In terms of gender differences, results indicated that females held more positive beliefs (explicit attitudes) about shyness than males, but only in Study 3. According to the gender role stereotype theory, males are traditionally perceived as more dominant and females as more passive in Western cultures (Browne, 1998). Thus, it has been suggested that shyness might be more acceptable for girls than for boys because of the gender-stereotypes (Rubin et al., 2004). However, because of the inconsistent results across studies, these findings must be interpreted with caution.

Previous studies provide some evidence to support that compared to shy boys, shy girls are more likely to be accepted by teachers, parents or peers (e.g., Birnbaum et al., 1984; Coplan et al. 2004; Eggum et al. 2009; DuPaul et al. 2006; Stipek et al., 2008). For example, Garside et al., (2002) found that fathers tended to reward girls for expressing sadness and fear, but punished boys for expressing the same emotions. Kingsbury et al. (2012) also reported that parents' gender role attitudes might moderate their responses to shyness in boys versus girls. Similarly, compared to the shy girls, shy boy has been found to be more strongly associated with peer exclusion and rejection (Coplan et al., 2004, 2008; Spangler et al., 2009).

However, contrary to expectations, there were no significant gender difference in emerging adults' *implicit* attitudes about shyness. It is possible that both male and female hold negative attitude toward shyness. As discussed before, implicit attitude is a stable evaluation of a target (e.g., shyness), which is stored in special fast-access memory (Kooze et al., 2001), and is easily activated with little or no conscious effort. Thus, both female and male might activate negative affection when they are stimulated with the

word shyness. As well, across both samples, over seventy percent of participants were female, which may have also affected the results.

Limitations and Future Directions

This appears to be the first study to explore emerging adults' implicit attitude toward shyness in a Western culture. Despite the contribution of this study to the literature, there are some limitations that should be noted when interpreting the findings. First, as argued by Fazio et al. (2003), more evidence is needed to confirm the predictive validity of the IAT. This study only shows that people have a general negative implicit attitude toward shyness. However, there is still much to learn with regard to if, how, and under what circumstances, implicit attitudes may predict subsequent behaviours. Thus, future study should also measure people's actual behaviour toward shy individuals.

Second, as discussed before, the explicit measures (self-report test) tapped into participant's cognitive evaluation about shyness, which may have reduced the relation between implicit and explicit attitudes. Thus, in future studies, researchers should consider develop self-report method involved more affective responses rather than cognitive responses to test individuals' explicit attitude when compared with implicit attitude.

Study 4:

Implicit Attitudes toward Shyness in China

As discussed earlier, traditional Chinese culture is viewed as more collectivist, with social norms focusing on interdependence and maintaining harmony (Chen et al., 2005). As a result, social restraint is highly valued, and shy, quiet, and modest behaviours are perceived as socially mature. However, Chinese people have experienced a large cultural shift these years, from collectivist with social norms focusing on interdependence and maintaining harmony, to the one where social initiative and autonomy is increasingly accepted and valued. As a result, it appears as though shyness has become less acceptable as a behavioural characteristic (Liu et al., 2015; Wu et al., 2015).

Indirect assessments have previously been used to measure a wide range of implicit attitudes in Chinese culture, including views about gender, second-generation rich, recycling and recycling behaviour, and television cognition (Fu & Liu, 2017; Geng, Zhou, & Xu, 2013; Liu & Hu, 2009). For example, Hu, Abbasi, Wang, Zhou, Yang and Zhang (2017) used the *Implicit Association Test* (IAT) to assess Chinese students' implicit attitudes toward the second-generation rich. Results showed that although participants did not show a negative implicit attitude towards the second-generation rich, they did report more negative explicit attitudes. In another study using the IAT, Chinese students were found to have negative implicit attitudes toward people with disabilities (Ma, Chen, Zhou, & Zhang, 2012). However, a review of the literature revealed no previous studies that examined implicit attitudes about shyness as a trait in Chinese culture. Accordingly, the central goal of Study 3 was to explore individuals' implicit attitudes about shyness in Chinese culture.

Importantly for the proposed study, implicit attitudes are influenced by culture (Shepherd, 2011). For example, Gawronski et al. (2006) noted that implicit attitudes are normally derive from long-term socialization, whereas explicit attitudes are derive from recently experiences. Some researchers even argued that “understanding implicit cognition and automatic processes is an important aspect of understanding how culture works” (Shepherd, 2011 p.123). Thus, implicit attitudes are assumed to be acquired by people before explicit ones (Wilson et al., 2000).

For example, literature on prejudice suggests that people growing up in a racist family or cultural background were more likely to acquire negative stereotypes (Wilson et al., 2000). One study examined people’s attitude toward humor cross culturally (Chinese and Americans) (Jiang, Yue, & Lu, 2011). Results showed that, different from American students who hold a positive implicit attitude to humor, Chinese undergraduate students have a negative implicit attitude toward humor. But there was no significant difference between explicit attitudes (both of them showed positive attitude to human). The authors further argued that being humorous is incongruent with traditional Chinese culture (e.g., Confucian value focusing on behave formally, seriously, and to restrain laughter). Thus, even though Chinese people tend to report liking humor very much in recent years (Hao, Yue, Qi, & Lan, 2007; Yue, 2008), their implicit attitudes are still affected by traditionally Chinese culture. A similar effect was expected for shyness.

That is, it seems reasonable to expect that although ongoing economic and societal changes in China have impacted upon *explicit* attitudes about shyness, people’s implicit attitudes may still be deeply influenced by traditional Chinese culture. Thus, it is expected that people’s explicit and implicit attitudes will be disassociated with each

other. More specifically, it was predicted that, on an implicit level, Chinese students should show a more positive attitude towards shyness because of the traditional culture value (interdependence and maintaining harmony). In contrast, on an explicit level, they should hold a more negative evaluation of shyness as a consequence of culture shift.

Furthermore, similar to Study 2, the role of personality was also examined. As discussed before, individuals' own personality would affect their implicit attitude (Festinger, 1957). Thus, shy people may be especially more likely to accept others' shy behaviours which is similar to their own (e.g., shared motivations). Therefore, it was speculated that as compared with people who are more sociable, shy individuals might be more empathetic toward shy behavior and thus would perhaps respond more positively and hold more positive implicit attitude toward shyness.

Finally, people's attitude to the shy behaviour of different gender was tested. Previous studies have been suggested that shyness might be more acceptable for girls than for boys (Doey et al., 2014). Shy behavior might be more consistent with traditional female's gender roles. Thus, compared to males, females may more understand these social fear and anxiety and have more sympathy towards shy behavior. It would have a great influence on individuals' implicit attitude. Specifically, females would have more positive implicit attitude about shyness than males.

Hypotheses. Overall, it was expected that shyness would be perceived implicitly as more positive than negative. More specifically, it was predicted that reaction times would be shorter when synonyms of shyness were paired with positive words as compared to negative words on the screen together. Similarly, reaction times were

expected to be faster when antonyms of shy words (sociable) were paired with negative as compared to positive words.

A negative relation between implicit and explicit attitudes toward shyness was expected. Moreover, positive relations between individuals' own personality (shyness) and both their implicit and explicit attitudes toward shyness were expected. Finally, compared to female, male were expected to show more negative implicit attitude to shyness

Study 4: Pilot Study 1 - Generation and Evaluation of Target Stimuli

Similar to the first Pilot Study for Study 2, to implement an IAT study, the first step is to select the stimuli (exemplar words) that clearly represent both poles of the concepts (De Houwer, 2002). Different from the words to describe shyness in English, shy words in Mandarin are more complex. Thus, the aim of the present pilot study was to identify the words in Mandarin to describe shyness and non-shyness, positive and negative as well.

Researchers have argued that to understand the meaning of shyness in Chinese culture, we should not only consider it at the individual level (e.g., whether such behavior reflects fear or social anxiety) but should also understand it at the group level (e.g., the group functioning, whether such behavior prevents the individuals from standing out in the group) (Xu et al., 2008). Consequently, the Chinese notion of shyness is multidimensional because it also includes modest and unassuming behavior that seems to be particularly important for group functioning. For example, as described earlier, Xu and colleagues (2007, 2008) found both negative (“afraid to play with others”, “timid and fearful”) and positive (“behaves modestly”, “avoid conflict with peers”) descriptors of

shyness were provided by Chinese participants. As well, Xu et al.'s (2007) further suggested that the Chinese notion of shyness may include a form of regulated shyness that is expressed as non-assertive and unassuming behavior.

Different translations for the word shyness in Mandarin may yield different attitudes about shyness. For example, Chen et al. (1992) mentioned that shy, reticent, and quiet children are called "guai (乖)" in Mandarin, which means "good" or "well behaved." And it is expressed as non-assertive and unassuming behavior. Similarly, children who are sensitive and reticent are believed to be "dong shi (懂事)", "Ting hua (听话)" (understanding), which is a commonly used term for praising a child in China (Chen et al., 1992). Moreover, some words like "Mian tian (腼腆)" "Xiu se (羞涩)" are more positive when used to describe a shy girl. However, other words appear to be more negative, like "Hai xiu (害羞)" or "Xiu que (羞怯)" in Mandarin, which mean "afraid to talk to strangers" or "nervous". These words are more consistent with anxious shyness, and seems to capture shyness toward social evaluation (Chen & Gao, 2012).

Therefore, the purpose of this pilot study was to examine Chinese students' understanding of shyness and the words used to represent this construct. More specifically, the goal of this pilot study was to generate and evaluate synonyms and antonyms for shyness and valence terms (positive/negative) that would then be used in a subsequent IAT study of attitudes about shyness.

Study 4: Pilot Study - Method

Participants and Procedure

Participants were $N = 235$ undergraduate students (53 males; $M_{\text{age}} = 19.42$ years, $SD = .715$) enrolled in second year and third year psychology class (research method).

All participants were recruited from the East China Normal University, Shanghai, P. R. China. And all students were of Han nationality, a predominant ethnic group (over 90% of the population) in China. Study procedures were approved by the university Institutional Review Board. Upon obtaining consent, participants completed the word rating scale in their classroom. After that, they received course credit for participation.

Measures

Demographic information. Participants were asked to provide basic demographic information (see Study 2).

Word selection. An initial set of Mandarin words were selected based on previous relevant research (e.g., Chen et al., 1992; Chen et al., 2012) and by conducting informal focus groups with Chinese psychology faculty and graduate students with relevant content expertise for their understanding of the word “shy” in Mandarin. Emails were sent to 15 professionals who are expertise in shyness and Chinese culture. In each email, we asked their opinions about the word “shy” in Mandarin (e.g., what word do you think best describes "shyness" or "shy behaviour" in Mandarin?). The synonym and antonym of shyness were asked as well (e.g., what do you think is the closest synonym (i.e., the word with the same meaning) for the word “shy” in Mandarin? What do you think is the closest antonym (i.e., the word with the opposite meaning) for the word “shy” in Mandarin?). 11 professionals responded back and answered questions. All of the 11 professionals suggested the word “Hai xiu”(害羞) can best describes "shyness" or "shy behaviour" in Mandarin. Moreover, the word “Hai xiu”(害羞) in Mandarin mean “afraid to talk to strangers” or “nervous”, which is consistent with the definition of shyness, and seems to capture shyness toward social evaluation (Chen et al., 2012). Thus, we selected

“Hai xiu”(害羞) as the category word for Chinese version of IAT.

Several words were also selected to describe being shy (e.g., “Xiu que” (羞怯), “Mian tian” (腼腆)) and the words to describe the opposite of being shy (e.g., “Kai lang” (开朗), “Wai xiang” (外向)). After reviewing relevant literature of used in previous IAT tests in China (e.g., Fu et al., 2017; Geng et al., 2013; Hu et al., 2017), initial lists of positive words and negative words were also generated.

Word rating scale. As in Study 2 (but translated into Mandarin), participants were asked to suggest relevant synonyms and antonyms for shyness (e.g., “what do you think is the closest synonym (i.e., word with the same meaning) for the word Haixiu (害羞)”). Participants were then asked to rate each of these words based how well they represented a synonym or antonym of shyness (e.g., “for each of the following words, please indicate (by clicking on the appropriate response to what degree you think it represents a *synonym* (same meaning) for the word shy”). The same procedure was employed for the positive and negative words (e.g., “for each of the following words, please indicate (by clicking on the appropriate response) how much they reflect the attribute of positive). Ratings were made on a scale of 1 (not at all) to 5 (extremely scale) (see Appendix J).

Results – Study 4: Pilot Study

For *synonyms* of the word shy, 70 (29.5%) participants suggested the word “Miantian”(腼腆), 49 (20.7%) suggested “Xiuse”(羞涩), 38 (16%) suggested “Neixiang” (introverted, 内向), 16 (6.8%) suggested “Xiuqie”(羞怯), 15 (6.3%) suggested “Pasheng”(怕生), and 11 (4.6%) suggested “Danxiao”(胆小). Other words, such as

“Bugan”(不敢), “Neilian”(内敛), “Anjing” (安静) and “Zhangyang”(张扬) were generated by only a small number (< 10) of participants. The results from the words rating scale showed that the words “Miantian”(腼腆), Xiuqie”(羞怯), “Xiuse”(羞涩), “Danxiao”(胆小) and “Pasheng”(怕生) were rated as the most representative synonym for the word shy (see Table 15).

For *antonyms* of the word shy, 40 (16.9%) participants suggested “Waixiang” (extroverted, 外向), 33 (13.9 %) suggested “Dafang”(大方), 31 (13.1%) suggested “Shuanglang”(爽朗), 20 (8.4%) suggested “Huopo”(活泼), 19 (8.0 %) suggested “Zixin”(自信), 13 (5.5 %) suggested “Kaifang”(开放). The results from the words rating scale showed that the words “Dafang”(大方), “Shuanglang”(爽朗), “Kailang”(开朗), “Huopo”(活泼) and “Zixin” (自信) were rated as the most representative antonym for the word shy (see Table 16). From conceptual basis, the word “extroverted” was excluded because it is used to refer to a different trait in personality literature (Zelenski et al., 2014). The two sets of words did not differ significantly in word frequency, $t(8) = -1.24$, $p = .25$.

For the *positive* and *negative* words, the results from the words rating scale showed that the words “Kuaile”(快乐), “Yuyue”(愉悦), “Xingfu”(幸福), “You’ai”(有爱) and “Meihao”(美好) were rated as most reflective of the attribute of positive (see Table 17). In contrast, the words “Tuifei”(颓废), “Wuneng”(无能), “Juewang”(绝望), “Tongku”(痛苦) and “Jusang” (沮丧) were rated as most reflecting of the attribute negative (see Table 18). The two sets of words did not differ significantly in word

frequency, $t(8) = .422$, $p = .684$. Thus, these ten words (five positive words, five negative words) were selected for the IAT study.

Drawing upon the results of the pilot study, five positive words (“Kuaile”(快乐), “Yuyue”(愉悦), “Xingfu”(幸福), “You’ai”(有爱) and “Meihao”(美好)) words, five negative words (“Tuifei”(颓废), “Wuneng”(无能), “Juewang”(绝望), “Tongku”(痛苦) and “Jusang”(沮丧) words, five synonyms words of shy (“Miantian”(腼腆), “Xiuqie”(羞怯), “Xiuse”(羞涩), “Danxiao”(胆小) and “Pasheng”(怕生)), and five antonyms words of shy (“Dafang”(大方), “Shuanglang”(爽朗), “Kailang”(开朗), “Huopo”(活泼) and “Zixin”(自信)) were selected for the IAT.

Table 15

Descriptive Statistics of the Degree of Similarity Ratings for Synonyms of Shy

Words	Not at all	Slightly	Moderately	Very	Extremely	Mean	SD
Xiuqie 羞怯	3	56	60	97	19	3.30	.976
Danxiao 胆小	11	86	52	47	39	3.07	1.19
Miantian 腼腆	1	20	43	127	40	3.82	.849
Xiuse 羞涩	0	13	58	124	40	3.81	.778
Tuisuo 退缩	83	94	49	7	2	1.94	.870
Anjing 安静	92	84	48	10	1	1.91	.894
Neixiang 内向	26	71	65	56	18	2.87	1.13
Jushu 拘束	50	92	56	33	4	2.36	1.02
Pasheng 怕生	13	67	72	65	18	3.03	1.04
Jinchi 矜持	85	77	51	21	1	2.05	.988
Didiao 低调	156	47	24	8	0	1.51	.813
Hanxu 含蓄	69	81	57	25	1	2.18	.991
Danqie 胆怯	43	109	51	30	3	2.33	1.25
Jujin 拘谨	39	86	76	31	4	2.47	.877

Table 16

Descriptive Statistics of the Degree of Similarity Ratings for Antonyms of Shy

Words	Not at all	Slightly	Moderately	Very	Extremely	Mean	SD
Dafang大方	28	44	44	85	35	3.23	1.25
Waixiang外向	4	19	56	122	34	3.69	.877
Shuanglang爽朗	5	33	71	106	19	3.43	.906
Jiantan健谈	17	55	72	76	15	3.07	1.05
Haofang豪放	20	58	67	76	13	3.02	1.68
Kaifang开朗	41	55	62	63	15	2.81	1.19
Daqi大气	48	71	61	47	7	2.55	1.12
Zhangyang张扬	85	77	42	19	13	2.14	1.16
Xuanyao炫耀	158	55	15	6	1	1.46	.76
Jiao'ao骄傲	147	63	21	3	1	1.50	.75
Zihao自豪	107	78	39	8	3	1.82	.92
Zida自大	163	49	17	5	1	1.43	.76
Yonggan勇敢	38	63	72	56	6	2.70	1.08
Kailang开朗	13	19	60	105	38	3.58	1.03
Huopo活泼	12	19	58	115	32	3.58	.993
Zixin自信	20	38	64	93	20	3.23	1.09
Satuo洒脱	38	61	62	63	12	2.79	1.16

Table 17

Descriptive Statistics of the Degree of Similarity Ratings for Positive

Words	Not at all	Slightly	Moderately	Very	Extremely	Mean	SD
Meihao美好	1	1	50	82	101	4.20	.814
Chenggong成功	0	3	58	90	84	4.09	.807
Wanmei完美	3	12	51	78	91	4.03	.963
Kuaile快乐	0	1	16	74	144	4.75	1.08
Yuyue愉悦	0	1	22	87	126	4.43	.678
Shuxin舒心	2	3	63	90	76	4.00	.852
Youqu有趣	1	7	70	91	67	3.92	.856
Kaixin开心	0	2	33	98	103	4.28	.731
Fuyou富有	6	23	100	67	40	3.47	.969
Xingfu幸福	1	1	28	51	154	4.51	.753
You'ai有爱	0	2	26	81	127	4.41	.718

Table 18

Descriptive Statistics of the Degree of Similarity Ratings for Negative

Words	Not at all	Slightly	Moderately	Very	Extremely	Mean	SD
Wuneng 无能	4	8	34	75	114	4.22	.96
Shibai 失败	8	17	59	90	61	3.76	1.0
Beishang 悲伤	6	12	63	109	43	3.73	.91
Pinqiong 贫穷	14	47	81	61	31	3.33	.98
Shiwang 失望	5	11	58	119	41	3.77	.86
Cuiruo 脆弱	8	34	62	93	38	3.51	1.04
Tuifei 颓废	2	2	25	57	149	4.49	.79
Landuo 懒惰	8	33	75	65	54	3.53	1.1
Kuqi 哭泣	27	51	84	55	17	2.93	1.01
Tongku 痛苦	11	18	43	76	87	3.89	1.13
Juewang 绝望	4	6	10	26	188	4.66	.82
Jusang 沮丧	4	9	63	111	47	3.80	.87

Study 4 (Main Study):

Online-IAT Testing in Chinese Culture

Having developed and validated the necessary target words in the pilot study, the primary purpose of Study 4 was to explore implicit attitudes toward shyness among Chinese emerging adults. Given the literature previously reviewed, and results of Study 1, it was expected that explicit and implicit attitudes would not be significantly associated. Moreover, it was predicted that despite the results of Study 1 (where Chinese students displayed significantly more negative explicit attitudes toward shyness than Canadian students), Chinese students' implicit attitudes towards shyness would be positive overall, thought to still reflect traditional cultural values (e.g., interdependence, maintaining harmony). As well, positive relations were expected between participant personality (shyness) and both implicit and explicit attitudes toward shyness. Finally, compared to females, males were expected to demonstrate more negative implicit attitudes to shyness.

Study 4 - Method

Participants and Procedure

Participants were $N = 290$ undergraduate students (32 Males; $M_{age} = 20.3$ years, $SD = 1.97$) enrolled in second year psychology class (research method and introduction to statistics in psychology). All participants were recruited from the East China Normal University and Shanghai Normal University, Shanghai, P. R. China. All students in the sample were all of Han nationality, a predominant ethnic group (over 90% of the population) in China. Study procedures were approved by the university Institutional Review Board. Upon obtaining consent, participants started with the online Implicit

Association Test, followed by a series of self-report questionnaires about their background, personality, and beliefs about different personality characteristics and behaviours. All measures were collected using Qualtrics. After the experiment, participants receive course credit for participation. All participants received a comprehensive debrief (along with explaining the purpose of the study and providing contact information for appropriate resources pertinent to the material addressed in the study) upon completion.

Measures

Demographic information. Participants were asked to provide basic demographic information (see Pilot test).

Implicit Association Test. Participants were assigned randomly to one of four conditions that counterbalanced the order of category presentation (in Qualtrics, via a randomizer). Identical protocols were followed as in Study 3 (see *Figure 4*). The category labels and each example words are obtained from Pilot Study 4 (see Appendix L).

Beliefs about shyness. Participants completed Chinese version of the *Beliefs about Shyness Scale* (see Study 3). For each item, instead of describing shy behaviours, the synonyms and antonyms of shyness from Pilot Study 3 (i.e., the same words used for the IAT) were included. Participants were asked to rate each of word based on how much they accepted shyness. Participants rated the acceptability of each word on a 4-point Likert scale. A total score was expected to be computed with higher scores representing more normative (positive) beliefs about shyness (see Appendix K).

Participant shyness. Participants also completed the Chinese version of the *Revised Cheek and Buss Shyness Scale* (RCBS; see Study 1).

Overview of Data Analyses

IAT scoring. Following protocols for the improved scoring algorithm of IAT-D effects (Greenwald et al., 2003), trials exceeding 10,000 ms were removed. Participants were also excluded who had more than 10 percent of trials of less than 300 ms (10 participants were excluded). As well, error trials with block mean plus 600 ms were replaced (see Study 2).

Outliers on the IAT (i.e., D scores exceeding ± 3.5 standard deviations from the mean) were excluded from the analyses, consistent with outlier removal approaches used in other IAT research (Ratcliff, 1993; Tukey, 1977).

Preliminary analyses. Data were screened for potential errors in data entry and then examined for missing values. Examination of the data for univariate and multivariate outliers was conducted, followed by testing of assumptions, multicollinearity, and normality.

Factor analysis. The 6 items of the *Normative beliefs about Shyness and Sociability* scale has not previously been used in China. As such, an exploratory factor analysis was conducted in order to explore the factor structure of the measure. Same as in Study 3, additional 5 items from *Beliefs about Shyness Scale* representing the synonyms for sociability (non-shy) were included in the measure but only as filler items. The psychometric properties of the measure, such as, internal consistency reliability (Cronbach's α) were also assessed.

Correlational analyses and MANOVA. Bivariate correlations among all study variables were conducted, and main effects of gender were tested through a one-way MANOVA (with follow up univariate analyses using Bonferroni correction, where appropriate).

Sequence	No. Of trials	Task	Response key assignment	
			Left key	Right key
1	20	Practice	Shy	Non-shy
2	20	Practice	Positive	Negative
3	20	Practice	Shy, Positive	Non-shy, Negative
4	40	Test	Shy, Positive	Non-shy, Negative
5	40	Practice	Non-shy	Shy
6	20	Practice	Non-shy, Positive	Shy, Negative
7	40	Test	Non-shy, Positive	Shy, Negative

Figure 4. Implicit Association Tests for Shyness: Task Sequence

Study 4 – Results

IAT Scoring

An independent samples *t*-test was conducted to detect any significant differences in D scores ($M = -.85$, $SD = .38$) based on condition (i.e., order of pairings). A one-sample *t*-test was then conducted, as is typically used for the IAT (see Glashouwer et al., 2013), which yielded a significant result for the D score ($M = -.85$, $SD = .38$; $t(198) = -31.27$, $p < .001$, 95% confidence interval: $-.899$ to $-.792$). Cohen's $d = -2.22$. This indicated that participants were significantly faster for the Shyness/Negative and Sociable/Positive pairing than for other pairings. These findings are consistent with the hypothesis that individuals automatically associate shyness with negative words as opposed to positive words. The internal consistency of the IAT was assessed via a split-half procedure for the IAT (De Houwer et al., 2007), estimate = 0.81.

The S-W test for D score ($SW=.95$, $df = 198$, $p < .001$) suggested that normality was not reasonable assumption. However, this is expected in large (i.e., > 200) samples, and it is therefore recommended to rely on histograms and absolute values of skewness. The skewness (1.00) and kurtosis (1.86) statistics indicating substantial normality. The boxplot suggested a relatively positive distributional shape of the residuals. Moreover, examination of histogram suggested that all continuous variables had reasonably distinct tails and, as such, would likely not be dramatically improved by transformations (Kline, 2016).

Preliminary Analyses of Other Variables

Missing data. For all the variables, missing data rates ranging from 29.5% to 30.8%. Little's (1988) MCAR test was not significant, $\chi^2(246) = 248.729, p = .439$, suggesting that the pattern of missingness was not systematic.

Outliers. A combination of different procedures was used to detect outliers. The box plots were used, Box plots present the median, quartiles, and extreme values of the distribution of the variable. Moreover, according to Stevens (2002), the variables were z -transformed, and the cases with z -value > 3 are considered as outliers. Ten cases were identified as potential outliers.

Mahalanobis distance values were then examined in order to identify potential multivariate outliers in the dataset. Mahalanobis distance values greater than the corresponding critical χ^2 value (at $< .001$) were identified as potential multivariate outliers. Four cases were identified as potential multivariate outliers. Alteration or removal of such cases is generally not recommended, as they may be a true representation of the phenomenon being studied and are not likely to influence results when sample sizes are large. Indeed, deleting these cases did not significantly alter the pattern of results and, as such, these cases were retained.

Testing of assumptions. Assumptions of normality, linearity, and homoscedasticity was tested in the data. Examination of normal probability plots did not indicate any substantive departure from normality. However, several variables in the dataset met the criteria for being significantly skewed (i.e., z -scores > 1.96). And the results from omnibus test of multivariate normality shows that it is not normally distributed ($p < .001$). However, this is expected in large (i.e., > 200) samples, and it is therefore recommended to rely on histograms and absolute values of skewness, rather

than relying on z-scores (Kim, 2013). Examination of histograms suggested that all continuous variables had reasonably distinct tails and, as such, would likely not be dramatically improved by transformations. Moreover, none of the main study variables exceeded reference skew values (i.e., > 2) indicating substantial non-normality (range: $-.020, -1.98$). More importantly, some degree of non-normality was expected due the nature of the constructs being explored. At last, the MANOVA is known to be rather robust against violations of the normality assumption (Bortz, 1999; Stevens, 2002). Accordingly, transformations of the data were not conducted as it has been argued that transforming an inherently non-normal variable to force a normal distribution may have adverse implications (Kline, 2016).

Matrix Scatter plot is run to check the bivariate plot for departures from linearity. And the standardized residual plot is run to check the heteroscedasticity. Bivariate scatterplots of all predictor and outcome variables were examined to identify potential non-linear (i.e., quadratic) associations. No obvious curvature was apparent in all cases. Finally, plots of residual versus predicted values gave no major indication of heteroscedasticity, suggesting constancy of variance (i.e., homoscedasticity).

Beliefs about Shyness Scale

The 6 items of the *Normative Beliefs about Shyness Scale* were subjected to exploratory factor analyses (EFA). The scree plot suggested one component should be retained in the model. The Kaiser-Meyer-Olkin measure of sampling adequacy was $.89$, above the recommended value of $.6$, and Bartlett's test of sphericity was significant ($\chi^2(45) = 1446.88, p < .001$). The communalities were all above $.3$ (range from $.62$ -. 84), further confirming that each item shared some common variance with other items. There

is one component which eigen values greater than 1. It explains 48.97% of the variance (Eigenvalue = 4.89), The factor loadings from .83 to .92, Cronbach's $\alpha = .92$. Item loadings are presented in Table 20.

Correlational Analyses and MANOVAs

Descriptive statistics and bivariate correlations. Descriptive statistics and correlations for all main study variables are presented in Table 21. D scores were not significantly correlated with participants' explicit attitude about shyness ($r = -.02, p = .809$).

Gender differences. A MANOVA was performed to test for gender differences in Study 4 variables (implicit beliefs about shyness, explicit beliefs about shyness and sociability, participant shyness). No significant effects for Gender were found for beliefs about shyness ($F(1, 115) = .11, p = .744; M_{female} = 3.28, SD = .618, M_{male} = 3.24, SD = .70$), on D score ($F(1, 115) = 0.91, p = .343; M_{female} = -.84, SD = .37, M_{male} = -.93, SD = .34$), and participant shyness ($F(1, 115) = .45, p = .505; M_{female} = 2.88, SD = .62, M_{male} = 2.81, SD = .64$).

Table 19

Descriptive Statistics for Normative Beliefs about Shyness Scale

Items	Item content	M	SD
1	腼腆	3.46	.622
2	* 大方	3.88	.382
3	羞怯	3.28	.745
4	* 爽朗	3.84	.414
5	羞涩	3.41	.691
6	* 开朗	3.88	.364
7	胆小	3.08	.769
8	* 活泼	3.83	.410
9	害羞	3.78	.433
10	怕生	3.14	.809
11	* 自信	3.74	.540

Note. Scores range from 1 to 4; * filler items

Table 20

Item factor loadings for Beliefs about Shyness Scale in the Present Sample

Items	Item content	Factor
1	腼腆	.86
2	羞怯	.92
3	羞涩	.89
4	胆小	.83
5	怕生	.84
6	害羞	.88

Table 21

Inter-correlations among Study Variables

	1	2	3
1. D scores	-		
2. Participants' Shyness	.019	-	
3. Explicit attitude to shyness	-.022	.02	-
<i>Mean</i>	-0.844	2.87	3.28
<i>SD</i>	.38	.63	.63
<i>Min</i>	-1.51	1.44	1
<i>Max</i>	.875	4.83	4
<i>N</i>	198	195	205

Note. * $p < .05$; ** $p < .01$; *** $p < .001$

Study 4 – Discussion

The aim of Study 4 was to assess Chinese emerging adults' implicit and explicit attitudes using a revised measure of beliefs about shyness and a survey-based IAT. Contrary to hypotheses, results showed that emerging adults automatically associated shyness with negative words, and their implicit attitudes toward shyness were even more negative than in Canada. Again, consistent with previous findings (study 2 and study 3), implicit attitude was not significantly related to their explicit attitude. Gender difference was not found among any variables. This study contributes to the psychology literature by extending the validity of the IAT and the model of dual attitudes to a new cultural context.

Reliability of Web-based IAT-Shyness in Chinese culture

The results demonstrated the reliability of this survey-based IAT in Chinese culture. Specifically, internal consistency of present study was higher than the meta-analytic average (.79; Hofmann et al., 2005). As with the English version of the measure, results for the Mandarin measure have major implication for IAT studies. As mentioned earlier, this may allow researchers access larger samples more easily (Buhrmester et al., 2018). It also helps to avoid substantial costs and provides more control over design and simplifies data management (Paolacci et al., 2014). This will allow for a more extensive exploration of constructs using IAT in China, where it has been used less.

Implicit Attitudes toward Shyness

Contrary to initial hypotheses, but consistent with the results with explicit attitudes in Study 1, results from Study 4 demonstrated that emerging adults in Chinese culture have negative implicit attitudes toward shyness. Social roles and social norms can

have a strong influence on implicit attitudes formation (Karpinski et al., 2001). As discussed before, in traditional Chinese culture, social restraint is highly valued, and shy, quiet, and modest behaviours are perceived as socially mature. However, rapid and ongoing changes in China over the last 25 years appear to have resulted in drastic changes in the societal value placed upon shy behaviours in this cultural context (Chen et al., 2005). Chinese society has transitioned from a traditional hierarchical society to one where social initiative and autonomy is increasingly accepted and valued (Chen et al., 2005). Rapid social changes in urban China toward a market-oriented society may create a need for young people to focus on the self-expression (Chen et al., 2005). Therefore, shyness may have become incompatible with the social requirements and is no longer an adaptive trait in such society (Chen et al., 2006). In contrast, sociable students are more likely than others are to succeed in terms of being liked by peers, teachers and parents.

As well, 21st century children are characterized as being the generation that has had access to the internet from a very young age (Fass, 2003). They also tend to be very comfortable with technology as well as social media (Fass, 2003). As a result, compare to other generations, contemporary young adults have had more access to (and are thus likely more influenced by) foreign pop culture and Western values, such as assertiveness, and individualism (Chen et al., 2008; Nelson & Chen, 2007). Taken together, these influences may have made them more likely to develop negative attitudes toward shyness. Moreover, collective cultures emphasize group harmony and individual responsibility to the group, so following social norms is a core goal that guides each individual's attitude and behavior (Kim et al., 1999). Thus, Chinese people feel a strong sense of unity and are more likely to conform to the new cultural values instead of

individual preference. Taken together, these influences may have made them more likely to develop negative attitudes toward shyness.

Implicit and Explicit Attitude toward Shyness

Results again indicated no significant association between explicit and implicit attitudes toward shyness, which consistent with the results from Study 2 and Study 3. Again, the results are supported that implicit attitude and explicit attitude are two independent systems, which make unique contribution to peoples' behaviour (e.g., Florack et al., 2001; Gawronski et al., 2003; Gawronski et al., 2004; Hofmann et al., 2005; Koole et al., 2001).

Attitudes toward Shyness and Participants' Own Shyness

Contrary to findings from Study 1 to Study 3, the results from Study 4 indicated that Chinese emerging adults' own shyness was *not* significantly associated with explicit or implicit attitudes toward shyness. One possible explanation for this lack of effects could be due to cultural norms. In the West, independence and freedom of choice are more highly valued, and people are more encouraged to express their own thinking (Kim & Drolet, 2003). As a result, individuals' attitudes are personally driven by the individual, according to what he/she thinks is wrong. In contrast, in Chinese culture, being similar to others and conformity to a group is an important cultural value and the expression of one's individuality is discouraged (e.g., Markus and Kitayama, 1991). Thus, most Chinese people feel a strong sense of unity and are more likely to develop similar attitudes. Moreover, it has been claimed that the IAT measures familiarity with - or awareness of - cultural stereotypes, rather than personal animus (Arkes et al., 2004; Karpinski et al., 2001; Mitchell & Tetlock, 2017; Tetlock et al., 2009). Specifically,

researchers argued that “Cultural stereotypes may not be consciously endorsed, but their mere existence influences how information about an individual is processed and leads to unintended biases in decision making, so called “implicit bias”” (Chapman, Kaatz, & Carnes, 2013, p. 1504). Indeed, previous studies have consistently shown that culture shapes people’s implicit attitude (e.g., Cheon & Chiao, 2012; Gawronski & Bodenhausen, 2007; Strack & Deutsch, 2004). For example, Cheon et al. (2012) found that Asian Americans have stronger negative implicit attitudes toward mental illness, as compared to Caucasian Americans. Thus, it is possible that no matter how shy they are, Chinese individuals are more likely held negative attitude toward shyness, which is judged by society instead of individual.

As regards to the explicit attitude, the methodological issue should also be taken into consideration. As discussed in Study 3, we asked participants to rate each synonym and antonym of shyness based on how much they accepted each word. Thus, compared to using the vignette question in Study 1, shy individuals may be more likely to rationally evaluate these words, rather than emotional tendencies.

Limitations and Future Directions

Study 4 appears to be the first research to explore emerging adults’ implicit attitude toward shyness in Chinese culture. Thus, this study contributes to the psychology literature by extending the validity of the shyness- IAT and the model of dual attitudes to different culture context (Chinese culture). The results demonstrated that Chinese emerging adults have a negative implicit attitude toward shyness. Thus, with the increasing focus on developing intervention programs for shy people among non-Western countries, it is critical to understand people’s implicit attitude in modern Chinese society,

especially the implicit attitudes of parents and teachers. Despite the contribution of this study to the literature, there are some limitations that should be noted when interpreting the findings.

First of all, as discussed in Study 3, this study only shows that Chinese emerging adults have negative implicit attitude toward shyness. However, there is still much to learn under what circumstances, implicit attitudes may predict subsequent behaviours. Researchers should examine the predictive power of the IAT for avoiding behavior toward shy people. Such research could provide additional information for curbing negative attitudes toward shyness.

Another limitation is that the present study only assessed one specific type of shyness (i.e., “anxious” shyness). As discussed before, the perception and expression of shyness can be expected to vary in relation to a culture’s values and socialization goals. And researchers proposed a culturally-specific type of shyness that they labelled as regulated shyness (Xu et al., 2009). They further suggested that this specific type of shyness remains consistent with cultural values in China that promote the maintenance of social harmony (Wu, 1996). Thus, future research should also consider focusing on more culturally specific forms of shyness.

General Discussion

The primary goal of this dissertation research was to explore individuals' explicit and implicit toward shyness, using a variety of methodological approaches, and across samples of both Chinese and Canadian emerging adults. Although some similarities emerged across all three studies, each study also yielded some unique findings. When taken together, results from these four studies offer novel insights into people's attitudes toward shyness. In the sections that follow, an integrative perspective of the current findings is discussed within the context of the extant literature, along with a review of the broader implications, limitations, and directions for future research.

IAT-Shyness

With the create of the *Implicit Association Test* (IAT), Greenwald et al. (1998) radically innovated research on attitudes. Over the last decade, the IAT has become the most popular indirect measure of attitudes. The IAT is deemed to be a promising alternative, particularly for measuring attitudes participants may not be aware of, able to express, or willing to share with the researcher. A review of the literature did not reveal any previous studies of implicit attitudes toward shyness. Drawing upon the developmental and implicit cognitive perspectives, this dissertation research was the first to develop and validate an implicit measures of attitude about shyness, across different samples and across cultures.

Results across three studies (in lab study and online study) provided initial evidence of the reliability and some validity of the newly adapted IAT-Shyness. This measure displayed good psychometric properties, including internal consistency (from .81 to .92) higher than the meta-analytic average (.79; Hofmann et al., 2005) and reasonable error

rates (from 2% to 4%) (i.e., 5-10% for most IATs, see Rudman, 2011). In Canadian samples, results across in-lab and online studies for the IAT D-scores were nearly identical. Thus, the IAT-Shyness appears to be viable and valid, and thus opens the door for more extensive study of attitudes toward shyness in the future.

In addition, the results also demonstrated that the web-based IAT-shyness appears to be viable and valid. Which will allow for much more extensive and large-scale studies to be conducted in the future. For example, given that the IAT performs well online (Nosek et al., 2002), this may help push online research beyond self-report and allow for large, adequately powered tests of researchers' hypotheses in relatively shorter amounts of time. Moreover, the larger samples that are easier to collect allow for more power to test other effects (e.g., age, gender, individual differences).

It should be noted that IAT has also attracted criticism by researchers (e.g., Arkes et al., 2004; Blanton & Jaccard, 2006; Mitchell et al., 2017; Tetlock et al., 2009). The most common critiques are that the IAT's test-retest reliability is far too low for it to be safe to use in real-world settings (Bar-Anan et al., 2014; Gawronski et al., 2017). For example, Yoav Bar-Anan and Nosek (2014) reported a race IAT test-retest reliability only of 0.4 using a large sample. However, some researchers have argued that individuals' attitudes can - and do - change all the time and are influenced by contextual information (Fazio, 2007). In this regard, a lack of IAT's test-retest reliability may reflect an actual lack of stability of the construct itself. Thus, people's attitude toward shyness might also change. In addition, the psychometric properties of the standard IAT have been found to be superior to many other measures of implicit attitudes, including single-category IAT, personalized IAT, and pencil-and-paper IAT (Bar-Anan et al., 2014; Kurdi et al., 2018).

Future research should seek to assess the test-retest reliability of IAT-shyness – as well as the actual stability of implicit attitudes across time, contexts, and settings.

Researchers have also wondered about how large a role implicit bias plays in predicting actual behaviours, particularly as compared to other factors (Levy, Stroessner, & Dweck, 1998). Notwithstanding, there is empirical evidence of a reasonably strong links between IAT scores and subsequent behaviors (e.g., Schnabel, Banse, & Asendorpf, 2006; Swanson, Swansonm & Greenwald, 2001). For example, in a meta-analysis of 156 studies, Greenwald et al. (2009) found that implicit measures correlated significantly with direct measures of behaviours. In some cases, implicit attitude scores were found to be better predictors of individuals' behaviours as compared to explicit measures of the same attitudes. For example, Asendorpf et al. (2002) found that spontaneous expressions of shyness (e.g., facial adaptors, body adaptors, tense body posture) in individuals was better predicted by a shyness-oriented implicit test than by explicit self-ratings of shyness. However, as argued by Fazio et al. (2003), more evidence is needed to confirm the predictive validity of the IAT. The current findings only suggest that people have negative implicit attitudes toward shyness. However, there is still much to learn with regard to if, how, and under what circumstances, implicit attitudes may predict subsequent behaviours. Thus, future study should also measure people's actual behaviour toward shy individuals.

Taking together, IAT-Shyness appear to be viable and valid and make unique contribute to understand people's attitudes. Given that the IAT performs well online (Nosek et al., 2002), this may help push online research beyond self-report and allow for large, adequately powered tests of researchers' hypotheses in relatively short amounts of

time. Thus, IAT-Shyness should be integrated more fully into developmental or educational research in order to gain a more fine-grained understanding of how implicit attitudes relate to people's behaviours.

This dissertation research should be considered as a first step towards establishing the utility of this new measure. The psychometric properties of IAT-Shyness have only been established in samples of university students. However, people's age might have a significant effect on their attitude toward shyness, especially their implicit attitude. For example, older people are more likely to endorse traditional collectivistic values, which might affect their attitude toward shyness. Moreover, there might also be some differences in these findings as a function of geographical location in China. For example, participants from China's rural areas usually live under not so favorable circumstances compared to their urban-raised peers, have access to fewer educational resources, and are more likely to endorse more traditional collectivistic values, which can be seen in the more positive attitude toward shyness (Chen, Wang, & Cao, 2011). Thus, for a next step, this could be applied to several different domains in order to gain a better understanding of how implicit attitudes relate to people's behaviour. For example, IAT-Shyness could be applied to educational context. In some cases, teachers may not want to openly express their negative attitudes. Pit-ten Cate and Glock (2018) explored teachers' implicit and explicit attitudes toward students with differentially educated parents. The results indicated positive implicit attitudes but not explicit attitude toward students with highly educated parents. Similarly, Glock, Kneer, and Kovacs (2013) found that teachers' hold ambivalent implicit attitudes toward students with immigration backgrounds and positive implicit attitudes toward native students. They further pointed out that this

implicit evaluation might affect teachers' interactions with students in the classroom.

Thus, an IAT-Shyness may become a useful tool for researchers who want to obtain an unbiased measure of teachers' attitude toward child shyness.

Furthermore, parenting is also considered an important factor affecting the development of child shyness (Rubin et al., 1999). According to transactional models of development (e.g., Davidov et al., 2006; Rubin et al., 1991; Sameroff et al., 2003), there is a dynamic interplay over time among child characteristics (e.g., temperament) and features of the environment (e.g., relationships with important others, such as parents). Thus, IAT-Shyness could be used to test parents' implicit attitude toward shy children. It offers an opportunity to better understanding their parenting behaviour. As well, future interventions can try to facilitate the triggering of parents' positive implicit attitude toward the child shy behaviours, which in turn, may help reduce shy child's anxiety and fearfulness. For example, Foroni and Mayr (2005) suggested that vivid counterstereotypic scenarios can reduce people's implicit preferences. Indeed, researchers demonstrated that participants' racist were significantly reduced by reading an evocative story told in second-person narrative in which a White man assaults the participant and a Black man rescues the participant (Lai et al., 2016). Thus, we might try to facilitate the triggering of parents' positive implicit attitudes toward shyness by reminding them the positive advantages of being shy, such as more empathy and trustworthiness.

Finally, previous researchers working with young children have focused on explicit measures of attitudes, such as direct questioning and story-telling techniques. However, such techniques are problematic, because expressed attitudes can be influenced or limited by extraneous factors such as self-preservation biases and children's language ability

(Spence, 2005). Thus, IAT-Shyness could be an appropriate measure to test children's attitudes since it requires no oral response or comprehension of verbal material. Indeed, researchers investigated the applicability of the IAT to children, and was demonstrated the effective for very young children (e.g., Chequer, 2014). Therefore, IAT-shyness could also be used to test child's attitudes toward shyness.

Attitudes toward Shyness in Canada vs. China

We examined university students' implicit and explicit attitudes toward shyness in Canada and China across four studies. The results demonstrated that, overall university students in both Canada and China have negative implicit attitudes about shyness. It is reasonable that western emerging adults have negative attitude toward shyness, given that shyness is found concurrent and predictive associated with an amount of maladaptive adjustment outcomes, including internalizing problems (Coplan et al., 2014; Katz et al., 2011) and social difficulties (Newcomb et al., 1993; Rubin et al., 2006).

A strong negative attitude about shyness is also in keeping with growing research across the lifespan indicating shyness is now associated with negative outcomes in China (e.g., Coplan et al., 2016; Ding et al., 2014; Liu et al., 2015; Wu et al., 2015). For example, a recent study has found that children's shyness was associated greater internalizing problems, poorer academic achievement, and less peer preference (Coplan et al., 2017). Similarly, Liu et al. (2014) examined the short-term longitudinal associations between shyness and adjustment outcomes among Chinese children. Their results indicated that children's shyness was significantly and negatively related to peer preference, self-perceptions and academic achievements and positively related to the indices of maladjustment at both time points. Liu et al. (2017) also recently reported that

shyness was related to adjustment problems in children and adolescents and it tended to be associated with social and psychological problems more strongly in adolescence in China. Thus, it seems plausible that such outcomes may lead individuals to form a more negative attitude toward shyness.

The present findings do not bode well for shy individuals in both Canada and China. Such negative implicit and explicit attitudes are likely to create an unsupportive environment for shy individuals, which further makes life more difficult for them in both cultures. Especially for China, shyness no longer appears to evoke positive and supportive responses from others, which may in turn help to account for the adjustment difficulties that shy individuals now appear to face in China.

Moreover, although we cannot compare them directly, but the results inferred from D scores suggest that these implicit attitudes are even *more* negative in China; Further support for this idea comes from a direct comparison of explicit attitudes, which did indeed indicate that Chinese participants had more negative normative beliefs about China than Canadian. Researchers suggested that attitudes toward shyness are affected by culture and social change (Chen, 2010). As discussed before, China has witnessed rapid economic growth as well as social transformation. Since 1978, various economic, social, and cultural forces have concertededly reshaped the social realities of contemporary China. The transition from a communist economy to a market economy results in a critical reevaluation of traditional values.

According to Dawson's Traditional-Modern (T-M) theory of attitudes change, the susceptibility to traditional-modern attitude change is determined by (a) the amount and the type of contact with modern attitudes; (b) the cultural importance and attitude

topic; (c) the presence or absence of centralized, indigenous authority systems; (d) the degree of severity of childhood socialization; and (e) individual tolerance for cognitive inconsistency. Some studies have been found supported T-M theory. For example, Hyun (2001) reported that highly educated Koreans and those greatly exposed to a complex urban life are more likely to develop an individualistic orientation and to have less traditional values.

As the participants in present studies are all university students from urban China, which is a demographic group bear unique social significance in the Chinese context, revealing insightful information about the processual mechanisms of social attitudes. The current generation of university students grew up in a time when Chinese society has already changed to social initiative and autonomy is increasingly accepted and valued (Chen et al., 2005). Thus, they have more chance to access and contact with modern attitudes (Chen et al., 2008; Nelson et al., 2007), given that they tend to be very comfortable with technology as well as social media (Fass, 2003).

Moreover, they might learn from their experience that sociable students are more likely than others are to succeed in terms of being liked by peers, teachers and getting better job opportunities (Kan, 2013). As the participants in the Chinese studies were born in the late 1990s and early 2000s, given the social changes in China recent years, they are more likely to develop negative attitude toward shyness, as compared to other generation. From an early age, 21st Chinese children in urban centers may be aware that parents' and teachers' respond negatively to shy behaviour. For example, Cheah et al. (2004) found that Chinese mothers regarded socially withdrawn behaviours in their children negatively. Similarly, Chinese teachers do perceive shyness as potentially problematic

behaviour in the classroom (Li et al., 2016). Moreover, peers also dislike shy children. For example, Liu et al. (2014) reported that children's shyness was significantly and negatively predictive of peer preference in China. As well, Zhang et al. (2018) recently reported that shyness was positively associated with perceived peer exclusion in a sample of Chinese early adolescents. Therefore, growing up from birth in this macro-environment, students in the current Chinese samples may have been more likely to develop negative implicit attitude toward shyness by observing the people around them.

At last, as the culture changed, many Chinese schools and universities have set the goals of education to help students to successfully adapt in a competitive society (Zhou & Reed, 2005). In fact, as the culture changed, many Chinese schools and universities have set the goals of education to help students to successfully adapt in a competitive society (Zhou et al., 2005). For example, they started to encourage students to express their personal opinions, and focus more on student's self-direction, and self-confidence (Chen et al., 2018). Therefore, in such macro-environment, students have more opportunities to contact with modern attitudes. In turn, they may be more likely to develop negative attitude toward shyness. Therefore, based on the Traditional-Modern (T-M) theory of attitudes change, it is not surprising that students in urban China hold negative attitude toward shyness.

It is also possible that contemporary Chinese people consider shyness as a mental disorder. Researcher suggested that people's knowledge about mental health affect their attitude toward mental disorders (Jorm et al., 1997). In Canada, counselling and mental health services are well developed. Thus, the public understands shyness very well. And there are a lot of therapy programs are aimed to help shy individuals. As a result, people

in Western cultures might tolerate shy behaviour. However, in China, psychological counseling and mental health problems are relatively recent concepts, having only emerged around 35 years ago. Thus, mental health and intervention or therapy are likely to be unfamiliar to many Chinese people (Gao & Michael, 2001; Sue & Chu, 2003). For example, several studies have found Chinese people to have poorer depression literacy than other cultural groups, such as Australians and Canadians (Wong, Xuesong, Poon, & Lam, 2012; Tieu, Konnert, & Wang, 2010). Moreover, most of Chinese people believe that mental disorder have genetic rather than social origins. Thus, people's attitudes towards the mentally ill are connected with shame and negative feelings in Chinese cultures (Ahn & Elizabeth, 1980). Indeed, both qualitative and quantitative studies have reported that Chinese societies possess a negative attitude toward mental disorders (e.g., Schomerus, Matschinger, & Angermeyer, 2013; Tang, 2015; Yang, Yu, & Zhang, 2013). For example, Chen, Lai, and Yang (2013) found that people with mental illnesses are being perceived as dangerous, and their families are being devalued in Chinese culture. Similarly, a cross-sectional study showed that 30-40% of the respondents believed that that mental health center was inappropriate to locate near housing estates (Wong et al., 2012). Although shyness is not a mental disorder, it does share similarity with social anxiety disorder, and it is associated with internalizing problems (e.g., depression and loneliness) in modern Chinese society. Thus, it is possible that Chinese students consider shyness as a mental disorder. The lack of relevant knowledge and culture norms about mental health sway people's attitude toward shyness in the opposite direction. Indeed, Cheon et al. (2012) reported that as compared to Caucasian Americans, Asian Americans show stronger implicit mental illness stigma. They further suggested that suggest that

cultural differences in the meanings associated with mental illness may underlie cultural variations in stigma.

Attitudes toward Shyness and Participants' Own Shyness

Moreover, participants' self-report shyness was related to their implicit attitudes and explicit attitudes (some mixed findings here, see Study 1 and Study 3) toward shyness. Specifically, shy behaviours were viewed as most acceptable by those who rated themselves as high in shyness. It supports the idea that if individuals understand shyness well, they may be more sympathetic toward shy people because they understand why they behave the way they do. The results also support that, in the Western country, independence and freedom of choice are highly valued. People are encouraged to express their thinking (Kim et al., 2003). As a result, individuals' attitudes are personally driven by the individual. It should be noted that the effect sizes of correlation were small to medium, so it is possible that other factors might affect people's implicit attitude toward shyness.

However, Chinese participants self-reported shyness were not related to their attitude toward shyness. The results support that most Chinese people feel a strong sense of unity and are more likely to develop the similar attitudes. Thus, it is possible that no matter how shy the individuals are, Chinese individuals are more likely held negative attitude toward shyness, which is judged by society instead of individual.

Gender Differences

In terms of gender difference, contrary to initial expectations (but consistent across four studies), the results indicated no significant gender difference in both Canadian and Chinese emerging adults' implicit or explicit attitudes (except for Study 3)

toward shyness. It is possible that both male and female hold negative attitude toward shyness. Shyness is concurrently and predictively associated with a number of maladaptive adjustment outcomes in both Canada and contemporary China. In addition, withdrawal behaviour from social interaction may be viewed as highly problematic during emerging adulthood. Thus, both female and male at this age might have negative attitude toward shyness.

Moreover, as discussed before, implicit attitudes are a stable evaluation of a target (e.g., shyness), stored in special fast-access memory (Koole et al., 2001), and easily activated with little or no conscious effort. Thus, both female and male might activate negative affect when they are stimulated with the word shyness. It should be noted that over seventy percent of participants are female among three studies (Study 2, 3 and 4), which may affect the results. Future studies should include more male participants in order to explore gender difference.

General Limitations and Future Directions

The current program of research addressed a number of important gaps in the literature by exploring emerging adults' explicit and implicit attitude toward shyness in two cultures. Nevertheless, there are a number of limitations that must be acknowledged, with an eye towards future directions.

First of all, as mentioned before, because we did not include a measure of behavioral intentions, it is unclear whether people's attitude had a direct or an indirect influence on behavior. The MODE model (Fazio, 1990; Fazio et al., 1999) provides a theoretical framework on how individuals' attitudes predict their behavior. The model postulates two separate pathways by which they guide behavior: an automatic path through which

implicit attitudes guide automatic behavior and a controlled path through which explicit attitudes guide controlled behavior. Although we found that people's implicit attitude toward shyness were not related to their explicit attitude, it is still not clear, on the basis of the current work alone, how do these two attitudes contribute to individuals' behaviour toward shyness.

Next, although shyness may pose unique challenges to university students, future researchers should include non-university emerging adults who may differ in their beliefs about withdrawal due to different life circumstances (e.g., living alone, entering the workforce). Furthermore, our sample derived of children from urban regions of China. There appear to be some differences in these findings as a function of geographical location in China. Families in rural areas in China endorse more traditional collectivistic values, which can be seen in the more negative outcomes related to children's shyness (Chen et al., 2011). For example, participants from China's rural areas usually live under not so favorable circumstances compared to their urban-raised peers, have access to fewer educational resources, and are more likely to endorse more traditional collectivistic values, which can be seen in the more positive attitude toward shyness (Chen et al., 2011). Therefore, the results cannot be generalized to other regions of China.

Moreover, as discussed in Study 2, IAT is a relative or compared measure of evaluation (e.g., shyness vs. non-shyness). For example, in Study 3, the IAT contrasted shyness with "non-shyness". Accordingly, respondents' reaction times to categorizing shyness might be extracted from the two conditions in an effort to measure positive for shyness irrespective of the evaluations of non-shyness. Thus, it could not be used to explore individual's *absolute* implicit attitude to shyness. Some researchers have

developed a single category IAT to measure one concept (Wigboldus, 2004). In this version of the IAT, only three categories are used instead of four (one target concept and two attribute concepts). This protocol provides an opportunity to explore individuals' absolute implicit attitude to shyness. Future study could also consider other implicit measures, which may provide flexibility, including the *Go/No-go Association Task* (Nosek et al., 2001) and the *Extrinsic Affective Simon Task* (De Houwer, 2003). The psychometric properties of these new measures are not as well understood as the IAT, so their usefulness as measurement methods remains to be determined.

Furthermore, because IAT has attracted criticism by researchers (e.g., Arkes et al., 2004; Tetlock et al., 2009). For example, De Houwer et al. (2007) pointed out that IAT can be faked under certain conditions (e.g., participants can slow down or speed up on the combined block). And Oswald et al., (2013) reported that correlation between IAT scores and discriminatory behavior is weak. Thus, future study could also consider the previously listed other implicit measures to explore people's attitude toward shyness.

Another limitation is that our study aims assessed people's attitude toward shyness, but for some items we used in questionnaires or words were used in IAT-shyness might remind participants of other different subtypes of social withdrawal. For example, NOBSWS's item 2 ("Do you think it's OK for John to spend time alone?") might tap into participant's evaluation about unsociability, which refers to a non-fearful preference for solitary activities (Asendorpf, 1990). In Western cultures, unsociability appears to be a benign form of social withdrawal (for a recent review, see Coplan, Ooi, & Baldwin, 2019). In contrast, in Chinese cultural context, unsociability is perceived as anti-collective, selfish, and abnormal (Chen, 2009). Thus, people usually have negative

attitude toward it. Moreover, the word “腼腆 (mian tian)” might tap into participant’s evaluation about regulated shyness which is expressed as nonassertive and unassuming behavior and perceived as more positive when used to describe a girl. Therefore, the different words we used might affect our results. It will be important for future studies to carefully choose words when testing peoples’ attitude toward shyness. It also will be important for future studies to explore peoples’ attitude toward other subtypes of social withdrawal (e.g., uncociability, avoidance, regulated shyness) in order to gain a more global understanding of social withdrawal.

At last, in this study, we only compared emerging adults’ attitudes toward shyness between two cultures (Canadian and Chinese). Again, cultural values play an important role in determining the meanings of shyness and shaping individuals’ attitudes toward it (Chen 2018). In some group-oriented countries, it is still crucial for individuals to behave restraint in certain culture context (Heinrichs et al., 2006). Thus, shy and socially withdrawn behaviours might be still perceived as appropriate and should be maintained. For example, Rapee et al. (2011) found in studies using hypothetical vignettes that youth in South Korea were more accepting of shy behavior than youth in Western countries. Furthermore, Heinrichs et al. (2006) found that participants from Japan, Spain and Korea are more positive toward socially withdrawn behaviors than participants from individualistic countries such as USA, Australia, Canada, Netherlands and Germany. Thus, future study should explore people’s attitude toward shyness in other countries, especially for collectivist countries.

Concluding Remarks

Several important contributions to the literature were made. To begin, the current research adds to the extremely limited body of research exploring emerging adults' attitude toward shyness. In particular, Study 1 was the first to empirically compare university students' normative belief about shyness among Canada and China addressing a clear gap in the shyness literature.

The current research was also the first to explore emerging adults' implicit attitude toward shyness, which explored an area that is grossly lacking in empirical attention. Across Study 2 to Study 4, utilizing both lab-based and web-based versions of IAT, shyness was found to evoke a negative implicit attitude in both cultures. Importantly, these studies were the first to provide empirical evidence that shyness is less acceptable by emerging adults in contemporary China, as compare to Canadian emerging adults. Exploring attitude toward shyness may have practical implications for future intervention program. For example, future interventions can try to facilitate the triggering of people's positive attitudes toward the shy behaviours, and create a more tolerant and supportive community for shy individuals, which in turn, may help reduce shy people's anxiety and fearfulness.

Another important contribution of this research was the development of a new measure of explicit attitudes toward shyness, the *Beliefs about Shyness Scale* (BSS, based on the words used for the IAT-Shyness). The results from Study 3 and Study 4 revealed that this new scale was internally reliable and had sound validity in both cultures. Thus, future studies could use this newly created scale to compare people's implicit and explicit attitude directly.

Taken together, these findings provide preliminary evidence to suggest that shyness is actually now viewed more *negatively* by emerging adults in China as compared to Canada. As well, across both cultures, shy behaviors were viewed as more acceptable by those who rated themselves as higher in shyness. Notwithstanding these contributions, it is clear that there remains considerable work to be done in order to obtain a clear understanding of people's attitude toward certain personality. The current research provides the groundwork for future exploration of individual's both implicit and explicit attitudes toward shyness.

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Appendixes

Appendix A

Demographics

Gender: _____

How old are you? _____

Year in University: _____

Please indicate your ethnicity (check one):

White/Caucasian _____

Black _____

Arabic _____

Hispanic or Latino _____

Native American _____

South Asian (e.g., Indian, Pakistani) _____

North-East Asian (e.g., Japanese, Chinese, Korean) _____

Other: (please specify) _____

Demographics in Mandarin 背景信息

性别: 1. 男 1. 女

出生年月日: _____年____月____日

年级: _____

种族:

白种人:

黑人

阿拉伯人

西班牙裔或拉丁裔

印第安人

南亚(如印度、巴基斯坦)

东北亚(如日本、中国、韩国)

其他 (请注明):

.

Appendix B

The Normative Beliefs about Social Withdrawal Scale

Instructions: The following questions ask you about whether you think certain behaviours are WRONG or are OK. Circle the answer that best describes what you think. Circle ONE and only one answer.

Response Choices: 1= "It's really wrong", 2= "It's sort of wrong", 3= "It's sort of okay", 4= "It's perfectly okay"

***Suppose John wants to hang out with other people, but is sometimes too nervous.**

- 1) Do you think it's OK for John to just watch others hang out? 1 2 3 4
 2) Do you think it's OK for John to spend time alone? 1 2 3 4

Suppose Mary doesn't have a strong preference to be with other people or to be alone. She likes to work by herself (e.g., reading, working in the computer) and is not nervous or worried, but also doesn't mind being with other people.

- 3) Do you think it's OK for Mary to work alone? 1 2 3 4
 4) Do you think it's OK for Mary to spend time alone? 1 2 3 4

Suppose Phillip does not like being with other people. When given a choice, Phillip always chooses to work alone and is the happiest when he is away from other people.

- 5) Do you think it's OK for Philip to avoid other people? 1 2 3 4
 6) Do you think it's OK for Philip to spend time alone? 1 2 3 4

***Suppose Becca wants to hang out with other people, but is sometimes too nervous.**

- 7) Do you think it's WRONG for Becca to just watch others hang out? 1 2 3 4
 8) Do you think it's WRONG for Becca to spend time alone? 1 2 3 4

Suppose Matt doesn't have a strong preference to be with other people or to be alone. He likes to work by himself (e.g., reading, working in the computer) and is not nervous or worried, but also doesn't mind being with other people.

- 9) Do you think it's WRONG for Matt to work alone? 1 2 3 4
 10) Do you think it's WRONG for Matt to spend time alone? 1 2 3 4

Suppose Zoe does not like being with other people. When given a choice, Zoe always chooses to work alone and is the happiest when she is away from other people.

- 11) Do you think it's WRONG for Zoe to avoid other people? 1 2 3 4
 12) Do you think it's WRONG for Zoe to spend time alone? 1 2 3 4

***13) In general, it is WRONG to avoid others due to nervousness.** 1 2 3 4

- 14) If you like to working on activities alone, it is OK to not hang out with others.
 1 2 3 4

- 15) In general, it is OK to spend time alone if you don't like being with others.
 1 2 3 4

***16) It is usually OK to turn down chances to talk and be with other people because you feel too shy.**

- 17) It is WRONG to not have a preference for being with others or being alone.
 1 2 3 4

- 18) It is WRONG to not like others and to prefer to be alone. 1 2 3 4

Appendix C

The Revised Cheek and Buss Shyness Scale

Some individuals sometimes feel nervous or shy, whereas other individuals do not. Choose the answer that describes you best. There are no right or wrong answers. Just circle the number that is like you most of the time.

	0	1	2	3	4
	Not at all	Hardly ever true	Sometimes true	True most of true	Always the time true
1. I am socially somewhat awkward.	0	1	2	3	4
2. I like to be with people.	0	1	2	3	4
3. I don't find it hard to talk to strangers.	0	1	2	3	4
4. I welcome the opportunity to mix socially with people.	0	1	2	3	4
5. I feel tense when I'm with people I don't know well.	0	1	2	3	4
6. I prefer working with others rather than alone.	0	1	2	3	4
7. I have no doubts about my social competence (or how well I do socially).	0	1	2	3	4
8. I find people more stimulating than anything else.	0	1	2	3	4
9. I feel nervous when speaking to someone in authority.	0	1	2	3	4
10. I'd be unhappy if I were prevented from making many social contacts.	0	1	2	3	4
11. I am often uncomfortable at parties and other social functions.	0	1	2	3	4
12. I feel inhibited in social situations.	0	1	2	3	4
13. I have trouble looking someone right in the eye.	0	1	2	3	4
14. I am more shy with members of the opposite gender.	0	1	2	3	4
15. I do not find it difficult to ask other people for information.	0	1	2	3	4
16. When in a group of people, I have trouble thinking of the right things to talk about.	0	1	2	3	4
17. It does not take me long to overcome my shyness in new situations.	0	1	2	3	4
18. It is hard for me to act natural when I am meeting new people.	0	1	2	3	4

Appendix D

Words Rating Scale 1

1. What do you think is the closest *synonym* (i.e., word with the same meaning) for the word **shy**? _____

2. For each of the following words, please indicate (by clicking on the appropriate response) to what degree you think it represents a *synonym* (same meaning) for the word **shy**.

Words	Not at all	Slightly	Moderately	Very	Extremely
Timid					
Coy					
Bashful					
Self-Conscious					
Reserved					
Sensitive					
Quiet					

3. What do you think is the closest *antonym* (i.e., word with the opposite meaning) for the word **shy**? _____

4. For each of the following words, please indicate (by clicking on the appropriate response) to what degree you think it represents an *antonym* (opposite meaning) for the word **shy**.

5. For each of the following words, please indicate (by clicking on the appropriate response) how much they reflect the attribute of **positive**.

Words	Not at all	Slightly	Moderately	Very	Extremely
Competent					
Success					
Perfect					
Loving					
Magnificent					
Fantastic					
Pleasant					
Fun					
Happy					
Amazing					
Awesome					
Delightful					

6. For each of the following words, please indicate (my clicking on the appropriate response) how much they reflect attribute of **negative**.

	Not at all	Slightly	Moderately	Very	Extremely
Incompetent					
Failure					
Disgusting					
Useless					
Dismal					
Terrible					
Annoying					
Horrible					
Bad					
Sad					
Sorrow					
Upset					

Appendix E

Words Rating Scale 2

1. For each of the following words, please indicate (my clicking on the appropriate response) to what degree you think it represents a *synonym* (same meaning) for the word

Words	Not at all	Slightly	Moderately	Very	Extremely
Timid					
Coy					
Bashful					
Self-Conscious					
Reserved					
Sensitive					
Quiet					
Introverted					
Nervous					
Afraid					
Anxious					
Cautious					
Hesitant					
Insecure					

shy.

2. For each of the following words, please indicate (my clicking on the appropriate response) to what degree you think it represents an *antonym* (opposite meaning) for the word **shy**.

Words	Not at all	Slightly	Moderately	Very	Extremely
Outgoing					
Bold					
Talkative					
Gregarious					
Open					
Confident					
Extrovert					
Loud					

Appendix F

Implicit Association Test-Shyness

Implicit association test procedure involves a series of seven tasks. In each task, participants will be asked to categorize stimuli into two categories. For example, participant will be presented with a computer screen on which the word "Shy" appears in the top left-hand corner and the word "Non-Shy" appears in the top right-hand corner. In the middle of the screen a word, such as hesitant, that is typically associated with either the categories of "Shy" or "Non-shy". For each word that appears in the middle of the screen, participant is asked to sort the word into the appropriate category by pressing the "E" or "I" key. The reaction time will be recorded. These are the four groups and the items that belong to each:

Category	Items
Shy	Timid, Reserved, Quiet, Self-Conscious, Hesitant
Non-Shy	Sociable, Outgoing, Bold, Talkative, Loud
Positive	Success, Loving, Happy, Awesome, Delightful
Negative	Failure, Useless, Terrible, Horrible, Bad

Appendix G

The Beliefs Shyness Scale

Instructions: For the following items, please indicate how “wrong” vs. “ok” it is for people to have the following personality characteristics.

Response Choices: 1= “It’s really wrong”, 2= “It’s sort of wrong”, 3= “It’s sort of okay”, 4= “It’s perfectly okay”

	really wrong	sort of wrong	sort of OK	perfectly OK
Shy	1	2	3	4
Timid	1	2	3	4
Sociable	1	2	3	4
Reserved	1	2	3	4
Outgoing	1	2	3	4
Quiet	1	2	3	4
Bold	1	2	3	4
Talkative	1	2	3	4
Self-Conscious	1	2	3	4
Loud	1	2	3	4
Hesitant	1	2	3	4

Appendix H

Cheek & Buss Scale in Mandarin

羞怯量表

有些人有时候会感到紧张或害羞，然而其他人则不会。请选择下列最符合你的描述。该问卷并没有正确 或错误的回答。请标出最符合你平时状态的数字

	0	1	2	3	4
	完全不符合	几乎不符合	有时符合	大多符合	完全符合
1. 我在社交场合里感到尴尬。	0	1	2	3	4
2. 我喜欢与别人一起。	0	1	2	3	4
3. 我不觉得与陌生人谈话有什么困难。	0	1	2	3	4
4. 我很欢迎能给我参与到与人交往的机会。	0	1	2	3	4
5. 与不熟悉的人在一起我感到紧张。	0	1	2	3	4
6. 我宁愿与别人一起工作而不是独自一人工作。	0	1	2	3	4
7. 我对我的社交能力毫不质疑。	0	1	2	3	4
8. 我发现与人交往比其他任何事情都刺激。	0	1	2	3	4
9. 在与有权威的人谈话时，我感到紧张。	0	1	2	3	4
10. 不让我与别人有社会交往时我会不开心。	0	1	2	3	4
11. 我在聚会或其他社交活动中经常感到不自在。	0	1	2	3	4
12. 我在社交场合里感到很受限制。	0	1	2	3	4
13. 我与别人有眼神接触困难。	0	1	2	3	4
14. 我在与异性交往时更加羞怯。	0	1	2	3	4
15. 对向别人打听些事情我不觉得困难。	0	1	2	3	4
16. 当处于一群人之中时，我很难找到合适的交谈话题。	0	1	2	3	4
17. 我并不需要用很长的时间来克服我在新环境里的羞怯。	0	1	2	3	4
18. 在与生人在一起时，我很难表现得自然。	0	1	2	3	4

- 9) 你认为小李一个人工作是? 1 2 3 4
- 10) 你认为小李一个人独处是? 1 2 3 4

设想一下，小梅不喜欢与他人在一起。如果可以选择，小梅总是选择一个人工作，而且远离他人小梅感到很开心。

- 11) 你认为小梅避免与他人交流是? 1 2 3 4
- 12) 你认为小梅一个人独处是? 1 2 3 4
- *13) 总体来说，因为紧张焦虑而避免与他人接触是? 1 2 3 4**
- 14) 如果活动的时候你喜欢一个人，那么不与他人一起出去是? 1 2 3 4
- 15) 一般来讲，如果你不喜欢和他人相处而选择一个人独处是 1 2 3 4
- *16) 通常，因为你感到特别害羞而减少与他人交谈或接触的次数是 1 2 3 4**
- 17) 对于与他人相处 或是独处都无所谓。 1 2 3 4
- 18) 不喜欢他人和偏爱独处是? 1 2 3 4

Appendix J

Words Rating Scale in Mandarin

1. 你认为**害羞** (shyness) 的近义词是什么_____?
2. 对于下面的每一个词语, 请选择一个你认为最符合**害羞** (shyness) 近义词的程度。

词汇	完全无关	有一些接近	中等接近	非常接近	完全一致
羞怯					
胆小					
腼腆					
羞涩					
退缩					
安静					
内向					
拘束					
怕生					
矜持					
低调					
含蓄					
胆怯					
拘谨					

3. 你认为**害羞 (shyness)**的反义词是什么_____?

4. 对于下面的每一个词语, 请选择一个你认为最符合**害羞**的反义词程度。

词汇	完全无关	有一些接近	中等接近	非常接近	完全一致
大方					
外向					
爽朗					
健谈					
豪放					
开放					
大气					
张扬					
炫耀					
骄傲					
自豪					
自大					
勇敢					
开朗					
活泼					
自信					
洒脱					

5. 对于下面的每一个词语，请选择一个你认为最符合表示**积极 (positive)**的程度。

词汇	完全不积极	有一些不积极	中等积极	有一些积极	特别积极
美好					
成功					
完美					
快乐					
愉悦					
美好					
舒心					
有趣					
开心					
富有					
幸福					
有爱					

6. 对于下面的每一个词语，请选择一个你认为最符合表示**消极** (negative) 的程度。

词汇	完全不消极	有一些不消极	中等消极	有一些消极	特别消极
无能					
失败					
悲伤					
贫穷					
失望					
脆弱					
颓废					
懒惰					
哭泣					
痛苦					
绝望					
沮丧					

Appendix K

The Beliefs Shyness Scale in Mandarin

如果一个人具有以下个性特点，请选择您认为这些特点是“不可接受”还是“可以接受”。

选项：1= “这很不可以接受”， 2= “这有点不可以接受”， 3= “有点可以接受”， 4= “完全可以接受”

	这很不可以接受	这有点不可以接受	有点可以接受	完全可以
接受				
害羞	1	2	3	4
腼腆	1	2	3	4
大方	1	2	3	4
羞怯	1	2	3	4
爽朗	1	2	3	4
羞涩	1	2	3	4
开朗	1	2	3	4
胆小	1	2	3	4
活泼	1	2	3	4
怕生	1	2	3	4
自信	1	2	3	4

Appendix L

Chinese Version of Implicit Association Test-shyness

Implicit association test procedure involves a series of seven tasks. In each task, participants will be asked to categorize stimuli into two categories. For example, participant will be presented with a computer screen on which the word "害羞" appears in the top left-hand corner and the word "非害羞" appears in the top right-hand corner. In the middle of the screen a word, such as hesitant, that is typically associated with either the categories of "害羞" or "非害羞". For each word that appears in the middle of the screen, participant is asked to sort the word into the appropriate category by pressing "E" or "I" key. The reaction time will be recorded. These are the four groups and the items that belong to each:

Category	Items
Shy	腼腆, 羞怯, 羞涩, 胆小, 怕生
Non-Shy	大方, 爽朗, 开朗, 活泼, 自信
Positive	快乐, 愉悦, 幸福, 有爱, 美好
Negative	颓废, 无能, 绝望, 痛苦, 沮丧