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Sad, Scared, or Rejected? A Short-Term Longitudinal Study of the Predictors of Social Avoidance in Chinese Children

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Abstract

The goal of the present study was to empirically examine different conceptual mechanisms previously postulated to underlie the development of social avoidance in childhood. Participants were $N = 601$ children (321 boys, 280 girls) attending elementary schools ($M_{age} = 10.21$ years) and middle schools ($M_{age} = 12.77$ years) in Shanghai, P.R. China. Measures of motivations for social withdrawal (shyness, unsociability, social avoidance) and socio-emotional adjustment were collected using self-reports and peer nominations at two time-points separated by 9 months. Results from cross-lagged panel analyses indicated that: (1) social avoidance and symptoms of social anxiety were not reciprocally related over time; (2) Time 1 social avoidance predicted incremental change in Time 2 peer problems (whereas Time 1 peer problems did not predict incremental change in Time 2 social avoidance); and (3) Time 1 symptoms of depression significantly predicted incremental change in Time 2 social avoidance (whereas Time 1 social avoidance did not predict incremental change in Time 2 symptoms of depression). These results provide evidence in support of depressive symptoms (but not symptoms of social anxiety or peer problems) as a salient predictor of social avoidance. Results are discussed in terms of the development and implications of social avoidance in Chinese culture.

Keywords Social withdrawal · Social avoidance · Social anxiety · Depression · Peer problems

Socially withdrawn children habitually remove themselves from opportunities for peer interaction, and as a result, tend to spend more time alone than their more sociable counterparts (Rubin et al. 2009). Since peer interaction provides an important and unique context for children's social, emotional, cognitive, and moral development, social withdrawal is considered a risk factor for contemporaneous and later socio-emotional difficulties (Rubin et al. 2015). However, it also appears to be important to further consider the *reasons* why children might choose to remain alone in the face of opportunities for peer interaction (Asendorpf 1990; Coplan et al. 2015). For example, some children may be motivated to interact with peers but engage in social withdrawal because of social fears and social-evaluative concerns (i.e., *shyness,* Coplan et al. 2004; Crozier 1995). In contrast, other children may simply enjoy solitary activities (i.e., *unsociability*, Coplan and Weeks 2010). In the present study, our focus was on *social avoidance,* which is thought to reflect active evasion of social interaction with peers (Asendorpf 1990; Coplan and Armer 2007).

Although we know very little about social avoidance in childhood (Coplan et al. 2015), several conceptual models of the processes that may underlie its development have been proposed (Asendorpf 1990; Bowker and Raja 2011; Chen 2010; Coplan and Armer 2007; Coplan et al. 2015; Rubin et al. 2009; Schmidt and Fox 1999). Drawing upon influential theoretical models of the development of social withdrawal (Rubin et al. 1991), these conceptual pathways encompass the interplay among various *individual* effects (e.g., child temperament, motivational and emotional process) and *interpersonal* environments (e.g., peers, culture). Empirical studies of social avoidance remain scarce, and to date, there have been no attempts to directly test (and compare) these different theoretical postulations. Accordingly, the primary goal of the present study was to seek empirical support for

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different conceptual models of the development of childhood social avoidance in Chinese children. To accomplish this goal, we conducted a short term longitudinal study and employed cross-lagged panel analyses to examine conceptually-derived predictors of change in social avoidance over a 9-month period.

Overview of Social Withdrawal in Childhood

Contemporary research in childhood social withdrawal has been heavily influenced by Asendorpf's (1990) theoretical model of social approach and social avoidance motivations. From this perspective, shyness is characterized by an approach-avoidance conflict, whereby the desire for peer interaction (i.e., high social approach motivation) is simultaneously inhibited by social fear and anxiety (i.e., high social avoidance motivation, Coplan et al. 2004). In Western cultures, there is considerable research linking childhood shyness (and related constructs) to socio-emotional difficulties, particularly in the form of internalizing problems (e.g., social anxiety) and negative peer experiences (e.g., exclusion, Coplan et al. 2013; Crozier 1995; Karevold et al. 2012; Gazelle and Rudolph 2004).

The earliest studies of childhood shyness in China suggested that this characteristic was once culturally valued and associated with positive social and school outcomes (Chen et al. 1992, 1995). However, results from more recent studies have consistently indicated that shyness in urban China is now similarly associated with indices of internalizing problems and peer difficulties (Coplan et al. 2017; Ding et al. 2014; Liu et al. 2018a; Zhang and Eggum-Wilkens 2018). This *shift* is thought to be attributed to large-scale economic and social reforms that have occurred in urban China over the last 25 years (Chen et al. 2005), which appear to have altered views regarding traits such as competitiveness and social assertiveness (Chen 2010).

Asendorpf (1990) characterized *unsociability* as reflecting a combination of both low social approach and low social avoidance motivations. Unlike shyness, unsociability in Western cultures has been viewed as relatively benign in terms of its potential implications for children's socio-emotional functioning (Coplan and Weeks 2010). In support of this notion, unsociability in childhood is largely reported to be not significantly associated with indices of internalizing problems and peer difficulties, particularly after controlling for the effects of shyness (Coplan and Weeks 2010; Coplan et al. 2013; Ladd et al. 2011; Sette et al. 2017).

Chen (2010) suggested that positive views of unsociability in Western societies may stem from cultural values that encourage personal choice and autonomy. In contrast, *voluntarily* removing oneself from the peer context (as opposed to refraining from social interactions due to social fear and anxiety) might violate Chinese cultural norms regarding collectivism, interdependence, and social affiliation, which have persisted despite ongoing societal changes. Chen (2010) suggested that this prioritizing of individualistic preferences over group needs may evoke a negative response to unsociability in China. There is strong recent support for this assertion, as unsociability among urban Chinese children has been consistently associated with internalizing problems and peer difficulties (Chen et al. 2011; Coplan et al. 2016; Ding et al. 2015b; Liu et al. 2014b, 2015a).

Conceptual Models of Social Avoidance Asendorpf (1990) described a third form of social withdrawal, *social avoidance*, as characterized by the combination of low social approach but also high social avoidance motivations. He further speculated that socially avoidant children might be at the greatest risk for the most pervasive socio-emotional difficulties, but otherwise did not discuss this form of social withdrawal in particular detail. Subsequently, there has been conceptual speculation about the meaning of social avoidance in childhood, and the processes that might underlie its development (Coplan et al. 2015).

One postulation is that social avoidance represents social anxiety (e.g., akin to extreme shyness, Schmidt and Fox 1999). From this perspective, the desire to interact with peers (social approach motivations) that may characterize shy children (Coplan et al. 2004) becomes *extinguished* over time because of ongoing extensive social fears and social-evaluative concerns typical of more serious social anxiety (La Greca and Stone 1993). Related to this idea is the suggestion that repeated and consistent exposure to negative peer experiences might similarly diminish social approach motivations and thus promote the development of social avoidance over time (Bowker and Raja 2011; see also Gazelle and Rudolph 2004). Finally, it has also been hypothesized that social avoidance may be most closely tied to depression (Coplan and Armer 2007), perhaps presenting as a maker of social anhedonia (i.e., reduced capacity to derive pleasure from social engagement; Blanchard et al. 2000).

However, to date there has been very limited empirical study of social avoidance both in the West and in China, and results have been somewhat mixed in terms of providing evidence of a clear etiological pathway. For example, in samples of adolescents and emerging adults, social avoidance has been associated with a wide range of negative outcomes, including indices of internalizing problems (low self-esteem, loneliness, emotion dysregulation, anxiety sensitivity, depression, social anhedonia) and peer difficulties (exclusion, poor relationship quality) (Bowker and Raja 2011; Bowker et al. 2017; Nelson 2013).

Coplan et al. (2013) created extreme groups of socially withdrawn Canadian children (aged 9–12 years) using self-

reports of shyness and preference for solitude. One group characterized by high scores of both shyness and preference for solitude was conceptualized as representing socially avoidant children. As compared to the shy, unsociable, and non-withdrawn comparison groups, socially avoidant children reported the highest scores for both symptoms of social anxiety and depression. Most recently, Coplan et al. (2018) examined the concomitants of parent-rated shyness, unsociability, and social avoidance in a sample of young Canadian children. In a structural equation model, social avoidance and shyness (but not unsociability) uniquely predicted peer problems. However, after controlling for peer problems, shyness (but not social avoidance) retained a direct path to social anxiety symptoms, whereas social avoidance (but not shyness) retained a direct path to depressive symptoms.

We would similarly expect social avoidance to be associated with negative outcomes in China because, as aforementioned, the desire to withdraw from social interactions runs counter to cultural norms regarding group affiliation (Chen 2010). In support of this notion, Ding and colleagues (Ding et al. 2015a) found that young Chinese children had the most negative views and expected the most negative outcomes for hypothetical avoidant peers (compared to both shy and unsociable peers). Coplan et al. (2016) compared extreme groups of socially withdrawn Chinese children (aged 10–12 years) and reported that socially avoidant children (i.e., high on both shyness and preference for solitude) reported higher symptoms of depression, social anxiety, and loneliness as compared to their shy and unsociable counterparts.

To date, there has only been one study that directly assessed the construct of social avoidance in Chinese children. Sang et al. (2018) recently created and validated a new self-report measure of social avoidance in a large sample of Chinese children (aged 9–14 years). In regression analyses, self-reported social avoidance was uniquely (i.e., controlling for shyness and unsociability) associated with indices of internalizing problems (self-reports and teacher ratings) and peer problems (peer nominations and teacher ratings). Taken together, the results from these few relevant previous studies have not provided conclusive evidence of specific processes that may underlie the development of social avoidance in childhood.

The Present Study

Empirical studies of social avoidance remain limited, particularly in childhood. To our knowledge, there have been no previous *longitudinal* studies examining the development or implications of social avoidance. It has been suggested that social avoidance may: (1) primarily reflect social anxiety (Schmidt and Fox 1999); (2) develop in response to repeated negative peer experiences (e.g., rejection, victimization) (Bowker and Raja 2011); and (3) represent an early manifestation of depression (Coplan and Armer 2007). But, despite theoretical speculations, the processes that may underlie changes in social avoidance over time remain empirically untested. Accordingly, the primary goal of this study was to directly examine three previously hypothesized predictors of social avoidance using a longitudinal cross-lagged panel design.

There has been at least some empirical support for each of the proposed theoretical mechanisms (Coplan et al. 2015). These models include *individual* effects (e.g., motivational and emotional processes) and *interpersonal* environments (e.g., peers) embedded within a unique cultural context. As a starting point, we aimed to assess each process individually by testing three separate predictive models in a cross-lagged design. However, these three proposed conceptual mechanisms (i.e., social anxiety, peer problems, depression) are *not* mutually exclusive. Accordingly, it was at least plausible that all three variables would predict changes in social avoidance over time.

Previous studies of social withdrawal in China have relied primarily upon peer nomination procedures to assess different forms of social withdrawal (e.g., Chen et al. 2011; Liu et al. 2014b, 2015b). Although peer nominations have clear methodological advantages in the assessment of children's social behaviors, the internal motivational and emotional processes that underlie and distinguish shyness, unsociability, and social avoidance may be best assessed via self-reports (Coplan et al. 2013). As well, in order to assess the *unique* effects of social avoidance, we followed previous protocols and controlled for the effects of shyness and unsociability (e.g., Bowker and Raja 2011; Coplan et al. 2018; Sang et al. 2018). Although not the primary focus of this study, we expected both shyness and unsociability to be associated with socio-emotional difficulties, as has been previously demonstrated in samples of urban Chinese children (Chen et al. 2011; Ding et al. 2015b; Liu et al. 2015a).

Finally, there is evidence to suggest that social withdrawal (regardless of underlying motivations) may hold more negative implications for boys than for girls (particularly in the peer group) because such behaviors violate gender norms pertaining to male social assertion and dominance (Doey et al. 2014). However, no gender differences have been reported in the implications of social avoidance in Western or Chinese children (e.g., Coplan et al. 2018; Sang et al. 2018). Accordingly, gender differences in the predictive relations of social avoidance in the current study were examined on an exploratory basis.

Method

Participants

Participants were $N = 601$ children (321 boys, 280 girls) in grades four and five from one public elementary school

(n = 357, M_{age} = 10.21 years, SD = 0.50 years), and in grades six and seven from another public middle school (n = 244, M_{age} = 12.77 years, SD = 0.36 years) in Shanghai, P.R. China. Children were randomly selected from 8 classes in elementary school and 6 classes in middle school (with about 40 children in each class). All children were of Han descent, which is the predominant ethnic group (92% of the population) in China. The demographic data for the present sample were typical of elementary and middle school children living in urban centers in China (National Bureau of Statistics of China 2011). For example, the families in the region were mostly from middle social class, about 90% of the participants were from intact families, and about 90% were only children (due to the *one child policy*, a population control policy instituted in China since the 1980s[1]).

Procedure

Data were collected over the course of a single school year (i.e., children remained in the same class), with Time 1 data collection in September (i.e., the start of the school year) and Time 2 data collected 9 months later in June (i.e., the end of the school year). Attrition was very low (only three children did not participate at Time 2). Consent forms were first sent home to parents, and about 98% of parents provided positive consent. Assessments included child self-reports and peer nominations collected during group testing (supervised by trained researchers) at school.

Measures

Social Withdrawal Children provided self-reports of their motivations for social withdrawal. Social avoidance was measured via the Chinese version of the *Social Avoidance Scale* (Sang et al. 2018), which includes 4 items (rated from 1 = "Not at all" to 5 = "Always") describing behaviors of actively avoiding social interaction: (1) "I don't want to play with other children"; (2) "I actively avoid playing with other children"; (3) "I often turn down social invitations from other children because I want to be alone"; and (4) "I often go out of my way not to play with other children". This measure has previously demonstrated good psychometric properties and evidence of validity in Chinese children (Sang et al. 2018). In the present sample, it also demonstrated high internal consistency (α = 0.87 at Time 1, α = 0.88 at Time 2).

Shyness was assessed with the Chinese version of the *Children's Shyness Questionnaire* (Crozier 1995; Ding et al. 2014), which includes 25 items (on a 3-point scale from 1 = "No" to 3 = "Yes") describing emotional and behavioral components of shyness (e.g., "I feel shy when I have to read aloud in front of the class"; "I usually talk to only one or two close friends") as experienced in both familiar and unfamiliar situations, with both peers and adults. The measure has proved to be reliable and valid in Chinese children (Ding et al. 2014) and demonstrated high internal consistency in the present sample (α = 0.87 at Time 1, α = 0.89 at Time 2).

Unsociability was measured with the Chinese version of the *Child Social Preference Questionnaire* (Coplan et al. 2013, 2016), which includes 7 items (rated from 1 = "Not at all" to 5 = "Always") assessing a generalized preference for spending time alone (e.g., "If given the choice, I prefer to play alone rather than with other kids"; "I usually prefer doing things alone", see Coplan et al. 2013 for a complete list of items). This measure has demonstrated good psychometric properties and evidence of validity in Chinese samples (Coplan et al. 2016) and also demonstrated good internal consistency in the present sample (α = 0.83 at Time 1, α = 0.86 at Time 2).

Results from confirmatory factor analyses indicated that the expected three-factor structure (i.e., shyness, unsociability, social avoidance) fit the data well at both time points: Time 1, χ^2 = 1951.51, df = 591, χ^2/df = 3.30, p < 0.001, RMSEA = 0.06, NFI = 0.92, NNFI = 0.92, CFI = 0.93, GFI = 0.85, IFI = 0.93; Time 2, χ^2 = 1606.85, df = 591, χ^2/df = 2.72, p < 0.001, RMSEA = 0.06, NFI = 0.93, NNFI = 0.95, CFI = 0.95, GFI = 0.85, IFI = 0.95.

Social Anxiety Symptoms Social anxiety symptoms were measured by the *Social Anxiety Scale for Children-Revised* (SASC-R, La Greca and Stone 1993), an 18-item measure (including 4 filler items, rated from 1 = "Not at all" to 5 = "Always") of social anxiety symptoms in children. This measure includes three subscales: *fear of negative evaluation* (SAD-FNE, 8 items, e.g., "I worry about being teased"), *social avoidance and distress to novelty* (SAD-NEW, 6 items, e.g., "I feel shy around kids I don't know"), and *general social avoidance and distress* (SAD-GEN, 4, items, e.g. "I am quiet when I'm with a group of kids"). Scores were averaged to form indices of each subscale, with higher scores indicating greater feelings of social anxiety. This measure has demonstrated evidence of reliability and validity in Chinese children (e.g., Liu et al. 2015b) and demonstrated good internal consistency in the present sample (α = 0.93, 0.89, 0.70 for each subscale at Time 1, α = 0.94, 0.85, 0.71 for each subscale at Time 2).

Peer Problems Following standard protocols (e.g., Gommans and Cillessen 2015), children were asked to nominate up to three classmates with whom they least liked to be with. Nominations received from all classmates were totaled and standardized within each class and cross-gender nominations were allowed. The negative nominations received from peers provided an index of peer rejection. These

[1] This policy was changed in 2010 and Chinese parents have since been allowed to have more than one child.

procedures have been previously proved valid with Chinese children (Sang et al. 2018).

Peer victimization was assessed by peers using a measure adapted from the *Revised Class Play* (Chen et al. 1992; Masten et al. 1985). Administrators read four behavioral descriptors of peer victimization (e.g., "Is pushed or hit by other kids"; "Is bullied and picked on by other kids") and children nominated up to three classmates who could best fit the descriptions. Subsequently, nominations received from all classmates were tabulated for each child (the scores were standardized within class). This measure has proved to be reliable and valid in Chinese children (e.g., Liu et al. 2015a) and demonstrated high internal consistency ($\alpha = 0.88$ at Time 1, $\alpha = 0.90$ at Time 2).

Depressive Symptoms Depressive symptoms were measured by the 14 item Chinese version of the *Children's Depression Inventory* (CDI, Kovacs 1992). There are three alternative responses for each item from which the participant chooses the one that best describes her/him in the past 2 weeks. The items measure cognitive, behavioral, and emotional symptoms of depression (e.g., self-blame, fatigue, reduced appetite). A total score of depressive symptoms was computed by averaging all item scores, with higher scores indicative of greater depressive symptoms. Evidence of the factor structure, reliability, and validity of the 14-item Chinese version of the CDI has been demonstrated in several previous studies of Chinese children (e.g., Coplan et al. 2016; Liu et al. 2014b; Sang et al. 2018). This measure also demonstrated good internal consistency in the present sample ($\alpha = 0.86$ at Time 1, $\alpha = 0.85$ at Time 2).[2]

Results

Preliminary Analyses

Descriptive statistics and correlations for all study variables at both time points are displayed in Table 1. Some of the peer-nominated variables demonstrated high skewness (e.g., peer rejection = 2.92 and 2.83 at Time 1 and Time 2, peer victimization = 2.90 and 3.10 at Time 1 and Time 2). Log transformation of the data did not alter the findings, so results are presented with the untransformed variables.

[2] Of note, there is one item in this version of the CDI that can be viewed as a general assessment of *social motivations* (i.e., "I like being with people"). The content of this item may potentially overlap with the content of measures of social withdrawal. Accordingly, we recomputed a 13-item version of the CDI (removing this item) and re-ran all analyses. The pattern of results was unchanged. Accordingly, we report all analyses with the complete measure of depression herein, in order to allow for a more direct comparison with previous research.

A repeated measures multivariate analysis of variance was conducted to assess grade and gender differences in shyness, unsociability, and social avoidance. Results indicated a significant main effect of Grade, $F(3, 536) = 19.47$, $p < 0.001$, $\eta^2 = 0.10$. Children in middle school reported higher levels of social avoidance ($M_{Time1} = 1.42$, $SD = 0.63$; $M_{Time2} = 1.46$, $SD = 0.64$), shyness ($M_{Time1} = 1.64$, $SD = 0.32$; $M_{Time2} = 1.70$, $SD = 0.35$), and unsociability ($M_{Time1} = 2.31$, $SD = 0.84$; $M_{Time2} = 2.32$, $SD = 0.88$) than children in elementary school (social avoidance, $M_{Time1} = 1.28$, $SD = 0.62$; $M_{Time2} = 1.25$, $SD = 0.58$; shyness, $M_{Time1} = 1.55$, $SD = 0.34$; $M_{Time2} = 1.51$, $SD = 0.34$; unsociability, $M_{Time1} = 1.93$, $SD = 0.86$; $M_{Time2} = 1.85$, $SD = 0.82$).

Significant Time × Grade interactions were also found, $F(3, 536) = 5.74$, $p = 0.00$, $\eta^2 = 0.03$. Shyness decreased in elementary school children ($M_{Time1} = 1.55$, $SD = 0.34$; $M_{Time2} = 1.51$, $SD = 0.34$, $t = 2.19$, $p = 0.03$) but increased in middle school children ($M_{Time1} = 1.64$, $SD = 0.32$; $M_{Time2} = 1.70$, $SD = 0.35$, $t = -3.38$, $p < 0.001$) from Time 1 to Time 2. There were no significant main effects of Gender, $F(3, 536) = 1.61$, $p = 0.19$, $\eta^2 = 0.01$, Time, $F(3, 536) = 0.97$, $p = .41$, $\eta^2 = 0.01$, Gender × Grade interaction, $F(3, 536) = 2.20$, $p = 0.09$, $\eta^2 = 0.01$, or Time × Gender × Grade interaction, $F(3, 536) = 0.21$, $p = 0.89$, $\eta^2 = 0.00$.

Results from correlation analyses were consistent with conceptual expectations. Of note, all variables maintained moderate to high stability across 9 months. Shyness, unsociability, and social avoidance were significantly and moderately inter-associated at both Time 1 and Time 2. Social avoidance was significantly and positively associated with all indices of socio-emotional difficulties at both Time 1 and Time 2.

Predictors of Incremental Change in Social Avoidance

The goal of this set of analyses was to explore the predictive relations between social avoidance and indices of socio-emotional adjustment from Time 1 to Time 2, while controlling for other forms of social withdrawal (shyness, unsociability) and stability effects. Separate cross-lagged panel analyses were conducted for social anxiety symptoms, peer problems (rejection, victimization) and depressive symptoms.

Social Anxiety Symptoms To examine cross-lagged effects for social avoidance and social anxiety symptoms, a structural equation model framework (using LISREL 8.70) was conducted. As with previous studies (Liu et al. 2014b), we controlled for the effects of Time 1 shyness and Time 1 unsociability. Given these data were longitudinal, error covariance of the same variables between Time 1 and Time 2 were freed to vary. The three subscales of the SASC-R were entered as indicators of social anxiety symptoms in the analyses.

We were primarily interested in the reciprocal effects between social avoidance and social anxiety symptoms from

Table 1 Means, standard deviations, and intercorrelations for all study variables

	1	2	3	4	5	6	7	8	9
1. Social Avoidance	0.52**	0.34**	0.52**	0.50**	0.35**	0.34**	0.45**	0.12**	0.13**
2. Shyness	0.30**	0.70**	0.30**	0.52**	0.54**	0.64**	0.55**	0.02	0.09*
3. Unsociability	0.50**	0.33**	0.53**	0.48**	0.35**	0.26**	0.32**	0.09*	0.10*
4. Depression	0.53**	0.49**	0.51**	0.66**	0.53**	0.41**	0.49**	0.12**	0.15**
5. SAD-FNE	0.35**	0.53**	0.35**	0.52**	0.54**	0.63**	0.63**	0.05	0.09*
6. SAD-NEW	0.26**	0.66**	0.22**	0.35**	0.50**	0.57**	0.69**	−0.02	0.03
7. SAD-GEN	0.43**	0.63**	0.31**	0.45**	0.57**	0.64**	0.51**	0.09*	0.10*
8. Peer Rejection	0.20**	0.03	0.04	0.17**	0.15**	0.02	0.09*	0.79**	0.75**
9. Peer Victimization	0.21**	0.10*	0.10*	0.22**	0.16**	0.10*	0.14**	0.74**	0.80**
Time 1 *M(SD)*	1.35(0.65)	1.59(0.33)	2.10 (0.88)	1.37(0.32)	2.21(1.11)	1.96(1.07)	1.63(0.83)		
Time 2 *M(SD)*	1.33(0.61)	1.59(0.36)	2.03(0.88)	1.34(0.32)	2.04(1.09)	1.92(1.00)	1.63(0.81)		

Time 1 results are displayed in lower left quadrant, Time 2 results are displayed in upper right quadrant. Values displayed along the diagonal represent correlations between Time 1 variables and their correspondents at Time 2. Descriptive statistics for peer rejection and peer victimization are not included because the scores were standardized within classrooms

*$p < 0.05$; **$p < 0.01$

Time 1 to Time 2. We also tested gender differences in these reciprocal effects (multi-group models) by comparing a series of nested models. These nested models constrained the "Time 1 social avoidance to Time 2 social anxiety symptoms" and the "Time 1 social anxiety symptoms to Time 2 social avoidance" paths to be equal between boys and girls, separately. A significant $\triangle\chi^2$ between these more parsimonious models and the baseline model would indicate that the predictive relations were different between boys and girls.

Results indicated that the model fit the data well, $\chi^2 = 258.65$, $df = 65$, $\chi^2/df = 3.98$, $p < 0.001$, RMSEA = 0.06, NFI = 0.97, NNFI = 0.97, CFI = 0.98, GFI = 0.94, IFI = 0.98 (Hu and Bentler 1999). As displayed in Fig. 1, after controlling for the effects of Time 1 shyness (on Time 2 social avoidance: $\beta = 0.08$, $p = 0.04$; on Time 2 social anxiety: $\beta = 0.20$, $p < 0.001$) and Time 1 unsociability (on Time 2 social avoidance: $\beta = 0.24$, $p < 0.001$; on Time 2 social anxiety; $\beta = 0.15$, $p < 0.001$), neither social avoidance ($\beta = 0.07$, $p = 0.37$) nor social anxiety symptoms ($\beta = -0.03$, $p = 0.74$) at Time 1 predicted incremental change in the other at Time 2. Results from multi-group structural model comparisons indicated no significant gender differences in the effect of social avoidance on social anxiety symptoms over time, $\triangle\chi^2(1) = 0.04$, $p = 0.85$. The path from Time 1 social anxiety symptoms to Time 2 social avoidance also did not differ significantly by child gender, $\triangle\chi^2(1) = 0.01$, $p = 0.92$.

Peer Problems A similar protocol was employed for examining cross-lagged associations between social avoidance and peer problems. Peer rejection and peer victimization were used as indicators of peer problems in the cross-lagged panel analyses. Results indicated that the model fit the data well, $\chi^2 = 127.30$, $df = 43$, $\chi^2/df = 2.96$, $p < 0.001$, RMSEA = 0.06, NFI = 0.98, NNFI = 0.98, CFI = 0.98, GFI = 0.97, IFI = 0.99. As displayed in Fig. 2, after controlling for the effects of Time 1 shyness ($\beta = -0.03$, $p = 0.18$) and Time 1 unsociability ($\beta = 0.08$, $p = 0.02$), Time 1 social avoidance significantly predicted higher levels of Time 2 peer problems ($\beta = 0.11$, $p = 0.02$). In contrast, Time 1 peer problems did not significantly predict Time 2 social avoidance ($\beta = 0.05$, $p = 0.17$), after controlling for the effects of Time 1 shyness ($\beta = 0.04$, $p = 0.33$) and unsociability ($\beta = 0.24$, $p < 0.001$). Results from multi-group structural model comparisons indicated no significant gender differences in the effect of social avoidance on peer problems over time, $\triangle\chi^2(1) = 0.69$, $p = 0.41$. As well, the path from Time 1 peer problems to Time 2 social avoidance did not differ significantly by child gender, $\triangle\chi^2(1) = 0.06$, $p = 0.80$.

Depressive Symptoms A similar protocol was employed for examining cross-lagged associations between social avoidance and depressive symptoms. Given that the measure of depressive symptoms was unidimensional, we conducted item parceling to create three parcels by factorial algorithm protocols (Rogers and Schmitt 2004). Results indicated that the model fit the data well, $\chi^2 = 213.88$, $df = 65$, $\chi^2/df = 3.29$, $p < 0.001$, RMSEA = 0.06, NFI = 0.98, NNFI = 0.99, CFI = 0.99, GFI = 0.95, IFI = 0.99. As displayed in Fig. 3, after controlling for the effects of Time 1 shyness ($\beta = 0.02$, $p = 0.54$) and Time 1 unsociability ($\beta = 0.20$, $p < 0.001$). Time 1 depressive symptoms significantly predicted higher levels of Time 2 social avoidance ($\beta = 0.22$, $p < 0.001$). In contrast, Time 1 social avoidance did not significantly predict Time 2 depressive symptoms ($\beta = -0.03$, $p = 0.27$), after controlling for

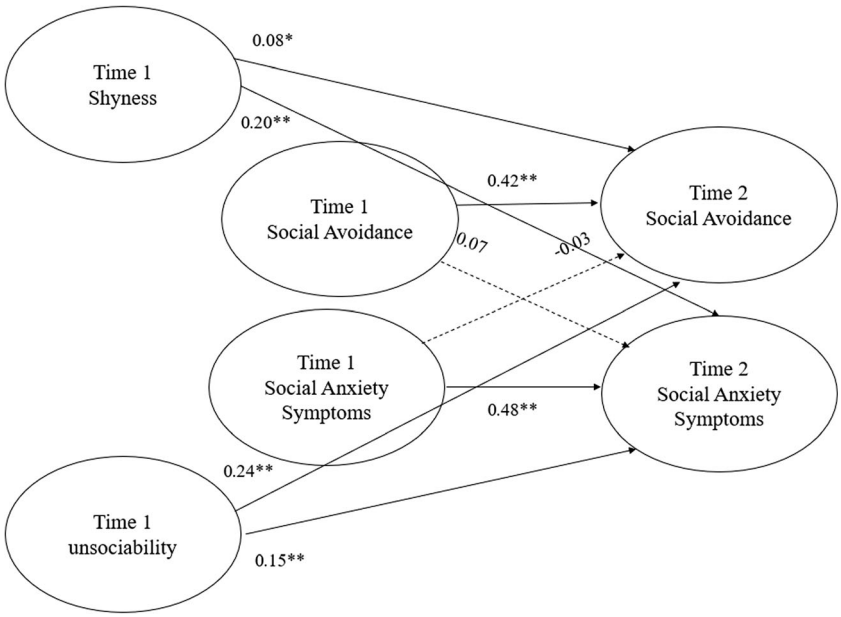

Fig. 1 SEM model of predictive relations between social avoidance and social anxiety symptoms. Notes: *$p < 0.05$; **$p < 0.01$; Indicators have been removed to ease presentation

Time 1 shyness ($\beta = -0.03$, $p = 0.35$) and unsociability ($\beta = 0.04$, $p = 0.31$). Results from multi-group structural model comparisons indicated no significant gender differences in the effect of social avoidance on depressive symptoms over time, $^{\Delta}\chi^2(1) = 1.31$, $p = 0.25$. As well, the path from Time 1 depressive symptoms to Time 2 social avoidance did not differ significantly by child gender, $^{\Delta}\chi^2(1) = 0.65$, $p = 0.42$.

Discussion

Three processes have been theorized to underlie the development of social avoidance in childhood: (1) an early manifestation of depression (Coplan and Armer 2007); (2) social anxiety (Schmidt and Fox 1999); and (3) negative peer experiences (Bowker and Raja 2011). However, to our knowledge, there have been no previous studies empirically examining how such individual and interpersonal factors may predict incremental changes in social avoidance over time. Accordingly, the primary goal of the present study was to test these previously postulated predictors of social avoidance using a longitudinal cross-lagged panel design in a sample of Chinese children. Key among our results, Time 1 symptoms of depression (but not social anxiety or peer problems) emerged as the only significant predictor of incremental change in social avoidance at Time 2 (9 months later).

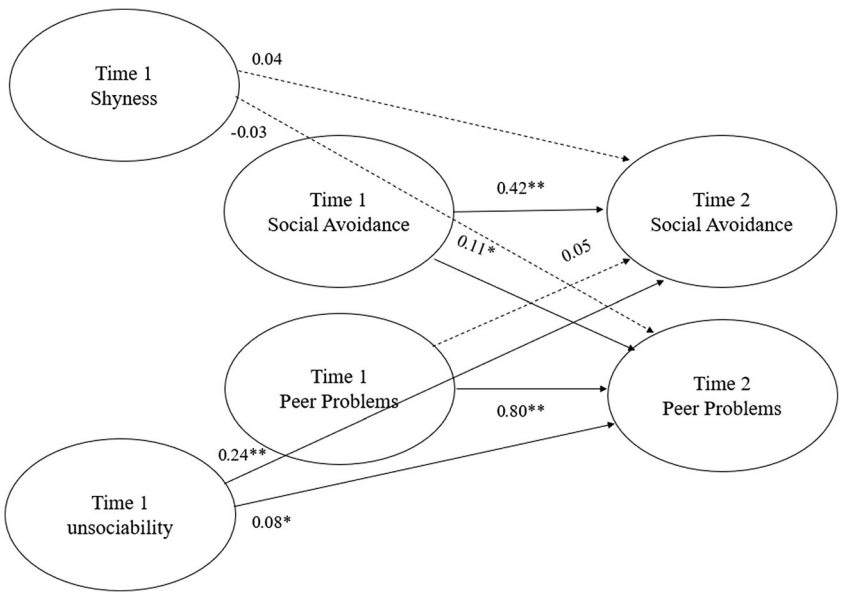

Fig. 2 SEM model of predictive relations between social avoidance and peer problems. Notes: *$p < 0.05$; **$p < 0.01$; Indicators have been removed to ease presentation

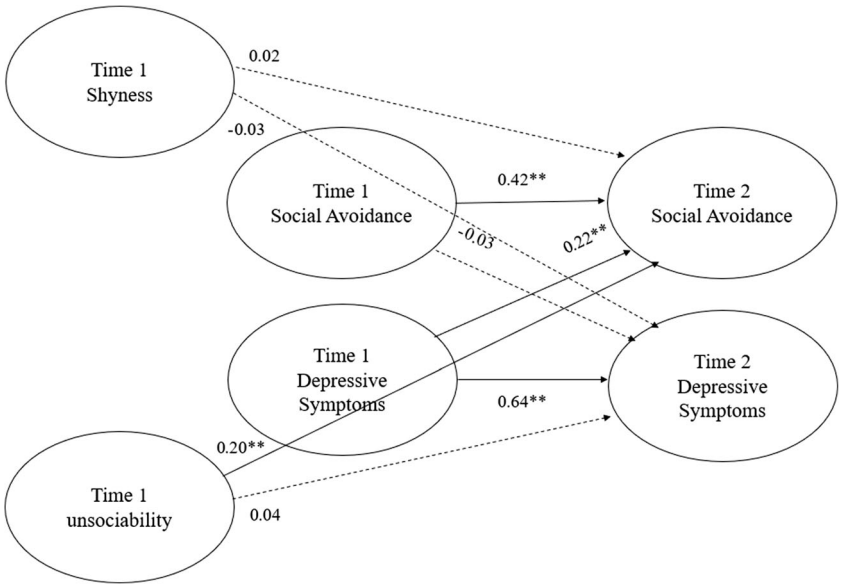

Fig. 3 SEM model of predictive relations between social avoidance and depressive symptoms. Notes: $^{**}p < 0.01$; Indicators have been removed to ease presentation

Implications of Social Withdrawal in Chinese Children

Interdependence, collectivism, and group orientation are highly valued in Chinese culture (Chen 2010). As such, it was hypothesized that removing oneself from the peer group (irrespective of underlying social motivations) would be associated with adjustment difficulties among Chinese children. Overall, our findings were consistent with this assertion, as shyness, unsociability, and social avoidance were all concurrently associated with symptoms of internalizing problems (depression, social anxiety) and peer difficulties (rejection, victimization) at both time points. These findings are consistent with recent studies indicating that shyness (e.g., Coplan et al. 2017; Ding et al. 2014), unsociability (Chen et al. 2011; Ding et al. 2015b; Liu et al. 2014a, b) and social avoidance (Sang et al. 2018) are all contemporaneously associated with socio-emotional difficulties in Chinese children. Together, the current findings do not bode well for socially withdrawn children in China. Of particular note, results from a growing number of recent studies demonstrate that both internalizing problems (i.e., individual factors) and peer difficulties (i.e., interpersonal factors), in and of themselves, carry additional negative consequences for Chinese youth (Liu et al. 2014a, 2015b, 2017, 2018b).

Predictors of Change Social Avoidance over an Academic Year

The primary goal of this study was to examine predictors of change in social avoidance over time. Specifically, we sought evidence in support of three different theoretical models postulating both individual and interpersonal factors that might serve to underlie the development of social avoidance. We found limited support for the role of *social anxiety* in relation to the development of social avoidance (Schmidt and Fox 1999). Results from correlation analyses indicated that social avoidance was significantly and positively correlated with social anxiety symptoms at both time points. However, after controlling for shyness and unsociability (as well as the stability of social anxiety symptoms and social avoidance), results from cross-lagged panel analyses indicated that symptoms of social anxiety did not predict incremental change in social avoidance over time (nor vice versa). Thus, social anxiety and social avoidance appear to be relatively distinct constructs (at least in later childhood). Notwithstanding, actively avoiding social interactions remains a salient facet of social anxiety disorder (Rao et al. 2007). As such, it will likely remain a challenge to distinguish (at least in terms of measurement) between avoidant behavior arising from anxious versus other motivations.

In the case of *peer problems*, results from the cross-lagged panel analyses indicated that although peer problems did not predict incremental change in social avoidance over time, social avoidance did positively predict later peer problems. These findings provide only partial support for the hypothesis that consistent and elevated exposure to negative peer experiences may promote social avoidance over time (Bowker and Raja 2011). Our finding suggest that social avoidance may evoke heightened peer rejection and victimization over time. This is consistent with the notion that Chinese children who actively avoid the peer group in China may be at increased risk for negative peer experiences because they are violating cultural norms regarding interpersonal harmony and group affiliation (Chen 2010). This may prove to be particularly problematic in urban Chinese schools, where students remain with the same group of classmates for several years (Liu et al. 2017).

We did not find direct support for the notion that negative peer experiences exacerbate the development of social avoidance over time. However, consistent with the notion that social withdrawal might develop as a function of the interplay between individual and interpersonal factors, it has previously been reported that some children remove themselves from peers as a way to cope with negative peer relations (Eisenberg et al. 1998). As such, heightened negative peer experiences among socially avoidant youth may serve to encourage or strengthen avoidant motivations. Of note, given that the present sample was comprised of older children, we cannot discount the possibility that negative experiences in early childhood might have *already* contributed to the development of social avoidance (Coplan et al. 2014; Gazelle and Rudolph 2004).

We found the strongest support for the postulation that social avoidance may arise as a manifestation of symptoms of *depression* (Coplan and Armer 2007). Results from the few previous studies of social avoidance in childhood have reported concurrent associations with indices of depression in both the West (Coplan et al. 2013, 2018) and in China (Coplan et al. 2016; Sang et al. 2018). However, to our knowledge, this was the first study to test this association over time (using a cross-lagged panel design). Time 1 symptoms of depression were found to significantly predict incremental change in social avoidance at Time 2 (but social avoidance at Time 1 was not a significant predictor of Time 2 depressive symptoms).

Coplan and colleagues (Coplan et al. 2018) recently reported unique associations between social avoidance and feelings of sadness in early childhood. Thus, it is possible that depression and social withdrawal motivated by social avoidance may be linked from an early age, at least in the West. If children experience heightened feelings of depression, they may increasingly be motivated to avoid social situations as a means of self-protection from such negative feelings (Henderson et al. 2004). Depression may also be accompanied by social anhedonia (Blanchard et al. 2000), which has implications for reducing motivations to seek out social interactions (Brown et al. 2007). There is some preliminary evidence of an association between social avoidance and social anhedonia among young American adults (Bowker et al. 2017), however, this has yet to be explored in China.

Asendorpf (1990) speculated that as compared to shyness and unsociability, social avoidance may impart the most substantive risk for negative outcomes in childhood. This may be particularly true in China, perhaps additionally so because of its link with depression. Not only does depression appear to be more prominent in Chinese adolescents than in the West (Auerbach et al. 2010; Liu, Chen, et al., 2015), but China also has a comparatively very low rate for seeking treatment for depression and other mental health issues (Wang et al. 2007). As such, it will be important for future researchers to continue to examine novel (and culturally appropriate) approaches for identifying and treating depression in China (e.g., Yang et al. 2016). Nevertheless, unsociability and depressive symptoms both predicted increment increases (of similar strength) in social avoidance from Time 1 to Time 2, suggesting that the development of social avoidance in Chinese children over time may be more complex.

Taken together, the current findings highlight the importance of considering the effects of individual emotional (e.g., depressive symptoms) and social motivational processes underlying solitary behavior within the broader interpersonal (e.g., peer relations, socio-cultural influence) context in our understanding of the development and implications of socially withdrawn behaviors among Chinese children.

Caveats and Future Directions

The current study was the first to empirically and longitudinally explore the developmental processes of self-reported social avoidance, and provides strong initial support that early symptoms of depression may represent underlying developmental processes of social avoidance in Chinese children. Notwithstanding, some caveats should be considered in the interpretation of our findings. To begin, given the age of the participants in our sample and the internal/emotional nature of many of the constructs of interest, self-report assessments were deemed as most appropriate. However, this raises the possibility of heightened associations among variables stemming from the same sources of assessment (i.e., shared method variance). As such, replication of the current findings using multiple sources of assessment is warranted, particularly since there appears to be modest to moderate convergence across informants when assessing (at least some forms of) social withdrawal (Spangler and Gazelle 2009).

Shared method variance may also arise due to overlapping content across measures. For example, there is continued debate in the literature about the conceptual (and methodological) distinction between shyness and social anxiety in both children and adults (e.g., Heiser et al. 2009; Rapee and Coplan 2010). This may have accounted for the significant association between Time 1 shyness (but not Time 1 social avoidance) and Time 2 social anxiety. Accordingly, future research should undertake an item content overlap analysis (e.g., Lemery et al. 2002) in the Chinese versions of these measures.

Relatedly, shyness, unsociability, and social avoidance were conceptualized as sharing a common behavioral component (i.e., more time spent alone in the presence of peers), with different emotional and motivational substrates. In the current study, whereas the measure of social avoidance included both behavioral and motivational components, the measures of shyness (CSQ) and unsociability (CSPQ) did not directly assess solitary behaviors, per se (primarily capturing underlying emotional and motivational components of withdrawal).

However, both the CSQ and CSPQ have previously been found to uniquely predict time spent alone, as assessed via naturalistic observations at school and parental daily diaries of child activities outside of school (Coplan et al. 2013).

Notwithstanding, with these issues in mind, it is important to consider alternative explanations of the pattern of associations observed in our study. For example, as mentioned previously, social avoidance has also been conceptualized as an extreme manifestation of shyness (Schmidt and Fox 1999). Accordingly, in the current study, our measure of social avoidance may have been more likely to be associated with some negative outcomes than our measure of shyness because the measure of social avoidance specifically included items pertaining to avoiding social interaction (i.e., *acting shy*), whereas the measure of shyness focused more on emotional reactions (i.e., *feeling shy*).[3]

Next, the relatively short follow-up period (9 months) of our longitudinal design limits our ability to draw any conclusions that extend beyond this developmental period. For example, although social anxiety and peer problems did not predict subsequent changes in social avoidance, it is possible that the effects of these processes may have occurred earlier or might emerge later over a longer period of time. As such, future studies should explore these relations via a longer-term design (e.g., several years), and also include additional aspects of children's emotional (e.g., loneliness) and social adjustment (e.g., peer exclusion, friendship quality) as this would allow for a more thorough exploration on the development, stability, and implications of social avoidance across childhood.

It also remains to be seen how the implications of social avoidance may evolve later into adolescence. It has been argued that solitude (particularly when experienced outside of the school context) may become increasingly valued in adolescence, as a context for identity exploration and the development of the self-system (at least in the West, e.g., Goossens 2014; Larson 1997). It is unknown whether such a shift in attitudes and beliefs also emerges in China. Notwithstanding, this is also a developmental stage marked by the increased emergence of, and increased vulnerability to, depression (Davey et al. 2008). If socially avoidant motives for social withdrawal prove to be a marker for depressive symptoms that can be identified at earlier ages, there is an opportunity here for ameliorating the process of targeting children who might benefit from early intervention.

As noted, China also represents a unique cultural context in which to explore the implications of social withdrawal. However, social withdrawal may also serve different adaptive functions in different contexts *within* Chinese societies (Zhang and Eggum-Wilkens 2018). Our study was conducted in one of the most developed cities of China (i.e., Shanghai). However, rural areas of China have yet to be as affected by societal changes (e.g., Chen et al. 2009) and as such, the relations between adjustment and social avoidance may differ in this context. Moreover, we still know very little about how Western developmental models of social withdrawal (Rubin et al. 1991) might apply in this cultural context. It will be important for researchers to continue to specifically explore mediators and moderators of pathways to and from social withdrawal in China.

Finally, there has been recent interest in the development and implementation of intervention programs specifically targeting socially withdrawn children in China (Li et al. 2016). Our findings provide some enlightenments for the intervention of children at-risk for social avoidance (and subsequent adjustment problems). Future research should utilize the predicting effect of depression on social avoidance and develop intervention programs addressing the relief of children's depressed mood. Although our findings regarding social avoidance could be considered an initial first step, more work needs to be done in favor of potential intervention.

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Compliance with Ethical Standards

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Conflict of Interest The authors declare that they have no conflict of interest.

Ethical Approval All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

Informed Consent Informed consent was obtained from parents.

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