Behavioral Inhibition and Social Withdrawal across Cultures

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Abstract

Behavioral inhibition (BI) refers broadly to a temperament trait of avoiding interaction with novel stimuli because such stimuli provoke anxiety or distress. *Social withdrawal* (SW) is a related construct that refers more specifically to a tendency to avoid interaction with people. Research on these behaviors has flourished over the past thirty years. Such research has demonstrated that biological, cognitive, and social factors contribute in shaping children's BI and SW, and mutually influence the developmental outcomes of these behaviors. Recent research has also shed important light on cultural variability in the social and psychological implications of these behaviors.

Behavioral Inhibition and Social Withdrawal across Cultures

The study of children's behavioral inhibition and social withdrawal has flourished over the past thirty years, and research over the past decade has shed important light on the social and psychological implications of these behaviors across cultural contexts. *Behavioral inhibition* (BI) refers broadly to a temperament trait of avoiding interaction with novel stimuli—including objects, places, and people—because such stimuli provoke anxiety or distress (Fox et al., 2005; Kagan, 1997). Such behavior is found in roughly 10-20% of infants, although the prevalence of such behavior varies across cultures (Chen & French, 2008; Kagan, 1997). Through the 1980s and 1990s, Jerome Kagan and his colleagues pioneered work on the development and physiological correlates of BI during infancy and early childhood. Meanwhile, the labs of Kenneth Rubin, Mary Rothbart, and Jens Asendorpf explored behaviors theoretically linked to BI—*social withdrawal* (SW) and *shyness*—which, in contrast to BI, refer more specifically to a tendency to inhibit interactions with people. These research groups focused particularly on the development of SW and shyness during early childhood and identified factors that influence and are influenced by their development. The works of Kagan, Rothbart, Rubin, and Asendorpf, and of their colleagues and students have had a lasting and profound influence on the field.

Throughout the literature, the terms "social withdrawal" and "shyness" have often been used interchangeably, and different researchers have used these terms to refer to different constructs. Recently, theorists have conceptualized *social withdrawal* as a category of behaviors, encompassing several distinct sub-types of withdrawal, one of which is *shyness* (Asendorpf, 1990; Coplan & Rubin, 2010). The following section describes these sub-types. Next, common measures of BI and SW are described. Subsequent sections review biological, cognitive, and social correlates of BI and SW, and describe how the development of BI and SW can be credited to transactional processes among these factors. Importantly, the social evaluation and developmental outcomes of BI and SW differ depending upon proximal family and peer contexts as well as broader socio-cultural contexts (Chen & French, 2008;

Chen et al., 2011). Thus, throughout this article, important, recent research is highlighted, which documents the development and consequences of these behaviors across cultures. The article concludes with an outlook on future directions in the field.

Sub-types of Social Withdrawal

Various sub-types of SW have been identified, each with different causes, correlates, and outcomes. Broadly, sub-types of SW can be categorized along two dimensions—a motivation to approach and a motivation to avoid (Asendorpf, 1990). The term *shyness* has been used to refer to a form of SW characterized by anxiety or self-consciousness in novel social situations, especially situations in which one believes he or she is being evaluated (Asendorpf, 1990; Coplan et al., 2013). Shy children often exhibit *reticent* behavior—watching others interact from the periphery but not directly engaging in social interaction (Coplan et al., 2013). These children may loom near or play beside other children, but tend to not initiate interaction with unfamiliar people, and are wary when approached by unfamiliar others. Thus, these children are often described as experiencing an *approach-avoidance conflict*—they want to interact with others, but remove themselves from direct involvement because of the anxiety or distress social situations provoke.

Socially-avoidant children tend to experience extreme fear and anxiety in the face of social interaction and thus have an especially strong avoidance motivation (Asendorpf, 1990; Coplan et al., 2013). Unlike shy children, socially-avoidant children have a low approach motivation and less often demonstrate reticent behavior. Their aversion to social interaction leads some socially-avoidant children to behave aggressively and impulsively in social situations, and because of their disruptive behavior and negative affect, these children are at higher risk for peer rejection. *Unsociable* or *socially-disinterested* children prefer to play alone, but are not particularly anxious or socially disruptive, and are comfortable interacting with others if others initiate the interactions (Asendorpf, 1990; Coplan et al., 2013). Whereas shy children are often attentive of others' social interactions, unsociable children are more focused on

objects, such as toys. Thus, these children can be described as having neither a strong motivation to approach nor a strong motivation to avoid social situations.

SW traditionally refers to children's own (internal) motivation to disengage from direct social involvement. This should be distinguished from *active isolation* (also referred to as *active withdrawal*), which describes social isolation resulting from peer rejection (Asendorpf, 1990; Harrist et al., 1997; Rubin et al., 2009). Although active isolation does not necessarily reflect an individual's motivation to socially disengage, SW—especially SW characterized by high levels of negative affect and socially-disruptive behavior—may eventually lead to peer rejection and thus active isolation (Coplan & Rubin, 2010; Rubin et al., 2009).

In the following sections, the term "social withdrawal" will be used to refer generally to removal of oneself from social interaction, for one reason or another. When the empirical literature explicitly indicates which specific sub-types of SW were examined (e.g., shyness), those sub-types are noted.

Measures of Behavioral Inhibition and Social Withdrawal

Researchers use a variety of methods to measure BI and SW (Coplan & Rubin, 2010; Rubin et al., 2009). These methods include questionnaires on which parents or teachers rate the frequency or magnitude of children's behavior along several dimensions, including BI or SW. Parents' and teachers' evaluations have the advantage that they reflect children's behavior across a wide time-span (e.g., a year in the classroom, or a lifetime) and, especially in the case of parent questionnaires, across a variety of contexts (e.g., at home, in public). Yet, such questionnaires are subject to biases; parents especially may rate their children more positively and more consistent with social norms. Researchers have additionally used peer-ratings, whereby children in a classroom identify which of their peers they consider to be shy, friendly, aggressive, and so forth. Both teacher and peer evaluations may be less biased than parent ratings, but are limited in that only classroom behavior is typically considered in the evaluations.

Researchers also directly observe children's behavior in their homes, with peers in their classrooms, or with other children and adults in research laboratories. One of the most widely used measures of BI, developed by Kagan and colleagues, involves having toddlers or preschoolers and their caregivers in a room with novel stimuli (e.g., toys, people); investigators record children's reactions—their fear toward, approach toward, and interaction with the novel stimuli, and their tendency to seek their caregivers for comfort. These measures are more objective than parent ratings, but are limited in that children's behavior is often observed across a narrow time-span and within a limited context (e.g., an hour in the laboratory). Recently, self-report measures have been used to gauge SW among older children; these measures have the potential to more fully capture the personal motivations behind individuals' SW, but are subject to self-report biases (e.g., to portray oneself positively). Studies that have used several of these methods have revealed modest to strong correlations among measures (Rubin et al., 2009). Importantly, such studies have also identified that measured inhibition varies depending upon the context in which it is assessed and depending upon whom performs the evaluations.

Development of Behavioral Inhibition and Social Withdrawal: A Transactional Process

Developmental precursors to BI and SW can be found in early infancy. Reactivity—one's physiological and behavioral response to stimulation—is a strong predictor of BI and SW (Kagan, 1997; Rothbart et al., 2011). Kagan and colleagues found that more reactive 4-month-olds in the U.S.—i.e., those who moved and cried more when they were stimulated by toys, faces, and voices—demonstrated greater fear toward unfamiliar events at 1- and 2-years of age, when compared to non-reactive children (Kagan, 1997; Kagan & Snidman, 1991). Children who had been classified as fearful/inhibited toddlers talked and smiled much less than their peers at 4-years; at this age many of these children would be considered socially withdrawn. Moreover, inhibition during infancy and early childhood is predictive of SW in late childhood, adolescence, and early adulthood; and this has been found in a variety of cultures

(Fox et al., 2005; Rubin et al., 2009). Extremely withdrawn children are particularly likely to demonstrate a stable pattern of SW across development (Rubin et al., 2009). However, only a small portion of children maintain an extreme form of a reactive/inhibited profile across development; instead it is more common for children to regress towards the mean—e.g., for extremely reactive infants to develop into somewhat timid children (Kagan, 1997). Thus, early BI is predictive of later SW, and SW in early childhood is predictive of SW throughout development. Moreover, SW is relatively stable across contexts—children with extreme SW in particular tend to exhibit such behavior towards their peers in a variety of settings (e.g., at home, in school, at community events).

Findings that developmental precursors to BI and SW are present very early in life, that inhibited individuals often remain so throughout development, and genetic studies demonstrating the heritability of inhibited behavior, all point to the strong biological bases of BI and SW (Fox et al., 2005; Kagan, 1997; Kagan & Snidman, 1991). However, relations between biology and behavior are not straight-forward— early cognitive and behavioral dispositions interact to predict SW. For example, among U.S. children, Pérez-Edgar et al. (2011) found an association between early BI (at 2-3 years) and later SW (at 5 years) only among children who paid the greatest attention to threatening stimuli—those who stared longest at angry faces during a laboratory task.

Children's environments, including the broader culture and the more proximate family and peer contexts, also shape the development of inhibited behavior as well as the psychosocial consequences of such behavior (Chen & French, 2008; Chen et al., 2011; Oh et al., 2008). Indeed, recent research has demonstrated that biological, cognitive, and environmental factors interact to shape children's BI and SW and mutually influence the developmental outcomes of these behaviors. Thus, the development of these behaviors and their outcomes can best be described as functions of complex transactions between internal factors (biology, cognition) and environmental factors (other people)—infants' biologically-driven reaction to novel entities influences how other people respond to infants, which in-

turn shapes children's biological, emotional, and cognitive development, which then further shape

children's environments (Rubin et al., 2009). This reciprocal, transactional process continues throughout

the lifespan. Thus, even though there is moderate stability in BI and SW across development (Kagan,

1997; Rubin et al., 2002), environmental and cognitive factors influence the prevalence and outcomes of

these behaviors.

Biological Correlates of Behavioral Inhibition and Social Withdrawal

Inhibited behavior is associated with several neurophysiological systems and processes,

including the limbic system, autonomic nervous system (ANS), hypothalamic-pituitary-adrenal (HPA)

axis, and prefrontal cortex (PFC). The amygdala is a medial temporal lobe structure involved in the limbic

system. This structure plays an important role in processing emotional sensory information, including

others' facial expressions—especially negative expressions, such as fear—and auditory stimuli

associated with danger or with anger. How the amygdala processes potentially threatening stimuli

influences regulation of both the ANS—via the amygdala's projections to the hypothalamus—and the

HPA axis; and this has implications for BI and SW (Fox et al., 2005; Kagan, 1997; Lopez et al., 2004).

The ANS is composed of the sympathetic nervous system (which regulates "fight or flight"

responses to threat) and the parasympathetic nervous system (which calms the body down following a

threat). The high reactivity typical of shy individuals might be partly attributable to over-activation of the

sympathetic nervous system or to poorer functioning of the parasympathetic nervous system (Kagan,

1997). Indeed, studies have demonstrated that behaviorally-inhibited toddlers and young children tend

to have higher resting heart rates—an indicator of ANS activation—and resting heart rate is a predictor

of SW in the preschool years (Fox et al., 2005; Kagan, 1997).

The HPA axis is also responsible for regulating humans' response to stress. When an individual

encounters stressors, the HPA axis produces hormones which activate other neural systems, eventually

leading to the release of cortisol by the adrenal glands; cortisol, in turn, regulates the physiological

response to the stressors. Thus the level of cortisol found in saliva, urine, or blood is commonly used as a marker of individuals' level of physiological stress. Many studies have found a positive association between children's daily resting cortisol levels and SW (Lopez et al., 2004). For example, Blair et al. (2004) found that children who were rated as having both high approach and high withdrawal motivations (i.e., a typical characterization of shy children caught in an approach-avoidance conflict) had both higher resting heart rates and higher cortisol levels. One prominent hypothesis is that some withdrawn children experience consistently high levels of stress (reflected in their heart rates and cortisol), leaving them with a relatively low threshold for additional social stress. Thus, rather than socially engage, these children withdraw from social situations in an attempt to avoid additional stress (Fox et al., 2005; Lopez et al., 2004).

The PFC is involved in a host of cognitive processes. Critical to SW is the role of the PFC in regulating emotion and behavior (Fox et al., 2005; Lopez et al., 2004). Generally, the left regions of the PFC are involved in processing positive emotions and approach-oriented emotional responses, whereas the right regions are involved in processing negative emotions and withdrawal-oriented emotional responses. Cerebral asymmetry in processing emotions, specifically more marked activation of the right hemisphere relative to the left hemisphere (i.e., "right frontal asymmetry") is linked to BI and SW. Inhibited infants, preschoolers, and older children show greater right frontal asymmetry, whereas outgoing infants and children show greater left frontal asymmetry (Fox et al., 2005). Lopez et al. (2004) have proposed that right frontal asymmetry might reduce signals that the PFC sends to decrease activation of the amygdala, which would in turn maintain HPA axis activation. The PFC also plays a role in regulating individuals' behavioral responses to physiological and environmental stimulation, and thus could directly influence whether and how individuals' SW manifests (Rothbart et al., 2011).

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Behavioral Inhibition and Social Withdrawal in Social Contexts

Cultural Influences on Behavioral Inhibition and Social Withdrawal

Different behaviors are favored in different cultural contexts, and social expectations about shy or reserved behavior vary markedly between cultures (Chen & French, 2008). These social expectations influence the prevalence of BI and SW, the ways inhibited individuals are treated by others, and their psychological health.

Cultural values influence people's attitudes towards social behavior. Broadly, many Western societies, such as the U.S. and Canada, highly value individualist behaviors including autonomy and assertiveness, while many East Asian and Latin American societies place greater emphasis on collectivist behaviors, such as self-control and actions that facilitate group harmony (Triandis, 1995). Individualist and collectivist values coexist in most cultures, but the relative balance of these values within cultures can help us understand the development, prevalence, evaluation, and adjustment outcomes of BI and SW across cultures.

Cultural values can influence the development and consequences of children's BI and SW through several pathways. First, cultural values shape parents' socialization goals for their children. Second, children adopt existing cultural norms for social behavior and apply them when they respond to peers' SW (Chen & French, 2008). Thus, the prevalence of BI and SW will vary depending upon cultural values, as parents and peers either facilitate or discourage their development. For example, during laboratory free play sessions, toddlers in more collectivist East Asian countries, such as Korea and China, show more inhibited behavior than do toddlers in more individualist cultures, such as Italy and Australia (Rubin et al., 2009).

Behavior Inhibition and Social Withdrawal in Parent-child Relationships

The quality of the parent-child attachment relationship is strongly associated with the development of BI and SW. In the U.S., infants with insecure attachments to their primary caregivers are

more likely to exhibit BI during toddlerhood and are more likely to exhibit SW in the preschool- and school-age years (Hastings et al., 2010). Similarly, urban Chinese school-age children's self-reported insecure attachment with their caregivers is associated with SW, whereas secure attachment is associated with greater social initiative (Chen, 2012). These findings suggest that feelings of mistrust and fear derived from an early insecure attachment might influence the development of SW. Children's SW can also affect the parent-child attachment relationship. For example, inhibited children's high arousal and wariness tend to elicit extremely solicitous (i.e., physically close and controlling) parenting, which may contribute to an insecure attachment relationship.

Mothers' affect, personalities, and parenting styles are closely linked to shy children's socio-emotional adjustment. For instance, mothers' negative affect and neuroticism are linked to increased internalizing problems and social dissatisfaction among shy preschoolers. Parents with neuroticism are more likely to adopt an overprotective parenting style especially when their children are shy because such parents are more likely to see their children's behavior as problematic and in need of correcting (Rubin et al., 2009). Overprotective parenting can discourage independence and reduce opportunities for children to develop coping skills and problem solving strategies, which can be especially problematic for withdrawn children. Overprotective parenting is predictive of inhibited preschoolers' shyness and reticence in the U. S. and in Korea, and is predictive of peer difficulties and internalizing problems among Canadian kindergarteners (Hastings et al., 2010; Rubin et al., 2009). Other studies have found that parents' perceptions of their toddlers' shyness predicts overprotective parenting in the following years. Collectively, the findings just reviewed indicate that there are bi-directional relations between children's shyness and parental behavior across development (Rubin et al., 2009).

Certain qualities of parents and parenting styles can facilitate the positive development of shy children. For example, Canadian mothers' agreeableness—their competence in regulating their own emotions—is associated with fewer internalizing problems and peer difficulties among shy

kindergarteners (Rubin et al., 2009). Agreeable mothers tend to display higher parental warmth and responsiveness, and are able to assist in their shy children's emotion regulation; such parenting mitigates the links between shyness and negative adjustment outcomes. Thus, parental reactions to children's early dispositions influence children's developmental trajectory to SW and influence adjustment outcomes for withdrawn children.

How parents evaluate and respond to children's SW varies across cultures. In general, parents in individualist cultures tend to view SW negatively and associate such behavior with submissiveness, dependency, and timidity (Rubin et al., 2009); whereas parents in collectivist cultures evaluate SW more positively as a sign of respectfulness and self-control (Chen & French, 2008). There is a growing recognition, however, that strong individualist and collectivist values co-exist within some societies (e.g., Cheah & Park, 2006; Hastings et al., 2010). This seems to be particularly the case in Westernized Asian cultures such as South Korea, urban China, and India (e. g., Bowker & Raja, 2011; Kim et al., 2008). In these changing societies, parental attitudes, socialization goals, and parenting strategies seem to reflect both traditional Asian values and Western values. For example, whereas Korean culture is rooted in a traditional collectivist ideology, the Korean War and industrialization brought with them an emphasis on the success of one's own family, which encouraged greater competition. These recently adopted Western values are reflected in contemporary Korean mothers' negative view of their children's SW (Cheah & Park, 2006). Moreover, Korean mothers prioritize child-centered goals when trying to promote their social behaviors (e.g., making children feel good about themselves, trying to understand children's perspectives), which also reflects individualist values. Korean mothers, however, attribute their children's SW to external causes, which reflects the traditional collectivist ideology that personalities are largely products of environmental factors rather than innate factors. Thus, in the context of socio-cultural shifts, changing cultural norms are reflected in parents' attitudes about children's SW as well as in their parenting goals and strategies (Hastings et al., 2010).

Behavioral Inhibition and Social Withdrawal in Peer Relationships

Peer relationships are one of the main socializing settings for children, and children's behavior among peers provides a meaningful indicator of their social competence. Withdrawn children are more likely than sociable children to experience neglect and rejection by peers, and to be victimized through chronic bullying by their peers (Rubin et al., 2009). One potential reason for this rejection is that peers view withdrawn children as not complying with age-specific behavioral norms. Another possibility is that withdrawn children lack age-appropriate social skills and are seen as easy targets for victimization (Rubin et al., 2009).

Peer interactions deserve special attention because they are not only affected by the unsociable behavior of withdrawn children but can also influence the developmental trajectory of children's SW. Oh et al. (2008) identified groups of U.S. children with different developmental trajectories for SW across the period from fifth grade to the final year of middle school: *low stable* (children who were not classified as withdrawn at any point in the study), *increasing SW*, and *decreasing SW*. Children who experienced high levels of peer exclusion and victimization were more likely to be categorized as withdrawn in fifth grade. Increased SW over the subsequent years was predicted by friendship instability, the absence of a mutual best friend, or having a best friend who was highly socially withdrawn. Decreased SW was predicted by decreased rejection and peer victimization during the transition to middle school. These findings suggest that having a positive peer context and having friends who model more outgoing behavior may encourage socially withdrawn children to engage in social interaction, effectively reducing their SW.

Norms for peer interaction vary across cultures, and thus how peers respond to BI and SW differs across cultures. For example, shy children in China are viewed less negatively by peers than shy children in the U. S. and in Canada (Chen & French, 2008). In addition, cultural shifts across history have yielded cross-cohort differences in how adaptive these behaviors are. For example, researchers have

found that social adjustment outcomes vary between cohorts of shy elementary school children in urban China (Chen & French, 2007). Shyness was associated with positive outcomes—such as peer acceptance and leadership—in a 1990 cohort, but with negative peer reputation and school maladjustment in a 2002 cohort., Similar to what has been found in other Asian countries, recent social and economic changes in urban China have introduced individualist values such as self-assertion, and this has led people to view inhibited behaviors as suboptimal in the new competitive environment. In rural areas of China, however, where less dramatic economic and cultural changes have taken place, strong traditional collectivist values persist and shy children continue to experience a positive reputation among peers (Chen et al., 2011).

Each of the sub-types of SW may be evaluated differently by peers. Coplan et al. (2007) examined how young Canadian children perceived SW when presented hypothetical vignettes describing the behaviors of shy, unsociable, aggressive, and socially-competent children. They found that as early as kindergarten, children distinguished between the different motivations behind SW, and preferred a shy playmate over an unsociable playmate. Similarly, Chen et al. (2011) found differences in the social adjustment of unsociable and shy school-age children in rural China; unsociability was linked with peer rejection, whereas shyness was associated with peer- and teacher-rated social competence.

Emotional and Cognitive Outcomes of Behavioral Inhibition and Social Withdrawal

Self-concept and Coping

Children identified as extremely shy or avoidant tend to experience many social difficulties, such as neglect and peer rejection. Due to frequent negative peer interactions, withdrawn children tend to attribute their social failures to internal factors rather than to their peers or to contextual factors (Wichmann et al., 2004). Consequently, these children are at a greater risk for developing a poor self-concept. Moreover, withdrawn children commonly use avoidant coping strategies—such as doing nothing, rather than active problem-solving—when they are faced with challenging social situations

(Markovic et al., 2013). Researchers suspect that the main obstacles to proactive coping for these children are over-arousal in social situations and self-defeating appraisals of their social skills. Such negative appraisals and low self-esteem can contribute to the development of internalizing problems.

Internalizing Problems

Many studies across cultures have found that early BI and SW are associated with internalizing problems, such as anxiety, depression, and loneliness. The relation between SW and anxiety can be considered transactional—one can reinforce the other and therefore the association between the two often persists longitudinally. SW and depression have also been associated in many studies; this might be due to withdrawn children's lower self-esteem, loneliness, or their use of avoidant coping strategies. For example, a longitudinal project in Canada found that childhood SW predicted loneliness and depression in adolescence (Rubin et al., 2009). In a study following Norwegian children from infancy to early adolescence, SW was contemporaneously and longitudinally linked to anxiety and depression (Karevold et al., 2012).

Psychological outcomes vary depending upon the sub-type of SW and the cultural context. Among the different subgroups of withdrawn school-age children in Canada, Coplan et al. (2013) found that avoidant children reported the highest levels of social anxiety and depressive symptoms, shy children reported moderately high levels of social anxiety and depressive symptoms, and unsociable children reported levels comparable to non-withdrawn children. A different pattern was found among school-age children in rural China, where strong traditional, collectivist values are held: unsociability, but not shyness, was associated with depression (Chen et al., 2011). Thus, whether a specific sub-type of social withdrawal is adaptive depends upon the cultural context.

Interesting associations between SW and psychological adjustment are found in Westernized Asian cultures, where people engage in some individualist behaviors within traditional collectivist contexts. Among Korean college students, shyness during adolescence is only weakly associated with

emotional distress, reflective of the collectivist context; and unsociability is not related to relational difficulties or to emotional distress in college, which is consistent with the pattern found in individualist cultures (Kim et al., 2008). These findings suggest that as long as children's preference for solitude does not disrupt group harmony, it might not compromise their socio-emotional adjustment in such societies. Bowker and Raja (2011) found a similar pattern for unsociability among Indian adolescents, but additionally found that social avoidance was associated with loneliness. Avoidance strongly contrasts with the collectivist value of group cohesion and thus might be especially maladaptive in such cultural contexts.

Finally, evidence suggests that links between SW and psychological adjustment vary by gender in Western societies. Withdrawn boys are at a greater risk for negative outcomes; they are more likely to be excluded by peers and experience socio-emotional difficulties across the lifespan compared to withdrawn girls (Rubin et al., 2009). This gender difference might be partly due to the differences in cultural and parental expectations for boys and girls; BI and SW are seen as less socially acceptable for boys than for girls in Western cultures.

Social Cognition

From an evolutionary standpoint, researchers have recently proposed that a reserved approach to novelty, including social novelty, might have provided the foundation on which humans were capable of making significant social-cognitive advances, including advances in their understanding of how others think, their theory-of-mind (ToM). Indeed, human toddlers are more cautious toward novel stimuli compared to humans' closest primate cousins—bonobos, chimpanzees, and orangutans (Hermann et al., 2011)—all of which young children surpass in social-cognition. Researchers have started to directly examine relations between SW and the ontogeny of social-cognition, and have demonstrated that some forms of SW are related to more advanced social-cognition in children.

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Harrist and colleagues (1997) used teacher ratings of U.S. children's behavior to identify a group

of non-withdrawn children, as well as sub-groups of withdrawn children, including those who were

unsociable, shy (whom Harris et al. term *passive-anxious*), and actively-isolated. Social-cognition was

measured by presenting children hypothetical situations in which they were rejected or ignored when

trying to enter a social group or in which another child bothered them. For each situation, children were

asked, among other things, to recall the situation and to judge whether the story characters were acting

mean (such judgments are called "hostile attributions"). Kindergarteners who were categorized as

actively-isolated—who were more impulsive, angry, and defiant—had the poorest recall of the

situations compared to other withdrawn and non-withdrawn children; and during elementary school

these children made more hostile attributions than the other withdrawn children. In contrast,

unsociable children and shy children made fewer hostile attributions during elementary school, even

when compared to non-withdrawn children.

Wellman et al. (2011) examined relations between dimensions of U.S. preschoolers'

temperament—including shyness, perceptual sensitivity, and aggression—and their ToM. When children

were age 3-years and 5-years, parents completed questionnaires about their children's behavior, and

children were given ToM tasks in the laboratory. For the ToM tasks, children were presented scenarios

where a character holds a false belief and children were asked to predict and explain characters' beliefs

and behavior. Wellman et al. (2011) found that children who were shyer, more perceptually-sensitive

and less aggressive at age 3 had a more advanced ToM at age 5. Thus SW may have advantages; shy

children, especially those who are non-aggressive and socially attentive, may learn more about others

by watching from the periphery of social interaction, compared to their non-shy peers.

Lane et al. (2013) assessed relations between different forms of SW and ToM in two cultures

that differed in their social norms concerning shyness: the U.S. and China. Two types of children were

identified using parent ratings of SW and data on children's HPA axis reactivity (gauged via salivary

cortisol). Withdrawn children with lower HPA reactivity evidenced more advanced ToM (gauged with false-belief tasks). However, withdrawn children with relatively high HPA reactivity evidenced poorer ToM. Parents' ratings of children's behavior along other dimensions helped to further distinguish the two groups. Withdrawn/high-reactive children had poorer perceptual sensitivity, poorer inhibitory control, and lower levels of smiling and laughter than other children; thus these children would fit the profile of disruptive, socially-avoidant children. In contrast, withdrawn/low-reactive children did not differ from non-withdrawn children on these other dimensions; thus these children would fit the profile of shy children.

Lane et al. (2013) found that the social-cognitive differences between these two groups were especially marked for Chinese children—withdrawn/low-reactive (i.e., shy) children were especially likely to outperform withdrawn/high-reactive (i.e., disruptive and avoidant) children. As discussed earlier, this likely reflects cultural differences in behavioral norms and expectations. In China, reactive behavior is more discouraged than in the U.S., whereas shy or reticent behavior is more encouraged (Chen & French, 2008). Chinese children in this latter withdrawn group might be more welcomed in or near social situations, providing more and better opportunities to learn about others, enhancing their social cognition (Lane et al., 2013).

Suway et al. (2011) assessed how U.S. 2-year-olds' BI and peer interaction jointly predict their ToM at 3 years. BI was measured by observing children's behavior while they were introduced to novel stimuli. Children's peer interactions were measured by pairing each child with an unfamiliar peer; the two engaged in collaborative tasks and the child's negative behaviors (e.g., grabbing, demanding) were recorded. Among children with fewer negative peer interactions, BI at age 2 was unrelated to their ToM (essentially, false-belief understanding) at age 3. However, among children with more negative peer interactions, BI at age 2 predicted poorer ToM at age 3. Consistent with the findings of Harrist et al.

(1997) and Lane et al. (2013), these latter children appear to fit the profile of disruptive, socially-avoidant children who have poorer social cognition.

To summarize, a shy, reticent temperament appears to promote social-cognitive development, perhaps because shy children spend more time observing others interact and reflecting upon what they observe. In contrast, withdrawal that reflects greater reactivity and which is characterized by more aggressive, disruptive behavior might undermine social-cognitive development by compromising the quality of the social interactions in which children engage and observe.

Future Directions

Research over the past several decades has focused heavily on social and emotional difficulties associated with BI and SW. Yet, recent studies suggest that there are also benefits associated with SW. For example, BI in infancy predicts better effortful control during the preschool years (e.g., Rothbart et al., 2011), and SW is associated with greater prosocial behavior during the elementary-school years (Oh et al., 2008). Recently, research has documented more advanced, or at least precocious, social-cognition among shy preschoolers compared to their non-shy peers. Such work should inspire additional research on cognitive, emotional, and social advantages associated with BI and SW. Given the importance of social-cognition in our daily interactions with others, it is worthwhile for researchers to examine whether precocious social-cognitive abilities translate to greater social competence for these shy children. Research is also needed to examine whether relations between shyness and competencies such as effortful control and social-cognition are specific to the preschool years or whether there are more long-term advantages to having a shy temperament.

Studies on cultural variability in the prevalence and developmental outcomes associated with BI and SW have increased over the past decade. Yet, as is the case with much cross-cultural research, these studies are limited to a select group of countries—namely, those in North America, Western Europe, and East Asia—that have the academic and research infrastructures to easily support these sorts of

investigations. This means that still relatively little is known about BI and SW within, for example,

cultures in South America, Africa, and the Middle East. Research with other cultures would serve to

further evaluate hypotheses regarding cultural influences upon social development. A particularly

interesting avenue for research involves tracking the development of BI and SW in countries that are

undergoing socio-cultural shifts and increasingly incorporating the values and norms of other cultures.

Finally, more research is needed to examine the influence of demographic variables (e.g., parents'

education, family income) on parents' perceptions of and reactions to children's behavior; this research

would likely shed light on intra-cultural differences in the development of BI and SW.

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