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Siblings of Youth with Autism Spectrum Disorders: Theoretical Perspectives on Sibling Relationships and Individual Adjustment

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Abstract

A burgeoning research literature investigates the sibling relationships of youth with Autism Spectrum Disorder (ASD) and their implications for individual adjustment. Focusing on four relationship domains-- behaviors, emotions, cognitions and involvement—and toward advancing this generally atheoretical literature, we review and apply tenets from a range of theoretical perspectives in an effort to illuminate the mechanisms underlying sibling relationship experiences and their adjustment implications. Our review suggests new directions for research to test theoretically-grounded hypotheses about how sibling relationships develop and are linked to individual adjustment. In addition, we consider how identifying underlying bio-psycho-social processes can aid in the development of interventions to promote warm and involved sibling relationships and positive youth development.

Keywords

Sibling Relationships; Youth Adjustment; Family; Close Relationship Theory; Prevention; Intervention

Sibling relationships are unique and have unique implications for individual development and adjustment. Siblings can influence one another directly, such as in their roles as companions and playmates and when they provide or receive caregiving and support (McHale, Updegraff & Whiteman, 2012). As social partners, siblings also afford

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opportunities for developing social competencies such as perspective taking, conflict resolution, and communication skills (Dunn, 2007). Sibling relationships vary considerably, however, and can also serve as a training ground for learning coercive, aggressive, and other deviant behaviors and (Bullock & Dishion, 2002; Patterson, 1984), and a gateway to risky behaviors such as delinquency and substance use (Brook, Whiteman, Brook & Gordon, 1991). In addition to their direct influences, siblings affect one another indirectly by their effects on larger family dynamics, as when they take on family roles such as peacemaker or scapegoat (Ansbacher & Ansbacher, 1956), dilute family resources (Downey, 2001), or serve as a focus for social comparison and parents' differential treatment (Shanahan, McHale, Crouter & Osgood, 2007) or a source of family stress (Patterson, 2002).

In short, through their daily contact and experiences growing up together, and because sibling relationships are the longest lasting relationships in most individuals' lives, siblings have substantial opportunity to influence one another's development. Their shared history means that siblings can develop deep and unique understandings of one another and remain fixtures in one another's lives-- sources of security and support, rivalry and antagonism or disaffection and indifference-- across the lifespan.

Recognition of substantial variability in sibling relationships, sibling-related family dynamics, and sibling influences on individual development among typically developing siblings provides a context within which to understand the experiences of youth whose siblings have Autistic Spectrum Disorder (ASD). The literature on typically developing siblings (TDSibs) whose sisters or brothers have ASD (ASDSibs) emerged from a body of research on families with children with disabilities and chronic illnesses (Stoneman, 2005). Rapidly rising rates of ASD, however-- evidence suggests an increase in diagnosis rates of 289.5% between 1997 and 2008 (Boyle, et al., 2011)--have led practitioners, parents, and researchers to raise questions about the potentially unique issues that arise in families with a child with ASD. Indeed, studies have focused increasingly on the experiences of youth with ASDSibs, with some extending to adult TDSibs (Orsmond & Seltzer, 2007a). Suggestive of the breadth of interest, this work has been reviewed in disciplines including nursing (Smith & Elder, 2010), psychology (Orsmond & Seltzer, 2007b; Shivers, & Plavnick, 2014), special education (Ferrailoi & Harris, 2010; Meadan, Stoner, & Angell, 2010), and family science (Tsao, Davenport, & Schmiede, 2012), with a focus on (a) adjustment in TDSibs, and (b) characteristics of sibling relationships.

These reviews provide for some general conclusions about the nature of ASD-TDSib relationships and their implications for TDSibs' adjustment, but also highlight substantial inconsistencies. Relationships of ASDSibs have been described as generally positive; they also may involve less conflict, but less warmth and involvement than those of typically developing siblings (Kaminsky & Dewey, 2001; McHale, Sloan, & Simeonsson, 1986; Orsmond, Kuo & Seltzer, 2009) and distress in response to the ASDSib's aggressive and disruptive behaviors (Mascha & Boucher, 2006). With respect to adjustment, youth with ASDSibs are generally well-adjusted and some may benefit from their experiences in their social competencies and self concept (Kaminsky & Dewey, 2002; Macks & Reeve, 2007; Pilowsky, Yirmiya, Doppelt, Gross-Tsur, & Shalev, 2004; Verte, Roeyers & Buysse, 2003), but there also is evidence of adjustment problems in TDSibs (Hastings, 2003; Shivers,

Deisenroth, & Taylor, 2013). Reviews target research designs and methods as a basis for inconsistencies across studies (Hodapp, Glidden & Kaiser, 2005; Meadan et al., 2010): Small sample sizes, samples of convenience, inattention to family structure, samples that differ in comparison group, age, and data sources mean that it is difficult to compare results across studies. Together, however, this literature suggests *substantial variation* in the sibling relationships and adjustment of TDSibs and directs attention to two questions: (1) *How* do TDSibs and ASDSibs develop involved and affectionate relationships? And, (2) *How* do relationship experiences shape the adjustment of both TDSibs *and* ASDSibs?

Toward a translational research agenda aimed at promoting positive sibling relationships and individual adjustment for TDSibs and ASDSibs, the goal of this paper is to begin to fill the theoretical void that is a key limitation of the literature on ASDSibs and siblings with other kinds of developmental disabilities (Stoneman, 2005). Their complex and multifaceted nature means that sibling dynamics can be best understood via a multi-disciplinary approach. Thus, we draw from social learning, ethological/psychoanalytic, developmental and social psychological, and sociological, anthropological and systems theories in an effort to illuminate the hows and whys of sibling relationships and their influences, and argue for a research agenda to test integrative hypotheses in empirical investigations. Building on a model developed by Feinberg, Sakuma, Hostetler and McHale (2013) that served as the foundation for an evidence-based program for promoting relationships between typically developing siblings, *SIBlings are Special (SIBS)*, we consider four interrelated dimensions of sibling dynamics: *behaviors, emotions, cognitions* and *involvement*. In sections that follow, we describe relevant theories and illustrative empirical literature on both typically developing and TDS-ASD sibling relationships. A developmental perspective implicates childhood and adolescence as periods when socio-emotional orientations and relationship patterns are established. Further, given the limited literature on adults siblings, we focus on youth's experiences in childhood and adolescence, but where relevant, incorporate insights from studies of siblings in adulthood—a key direction for research.

Theoretical Perspectives on Sibling Relationship Behaviors

Overview of Empirical Research

Among typically developing siblings, research on *positive sibling relationship behaviors* focuses on helping, teaching and caregiving, provision of advice, support, and warmth, and sharing and turn-taking in play (Dunn, 2007). Longitudinal studies reveal that these behaviors decline across adolescence as youth focus on the world beyond the home (Kim, McHale, Osgood, & Crouter, 2006). Positivity in sibling relationships, however, continues to be linked to more positive psychological adjustment into young adulthood and beyond (Voorpostel & van der Lippe, 2007). *Sibling conflict* behaviors include verbal (tease, argue), relational (social exclusion, undermining) and physical aggression (Dunn, 2007). Sibling conflict is common—up to eight times per hour in childhood, as is aggression, with more than half of siblings engaging in physical violence (Berndt & Bulleit, 1985; Steinmetz et al., 1981). Sibling conflict also affects other family subsystems. For example, sibling conflict is most parents' number one child rearing concern (Perlman & Ross, 1997). Importantly, positivity and negativity are not opposite ends of the same continuum: The same

relationships can include *both* high negativity and frequent engagement and support (McHale et al., 2012)

Our review yielded studies of positivity and conflict in TDSib-ASDSib relationships that compared these relationships to those of typically developing siblings and to siblings with other kinds of disabilities. Acknowledging the difficulty of generating matched comparison groups, findings suggest that the relationships of siblings with ASDs and other disabilities may involve less conflict (Kaminsky & Dewey, 2001; McHale et al., 1986). Positive sibling behaviors, however, also may be less frequent (Pollard, McNamara, Freedman, & Kotchick, 2013; Knott, Lewis, & Williams, 2007). Longitudinal data on TDSib-ASDSib relationships are rare, but combined with cross-sectional findings, suggest declines in positive sibling exchanges as contact between siblings decreases from adolescence through middle adulthood (Hodapp & Urbano, 2007; Orsmond & Seltzer, 2007b). Importantly, experimental interventions reveal that TDSibs can be trained in teaching and helping behaviors, and that these experimentally induced changes spill over to promote more positive sibling involvement (Shivers & Plavnick, 2015). Together, findings suggest that sibling relationships are highly variable, underscoring the need to identify individual, family, and larger contextual factors that shape siblings' behaviors.

Social Learning Perspectives on Sibling Relationship Behaviors

Most literature on positive and conflictual sibling behaviors is grounded in *social learning theories*. Patterson (1984) described how sibling conflict and aggression emerge and escalate through social reinforcement processes, as when a child positively reinforces a sibling by “giving in” to aggressive or aversive behavior-- and that child is negatively reinforced for giving in because the sibling's problem behavior temporarily ceases. This pattern of reinforcement means that *coercive cycles* escalate in intensity over time. And, behaviors learned in sibling relationships generalize to other settings, meaning that sibling relationships can serve as a training ground for problem behaviors. Thus, TDSibs may inadvertently “train” maladaptive behaviors in efforts to placate their sibling and keep the peace. Further, youth may withdraw from engagement with their siblings when they have no effective strategies for limiting aversive behaviors. Recognizing and managing coercive behavior cycles are a focus of some evidence-based parent education programs (Martinez & Forgatch, 2001), and can be applied to siblings. In the *SIBS* program, a focus is to break cycles of negative sibling exchanges, including by training siblings in social problem solving skills and teaching them to reinforce positive behaviors with compliments and praise (Feinberg et al., 2013).

Although we found no reports of efforts to train TDSibs to manage problem behaviors of ASDSibs, small scale studies show that TDSibs can shape social and adaptive behaviors, that behavior changes are maintained, and that intervention effects spill over to affect TDSibs' evaluations of their sibling (Celiberti & Harris, 1993; Schreibman, O'Neil, & Koegel, 1983; Shivers & Plavnick, 2015). A research direction is to determine whether TDSibs' efficacy in managing their ASDSibs' aversive behaviors promotes their positive sibling relationships and adjustment of both children. Because of their individualized focus, behavior modification programs may be perceived as cost prohibitive. Yet, social skills

training programs (Bierman, 2004; Greenberg & Kusche, 1992) and parent education programs that target social reinforcement (Kazdin, 1997) have proven cost effective, suggesting that these kinds of evidence-based curricula may be adapted to promote positive TDSib-ASDSib behaviors.

Also grounded in social learning theories is research showing that siblings affect one another's development through *deviance training* such as by reinforcing rule breaking and risky behaviors (Bullock & Dishon, 2002). Because siblings spend considerable time together in the absence of supervision, opportunities for sibling deviance training abound. Parental exhortations that more mature siblings set a good example are commonplace in family life, and the behaviors of siblings who take on caregiver roles can benefit from their appreciation of the strength and implications of their influence. The *SIBS* program, for example, included activities and messages about developmental differences between siblings and the importance of older siblings' recognition and appreciation of their roles as positive models (Feinberg, et al., 2013). For higher functioning youths with ASD who struggle to find a place in the peer group, TDSibs should recognize the serious negative implications of serving as the gateway, even inadvertently, to risky activities, including sexual behaviors, substance use and associations with deviant peers.

Observational learning is another social learning mechanism invoked to explain sibling influences. This research highlights sibling influences on risky behaviors (Brook, et al., 1991), but some reveals sibling influences on positive development (Lam, et al., 2012). In this line of work, sibling influences are inferred from findings that the behaviors of siblings are positively correlated, controlling for the shared influence of parent characteristics. Social learning tenets hold that individuals are more likely to imitate models who are high in status, nurturant, and similar to the self (Bandura, 1977). Thus, younger siblings are more likely to model their more mature sisters and brothers than the reverse, and modeling is more evident in warmer sibling relationships and same-sex dyads (McHale et al., 2012).

We know little about modeling processes involving TDSibs and ASDSibs. Shivers and Plavnick (2015) identified only five studies--four with sample sizes of $N = 3$ or less--in which TDSibs served as models to teach specific behaviors to ASDSibs in experimental interventions. Effects were limited, particularly in efforts to promote task-related skills, although one study found that play behaviors learned via sibling modeling generalized beyond the sibling relationship (Reagon, Higbee, & Endicott, 2006). In these studies ASDSibs were mostly young and lower functioning. Thus, research directions on TDSibs as models include extending intervention efforts to higher functioning ASDSibs and to domains wherein siblings may have specialized competencies, such as appearance, social skills and peer relationships (Brewton, Nowell, Lasala, & Goin-Kochel, 2012). Also important is to study the extent to which ASDSibs serve as models for TDSibs: ASDSibs' difficult behaviors may garner considerable time and attention from parents, making them a focus for modeling, particularly by young TDSibs.

Another direction is to examine sibling relationships and modeling including the conditions under which youths are more effective models and the implications of modeling for sibling dynamics. Youths who recognize their role in their ASDSibs' adjustment may develop

feelings of warmth, a sense of efficacy, and inclinations for involvement over the longer term (Ferrailoi, et al., 2012; Shivers & Plavnick, 2015). Some work shows that the socio-emotional development of TDSibs is enhanced relative to youth with typically developing siblings (Macks & Reeve, 2007; Verte et al., 2003), and observing sibling exchanges may shed light on what TDSibs learn from their sibling experiences.

Finally, from a broader family perspective, social learning mechanisms also come into play in *parental influences on sibling dynamics*. For instance, reinforcement and modeling have been invoked to explain links between supportive and conflictual behaviors in parent-child relationships and corresponding behaviors in siblings, and in their marriage relationships, parents may serve as role models for sibling interaction (Kim et al., 2006). Finally, some research has have moved beyond a focus on dyadic parent-child relationships to study parenting of the sibling dyad. Results from an experimental intervention, for example, showed that parents shape their children's social problem solving behaviors around sibling conflict (Ross & Lazinsky, 2014). Social learning processes also may come into play in findings that authoritarian parenting (threats, physical punishment) in response to sibling conflicts is linked to more conflict and less warmth among typically developing siblings (McHale et al., 2002).

Most research on TDSib-ASDsib relationships is based on *between group comparisons*, with those of typically developing dyads relative or those of youths with other kinds of developmental disabilities. We know much less about factors that explain *within-group variations* in the experiences of TDSib-ASDsib dyads. Although factors such as parents' mental health, parenting stress, and social support have been studied as correlates, mediators and moderators of the links between experiences with ASDSibs and TDSibs' adjustment (Hastings, 2003; Orsmond & Seltzer, 2009; Shivers et al., 2013; Sikora, Moran, Orlich, Hall, Kovacs, Delahaye, Clemons, & Kuhlthau, 2013), we found no studies that investigated parent-child relationship correlates of TDSib-ASDsib *relationship behaviors*. Further, beyond research on parents' differential treatment of siblings, discussed in the following section, we found no studies of parenting directed at the TDSib-ASDsib *dyad*. Research on how parents promote positive exchanges and involvement of TD and ASDSibs is sorely needed. Finally, findings of links between marital stress and TDSIB-ASDsib relationship quality (Rivers & Stoneman, 2003) were consistent with social learning tenets and research on typically developing siblings, but more work is needed on the role of family dynamics in TDS-ASDsib relationship behaviors.

In sum, studies of TDSib-ADSib relationship positivity and negativity suggest that social learning perspectives can be usefully applied in understanding sibling relationship behaviors. Moving beyond description, a next step is to apply this knowledge, putting theory to the test in prevention and intervention programs to promote positive involvement and reduce conflict and negativity between siblings, and evaluating the effects of such interventions on the adjustment and development of both TD and ASDSibs. Both siblings and parents may be appropriate targets for intervention: Siblings may develop skills in managing their own and modulating their siblings' behaviors, and parents, strategies for parenting the sibling dyad. Finally, it will be essential to consider the roles of siblings' individual characteristics and the implications of resources and stressors in the larger family context in efforts to promote

positive sibling behaviors. In addition, drawing on concepts from other theoretical perspectives may enhance the effectiveness of intervention efforts that target siblings' behaviors. We turn next to a set of theories whose tenets may be usefully integrated into such intervention efforts—those that focus on the role of emotion in sibling relationship dynamics and influences.

Theoretical Perspectives on Emotion in Sibling Relationships

Although emotions such as anger and warmth are expressed as overt behaviors during siblings' conflicts and positive exchanges, *psychoanalytic/ethological theories* hold that emotions have deeper bio-psycho-social underpinnings. We focus here on *feelings of rivalry and security* in the sibling relationship. Beginning with *sibling rivalry*, Adler's theory of Individual Psychology highlights its role in personality development and adjustment (Ansbacher & Ansbacher, 1956). From this perspective, siblings have different experiences based on their position in the family. Starting in childhood, youth strive against feelings of inferiority that emerge, in part, based on how they are treated by parents—particularly how they are treated relative to their siblings. Indeed, a body of work on typically developing siblings documents links between parents' differential treatment (PDT) and both sibling relationships and youth adjustment. For example, controlling for their dyadic relationships with mothers and fathers, youth who experience less parental warmth or more conflict *relative to their siblings* exhibit less sibling warmth and more conflict, as well as more depressive symptoms and risky behavior (Conger & Conger, 1994; Shanahan, et al., 2007). In this way, feelings of rivalry and what Adler termed, the “style of life” that individuals pursue to compensate for feelings of inferiority, are central to individual emotional development as well as sibling and family dynamics. And, although their underlying feelings may not be recognized or acknowledged, youth's overt negativity toward a sibling may be grounded in rivalry and jealousy that emerge when youth believe their siblings are favored by parents. Building on Adlerian ideas, Schachter and Stone (1987) investigated sibling deidentification processes whereby siblings *differentiate* from one another to establish a unique identity and family niche and reduce sibling rivalry.

Literature on emotion in TDSib-ASDSib relationships has touched on sibling rivalry in discussing how the needs and concerns of the ASDSib may absorb family resources and make demands on TDSibs for caregiving and other responsibilities. For example, youth with ASDSibs and siblings with intellectual disabilities reported poorer relationship quality when they believed their mother showed favoritism toward their siblings (McHale, et al., 1986). Links between children's dissatisfaction with mothers' differential treatment and sibling relationships also emerged in a study of children with ASDSibs (Rivers & Stoneman, 2008). In another study that led to a line of research on moderators of PDT effects, mothers of children with intellectual disabilities exhibited more PDT than did mothers of two typically developing siblings—but PDT was less closely linked to sibling relationship and adjustment problems in families of children with intellectual disabilities (McHale & Pawletko, 1992). We concluded, and later research confirmed that when youth understand the reasons for PDT and/or perceive it to be fair, PDT may no longer give rise to sibling relationship and adjustment problems (Kowal & Kramer, 1998). Such findings qualify claims about the inevitability of sibling rivalry and suggest a target for psycho-educational programs. For

example, the *SIBS* curriculum includes activities aimed at helping siblings understand the reasons why their parents treat them differently and that fairness does not always equate to siblings being treated the same (Feinberg et al., 2013).

Although they may sometimes foster rivalry, inborn drives also may motivate youth to treat their siblings as sources of *emotional security*. Also grounded in an analytic/ethological perspective that stresses the survival value of behavior, attachment theory holds that a central task of development is establishment of emotional bonds (Hazan & Shaver, 1994). Children with secure attachments trust in the sensitive responsiveness of attachment figures, and these figures provide comfort in times of stress as well as a secure base from which children can explore the world to become more autonomous. Attachment relationships develop with a range of significant others, including siblings (Teti & Ablard, 1989). Also suggestive of siblings' role as sources of emotional security are findings that greater sibling warmth and intimacy may emerge in families with more troubled marriages (Kim et al., 2006). Thus, youth may turn to their siblings as sources of emotional support to compensate for problems in other areas of their lives.

Building on attachment theory, Cummings and Davies (1996) targeted emotional security as fundamental to adjustment. The emotion security hypothesis goes beyond attachment theory's focus on innate drives, however, in conceptualizing emotional security as based in systems-wide processes, ranging from the physiological (e.g., hormone-based arousal), to the social-cognitive (e.g., emotion regulation), to the contextual—with a focus on family stressors. Most research on the emotional security hypothesis examines children's responses to parents' marital conflicts, but one, focused on youth who had siblings with disabilities, found that these youth were more reactive to family conflict than those with typically developing siblings: In response to vignettes describing family conflict, they reacted strongly to even low levels of conflict, reported more emotional distress, and perceived more threat and personal responsibility for conflicts than did youth with typically developing siblings (Nixon, Cummings & Davies, 1999). The systems concepts underlying the emotion security hypothesis may provide a foundation for future research on adjustment and family relationships of TDSibs.

We could find no research focused on attachment relationships between TD and ASDSibs. Given TDSibs' roles as caregivers and nurturers (Diener, Anderson, Wright, & Dunn, 2014), and that this role may extend into adulthood (Hodapp & Urbano, 2007), siblings' roles as sources of emotional security may be an important research direction. Consistent with family systems tenets, a shared history of family experiences, family routines and family rituals may help to promote siblings as sources of emotional security because of their connection to what is familiar and valued (Patterson, 2002). Most sibling research has focused on the adjustment and sibling experiences of TDSibs, but we might also expect that issues of felt security would be important for ASDSibs' development. Thus, another research direction is to explore TDSibs' role as a secure base for their ASDSibs and source of comfort in times of stress. Attachment theory and its offshoot, the emotional security hypothesis, require measurement approaches that have not been used in prior research on TD-ASDSib relationships, however. In addition to expanding on the measurement of relationship experiences, longitudinal research is essential to determining how dimensions of

emotion in sibling relationships play out over time and whether they provide a foundation for siblings' long-lasting involvement and well-being. Finally, integrating concepts pertaining to sibling attachment into basic and translational research on TDSib-ASDSib relationship behaviors is an essential next step, as is integrating theory and research in the domains of cognition and involvement that we review in the following sections.

Theoretical Perspectives on Cognition in Sibling Relationships

Social psychological theories highlight how cognitions, including attitudes, expectations, and social comparisons that emerge in close relationships, have implications for close relationships as well as individual well-being. From a cognitive developmental perspective comes the additional idea that such processes are grounded in emerging cognitive abilities that shape and set limits on social understanding. These ideas can provide a foundation for research on developmental and individual differences in TDSib-ASDSib relationships and potential directions for intervention programming. In this section, we begin with an overview of a cognitive developmental approach to youth's relationships, a perspective that was the basis of early sibling relationship research (Dunn, 2007). We then consider perspectives from social psychology, specifically, social comparison theory, equity and social exchange theories, and the theory of planned behavior, which have been applied in research on close relationships--though in keeping with their relative neglect in the literature-- rarely to the study of siblings.

Social Cognitive Development

Research on children's social cognitive skills, highlights abilities such as emotion understanding, perspective taking and social problem solving as key dimensions of social competencies that are essential to satisfying interpersonal relationships. Although this research focuses on peer social competence (Bierman, 2004), studies of sibling relationships reveal that they also serve as a training ground for the development of social understanding: In everyday life, children have strong motivation and substantial opportunity to try out and practice social strategies on siblings—including those that help them get their way and establish their status in the family, and that they can apply skills honed in the sibling relationship in other close relationships (Dunn, 2007; Howe & Recchia, 2014).

Observational research on young siblings reveals that mothers can promote siblings' social understanding: For example, mothers' labeling of siblings' emotions and explanations of their perspectives were linked to more positive sibling relationships (Dunn, 2007). In middle childhood, a parental "coaching involvement" style was associated with more positive sibling relationships (Milevsky, Schlechter, & Machlev, 2011). And as noted, intervention studies by Ross and colleagues documented that mothers can learn to be mediators of sibling conflict: Compared to control group children, middle childhood-aged siblings whose parents participated in sibling conflict mediation training were more likely to ask one another about their feelings and develop plans to resolve conflicts and that conflict resolutions were more likely to take younger siblings' perspectives into account (Ross & Lazinsky, 2014).

Intervention programs for siblings also highlight social cognitive development, particularly social understanding and emotion regulation. The *More Fun with Sisters and Brothers*

Program, focused on 4–8 year old siblings, aimed to promote siblings' social cognition around emotion regulation, and evaluation data revealed that participation in the program gave rise to more positive sibling relationships (Kennedy & Kramer, 2008). In the *SIBS* intervention, siblings learned to recognize and label emotions, including feelings of jealousy in themselves and their siblings, to calm down when experiencing negative emotions, to explain their points of view and listen to their siblings', and to problem solve with their siblings toward "win-win" solutions of sibling disagreements (Feinberg et al., 2013). At post-test, children in the intervention showed higher levels of teacher-rated social competence relative to controls, consistent with the idea that sibling relationships can serve as a training ground for social understanding (Dunn, 2007).

As noted, a handful of studies has included TDSibs in training specific behaviors, primarily in low-functioning ASDSibs. As yet, however, the power of sibling relationships as a forum for developing social understanding has not been harnessed to promote the social competencies of youth with ASD. One popular intervention for TDSibs, *Sibshops*, is directed at building support from peers, knowledge of the ASDSibs' condition and strategies for coping with the ASDSibs' problem behaviors (Meyer & Vadasy, 2008). Building on this work would be intervention research that incorporated elements of evidence-based programs such as *More Fun with Sisters and Brothers* and *SIBS* to promote close and supportive sibling relationships and their collateral effects on both TD and ASDSibs' social competencies.

Social Comparison Theory (SCT)

As noted, parents' differential treatment is seen as fundamental to sibling relationships and youth adjustment from within an ethological/analytic perspective (Ansbacher & Ansbacher, 1956). From a social psychological perspective, SCT theory provides a window into social cognitive processes that help to explain these patterns. Originally proposed by Leon Festinger (1954), SCT posits an innate motivation to evaluate the self in comparison to others, particularly others who are perceived to be similar to the self. Given their shared family background and experiences, siblings are clear targets for social comparison. Central to this inborn motivation system is self-esteem enhancement. Through "downward comparisons" individuals' self esteem is enhanced when they outperform others. Self esteem can sometimes be enhanced through "upward comparisons" when individuals "bask" in the achievement of admired others to whom they are connected, but individuals also may protect their self esteem, by de-identifying with or differentiating from close others whose performance threatens their self esteem (Suls, Martin, & Wheeler, 2002; Tesser, 1980). Few studies have tested the tenets of social comparison theory in the context of sibling relationships, though there is evidence that siblings de-identify in an effort to reduce competition (Schachter & Stone, 1987). Whiteman and colleagues (Whiteman, McHale & Crouter, 2007) asked siblings to rate the extent to which they tried to be like and/or tried to be different from their siblings and found that identification with a sibling was associated with more positive relationships but de-identifying was associated with more relationship negativity.

In the face of their potential significance, we know almost nothing about the role of social comparison processes in the self esteem, identity development, and sibling relationships of youths with ASDSibs. Some research has shown, however, that youth with ASDSibs have more positive self concepts than youths with typically developing siblings (Macks & Reeve, 2007; Verte et al., 2003): High expectations and responsibilities in their family contexts may give rise to a strong sense of self in TDSibs, which in turn, can serve as a source of strength as they face challenges involved in growing up with a sibling with ASD. The literature on the adjustment implications of growing up with an ASDSib is mixed, and thus applying SCT with direct measurement of relevant processes may further understanding of the hows and whys of youths' differential reactions to sibling experiences.

Social comparisons may be relevant to TDSibs in other ways, as well. For example, a number of studies have identified experiences of "stigma" in youth with ASDSibs and their families. Milacic-Vidojevic and colleagues (Milacic-Vidojevic, Gligorovic & Dragojevic, 2014 25) conceptualized stigma as including blame for the ASDSibs' condition, contamination, i.e., that ASDSibs' characteristics spilled over to the TDSib, and pity. Their findings revealed that greater knowledge about ASD was linked to lower levels of TDSibs' stigmatization, suggesting a direction for intervention. Other qualitative studies have identified youths' concerns about others' reactions to their sibling with ASD and feelings of embarrassment as reasons for developing supports for TDSibs (Mascha & Boucher, 2006–51; Petalas, Hastings, Nash, Hall, Joannidi, & Dowe, 2012). Given the significance of self esteem and identity formation in youth development, the role of family identity in positive family system dynamics (Henry, Sheffield Morris, & Harrist, 2015) and the implications of self and family identity for individual adjustment and sibling relationship quality, a direction for research is to explicitly examine TDSibs' perspectives on differences and similarities between themselves and their ASDSibs. Important to understand are factors that give rise to perceptions of similarities and differences, links between these perceptions and youth adjustment and identity development, and contextual factors that moderate these linkages to promote a healthful balance between a sense of affiliation with their siblings and youth's appreciation of their unique characteristics. Findings that TDSibs may lack a complete understanding of their ASDSib's condition (Glasberg, 2000; Tanaka, Uchiyama, & Endo, 2011), and that youth's knowledge of ASD can be protective for their adjustment and sibling relationships (Milacic-Vidojevic et al., 2014) underscore the significance of such research and suggest directions for intervention. In the *SIBS* program (Feinberg et al., 2013), for example, activities encourage siblings to consider which of their characteristics are shared with their siblings and to identify the ways in which they are different.

Equity and Exchange Theories

These perspectives (Thibaut & Kelly, 1959; Walster, Walster & Berscheid, 1978) incorporate social comparison phenomena to explain individuals' satisfaction with their relationships as well as relationship continuity—an issue of potential significance in TDSib-ASDSib relationships given TDSibs' potential role as caregivers in adulthood. *Equity theory* holds that individuals track their contributions and rewards in their relationship relative to those of their partners. Relationship dissatisfaction, emotional distress, and efforts for relationship change, including withdrawing from a relationship, are a result of an imbalance between

partners' ratios of rewards versus contributions. From a *social exchange perspective* (Thibaut & Kelly, 1959), individuals track their relationship investments vs rewards, and when a relationship's costs outweigh its benefits, they withdraw. These theories were developed to explain voluntary relationships, and thus have been studied most often in adults. The more voluntary nature of sibling relationships in adulthood may mean that these theories can be applied to explain differences between sibling dyads that remain close versus those that are more distant. Consistent with these tenets, adult siblings of ADSibs reported more sibling contact when they felt more rewarded in their sibling role (Hodapp & Urbano, 2007).

Applied to childhood and adolescence, equity and exchange theories point to the importance of promoting TDSibs' positive experiences in the face of challenges they may experience due to the ASDSibs' behavior and needs for care. Although not explicitly grounded in these theoretical perspectives, intervention studies provide evidence consistent with social psychological tenets. Testing a strength-based program built around a 3-D technology designed for boys with ASD, for example, TD sisters reported a sense of pride in their brothers' skills, and mothers reported increased dyadic engagement by the siblings was attributed to siblings' shared interest in the technology program (Diener, et al., 2014). A program aimed at teaching behavior modification principles to TDSibs for use in social exchanges with their ASDSib also had the effect of increasing the TDSibs' positive and decreasing negative comments about their sibling (Schreibman et al., 1983). From these social psychological perspectives, increasing perceptions of "rewards" and decreasing "costs" to TDSibs may promote involvement with their siblings.

In addition to building behavior management skills that help youths promote positive and minimize negative behaviors by their siblings, parents can foster TDSibs' rewarding experiences, including by providing encouragement and praise for youths' activities and by engineering mutually enjoyable experiences for the dyad, including family activities. As we note below in discussing family systems concepts, such parental efforts to promote a sense of family identity and cohesiveness can have positive implications for the well-being of family members and the quality of family relationships (Henry et al., 2015; Patterson, 2002).

Theory of Planned Behavior (TPB)

A body of social psychological research has been directed at illuminating the links between individuals' cognitions—including attitudes and values, normative beliefs, perceived control, and behavioral intentions-- and their objective, observable behaviors (Ajzen & Fishbein, 2005). Although these ideas are not often applied to close relationships, they may be relevant for ASDSib-TDSibs, because the future of an ASDSib, and TDSibs' roles in that future are often of concern to youth and their families (Bågenholm & Gillberg, 1991; Ferrailoi & Harris, 2010; Petalas et al., 2012): Sibling relationships often extend across the life span, and both parents and youth may worry about the TDSib's role when parents are no longer able to provide support and care for the ASDSib.

At the most general level the TPB holds that behaviors can be predicted by individuals' *behavioral intentions*. These, in turn, are formed from individuals' *attitudes about the value* of a behavior, *normative beliefs* about the value of that behavior in the eyes of significant others, a sense of *control* about whether the targeted behavior can be accomplished, and

outcome beliefs about whether behaviors will have desired consequences. From this perspective, TDSibs' future involvement with their ASDSib can be predicted by their *intentions* to stay in close contact with their sibling, their *attitudes* about the importance of doing so, and their *normative beliefs* that significant others, like their parents, value such behavior. In addition, TDSibs must experience a *sense of control*, or efficacy about their ability to maintain their involvement, such as because they have resources such as time and money and because of contextual affordances and constraints such as proximity and effective modes of communication. Finally, they must believe that their behavior will have its intended *outcomes*, such as whether involvement will help their ASDSib to thrive and their companionship will be rewarding.

Because many of the causal factors targeted by the TPB are malleable, they can serve as foci for intervention, as evidenced by studies that have applied TPB principles in interventions to change health behaviors, including with children with developmental disabilities (Kwan, Cairney, Hay, & Faught, 2013). Importantly, no single factor is sufficient to predict a behavioral outcome. In addition, behavioral outcomes in the context of social relationships are arguably more complex than individual behaviors, including because the cognitions and behaviors of the relationship partner come into play. Because TDSibs often assume the role of leader in their relationships with their ASDsibs, however, the TPB theory may provide a useful heuristic for studying and promoting siblings' long term involvement.

The TPB also may be applied as a guide for parents who are struggling with concerns about the ASDSib's future. From this theoretical perspective, parents may be able to promote close ties between their children over the long term when they express their attitudes about the significance of each sibling's role in the other's life (i.e., promote *normative beliefs* about close sibling relationships). Parents can also help siblings develop the competencies they need—from knowledge about ASD to specific behavior management skills—that enhance TDSibs' sense of *control* over relationship experiences and eventuate in siblings' *outcome beliefs*—that their involvement will have its desired effects for their sibling and themselves. A body of work supports the tenets of Expectancy Value Theory, derived from the TPB, which holds that parents' beliefs about their children's competencies and their expectations for their children's successes are significant predictors of youth outcomes (Eccles & Wigfield, 2002). Applying these ideas with in of youth with ASD may advance theory and novel interventions.

In sum, a focus on cognition in sibling relationships incorporates a range of mechanisms, from the development of social understanding, to evaluations of the self, relative to others, as intrinsic to human motivation, to attitudes, values and beliefs that give rise to relationship behaviors. These are not competing perspectives; neither are their tenets inconsistent with theoretical perspectives that target sibling relationship behaviors and emotions. Instead, they may operate in mutually influential ways and are shaped by the contexts within which they occur, the topic to which we now turn.

Siblings' Involvement: The Ecology of Everyday Activities

Relationship behaviors, emotions and cognitions emerge in the context of siblings' daily activities together. Time diary studies reveal that typically developing siblings spend more of their non-school time with siblings than with any other companions (McHale et al., 2012). Bronfenbrenner (1979) described daily activities as the building blocks of the microsystem, and argued that youth's daily activities are both causes and consequences of their development. As causes, daily activities afford opportunities for building social bonds, learning skills, and developing an identity. As outcomes of development, time use reflects opportunities, demands, and constraints in the environment as well as individual interests, dispositions, and adjustment. According to Social Theory, because time is finite its expenditure is an "investment" --in developing social capital in the form of social ties, and human capital, for example, through development of knowledge and competencies (Coleman & Coleman, 1994). Finally, from a cultural ecological perspective, the meanings of activities emanate from the larger social ecology (Weisner, 2002): Factors such as parents' socialization goals and community norms underlie the socio-cultural scripts that imbue youths' daily activities with meaning, and the meanings attributed to daily activities have implications for their effects.

A body of research links youth's time use to their adjustment and development. For example, organized and goal oriented activities, activities that are supervised by adults, and shared family time are associated with positive development (Larson & Verma, 1999). A study of siblings showed that more time spent by the sibling dyad *in the company of parents* was linked to better sibling relationships (McHale et al. 2000). In contrast, unsupervised and unstructured activities such as hanging out with peers predict risky behavior in adolescence (Eccles & Barber, 1999). Of relevance to families of children with ASD are findings that the ecologically grounded meaning of youths' activities can moderate their effects. For example, for youth who rated the importance of family low, time spent on family work was associated with more depressive symptoms and lower school grades, but these links were nonsignificant for youth with high familism values (Lam, Greene, & McHale, 2012). Such findings imply that when youths' daily activities are incongruent with their values, they may have more negative implications for adjustment, and thus suggest directions for intervention.

We know almost nothing about TDSib-ASDsib shared time. Knott and colleagues (2007) observed sibling dyads in their homes on two occasions across 12 months. Findings revealed increases in the frequency of sibling interaction but that TDSib-ASDsib dyads were less engaged than dyads that included a sibling with Down syndrome. In this study, however, the timing of observation was chosen so that both siblings would be at home when mothers expected they would play together and the television was turned off. The field lacks information about how much time siblings *typically* spend together—including the nature of their activities (caregiving, play, family outings), who else is present during their activities, and siblings' evaluations of their activities, including the meanings they attribute to them.

One study of adolescents with ASD collected time diary data and found that most of youth's free time was spent with their mothers or alone in screen time (Orsmond & Kuo, 2011). Consistent with Social Theory and ecological tenets, however, time spent in conversations

was linked to cross-time declines in youth's social impairment. A cross sectional study on siblings in adolescence and mid-life revealed that sibling contact was less frequent in middle age. In this study, ASDSib-TDSib pairs had less contact than dyads that included a sibling with Down syndrome (Orsmond et al., 2009), but closer relationships were linked to more contact in both groups. In one of the few studies that linked caregiving activities for ASDSibs to TDSibs' emotional well-being, heavier responsibilities were associated with more emotional distress (Barak-Levy, Goldstein, & Weinstock, 2010). No information was provided, however, about the social context of youth's sibling responsibilities. For example, were youth's responsibilities consistent with the norms and values of their families? In addition to the social contexts of TDSib-ASDSib activities, the nature of siblings' shared activities—such as whether these activities are experienced as work versus play—may have implications for relationship evaluations and adjustment.

Also important is who else is present during sibling activities. Studying families with a child with ADS, Morgan (1988) noted that involvement in leisure activities *together with the family*—what he termed, the family's active recreational orientation— was associated with more adaptive family functioning. Sharing mutually enjoyable activities may foster feelings of connectedness between siblings and promote a shared family identity. Indeed, research and theory on family systems and resilience (Henry et al., 2015; Patterson, 2002) highlight the role of shared family activities in establishing a sense of family cohesion and identity. The *SIBS* intervention, for example, promoted siblings' involvement in mutually enjoyable activities and ones that they could undertake with their parents and families.

In sum, we know little about the everyday ecology of ASDSibs experiences including how much time they spend together and how and with whom they spend their time. Daily activities afford opportunities and set constraints on the nature of siblings' social exchanges: For example, sibling interactions may be more reciprocal when activities involve recreation, versus hierarchical as when activities involve caregiving, they may be more rewarding when they take place in the company of parents and others who can help to manage an ASDSibs' behaviors, and they may have more meaning when they are components of family routines and traditions. Directions for research on TDSib-ASDSibs' involvement are to document the nature and extent of siblings' shared activities, their links with individual adjustment and sibling relationship qualities over time, and the role of contextual characteristics in promoting positive involvement.

Directions for Future Research

Data on in ASD diagnoses suggest an increase of almost 300% in the number of U.S. children growing up with a sibling with ASD (Boyle et al., 2011). And, an expanding body of research describes the experiences of TDSibs and compares their adjustment and relationships to those with typically developing siblings or siblings with other types of disabilities. From this work, a picture emerges of substantial variability in the adjustment of TDSibs and in the nature and dynamics of the TD-ASD sibling relationships. Largely missing, however, are theoretically grounded studies that test: (a) mechanisms explaining within-group variability in the adjustment and relationship experiences of both TD and ASD

siblings, and (b) the individual and contextual factors that play a role in these processes and their implications.

The emotions, cognitions, behaviors, and activities that characterize sibling relationships occur simultaneously in the day-to-day interactions of TD and ASD siblings. Thus, understanding these relationships will require testing integrative hypotheses that take into account the range of processes underlying their multidimensionality—from social learning and comparisons to motivation and systems mechanisms. Another step is to explore variations in how these processes unfold as a function of siblings' characteristics, including dyad characteristics, such as gender constellation and sibling birth order, and youth characteristics, including those specific to families with a child with ASD. One important line of work focuses on characteristics of ASDsibs, including symptom severity and behavior problems (Hastings, 2007; Hodapp & Urbano, 2007; Mascha & Boucher, 2006). Further, recognition of TDSibs' elevated risk for Broad Autistic Profile characteristics directs attention to their role in TDSib-ASDsib relationships as well as TDSibs' adjustment (Benson & Karlof 2008; Petalas, et al., 2012; Shivers et al., 2013). Studies that incorporate information about individual characteristics of siblings in tests of process-oriented models can provide a model for novel interdisciplinary research (Hastings, 2003; Orsmond & Seltzer, 2009; Pollard et al., 2013).

Delineating the role of the multi-layered ecology in which sibling dynamics are embedded is another important direction. Although elements of the most proximal context—family—have been linked to TDSibs' and/or ASDsibs' individual adjustment, and in the face of theory, we still know relatively little about the effects of family processes on TD-ASD sibling relationships. Equally important are contexts beyond the family (e.g., local school and medical resources, state-level educational policies, sociocultural factors) that have implications for family and sibling dynamics (Saxena & Adamsons, 2013). Cultural values and practices are among the most significant but neglected such factors, although these may have significant implications ranging from effects on siblings' activities and family roles to the degree of their interdependence across the lifespan (Weisner, 2002). For instance, some cultural groups proscribe tight, lifespan bonds between siblings, and analyses of variability *within* ethnic groups in the U.S. have identified the roles of cultural values and practices in sibling dynamics (Updegraff et al., 2011). The increasingly diverse ethnic/racial U.S. population makes this a key research direction.

A major goal of all this work is the development of evidence-based practices and programs that support ASDsib-TDsib relationships and *both* siblings' adjustment. Although the many mechanisms described above merit investigation, we do not suggest that investigators wait until theory-guided descriptive research bears fruit before beginning to develop programs to promote sibling relationships and adjustment, especially in the face of the tremendous increase in rate of ASD diagnoses. Instead, we argue for the development of theory-informed practices and programs for youth and families based on existing evidence about the emotional, cognitive, and behavioral dynamics in ASDsib-TDsib relationships. When data are lacking, program developers can draw on knowledge about relationships of typically developing siblings or those of siblings with other kinds of disabilities. Such efforts should begin slowly, with development of practices and programs based on focus group and other

qualitative data from parents and siblings and with careful evaluation of piloting content to ensure the absence of iatrogenic effects.

This review suggests a range of directions for such sibling and sibling relationship focused programs. One is toward improving relationship behaviors—such as reducing conflict and aggression—as a means of enhancing sibling relationships as well as the adjustment of both TDSibs and ASDSibs. As sibling conflict is stressful for parents, this focus may also improve parents' well-being, with consequent improvement in parenting quality and even treatment adherence for the ASDSib. Enhancing sibling relationship behaviors may have corollary effects on TDSibs' cognitions and emotions, with implications for the long term course of their involvement. Given the many possible goals of sibling-focused interventions it will be important to delineate proximal and distal targets so as to maintain a clear intervention focus, and then to shape the content and delivery framework accordingly.

Importantly, strategies for fostering positive change in the sibling relationship will be dependent on the level of adaptive functioning of the ASDSib. For those at lower levels of functioning, reciprocal social exchanges and joint conflict-resolution strategies will not be the likely goals. Instead, as in the relationships of typically developing siblings who are at less mature or at very different developmental levels, activities that highlight siblings' complementary roles, with TDSibs as leaders, teachers, and caregivers, will be a focus. Identifying activity contexts that both siblings experience as familiar and enjoyable, including those with parents and supportive others, that elicit positive emotions and TDSibs' sense of efficacy in their sibling role will likely be a key program focus, regardless of siblings' developmental levels. Program activities also should be directed at collaborating with parents around providing TDSibs with an understanding –suited to their developmental level--of ASD and how it manifests in their sibling. Such information may help reduce stigma, increase the TDSib's understanding of how to engage with the ASDSib, and provide justification for parents' differential treatment.

There are also opportunities for providing skills and approaches for enhancing the ASDsib-TDSib relationship, with potentially important benefits for each. For example, findings that ASDSib-TDSib relationships may be both less warm and less conflictual suggest a level of disengagement. Thus, support for enhancing the engagement of ASD and TD siblings through daily activities, both recreational and caregiving, may be a direction for intervention. Further, given the benefits of parent involvement, supports for parents' efforts to scaffold ASDSib-TDSib engagement may be a focus. When siblings are disengaged, perhaps due to withdrawal of the TDSib or social discomfort of the ASDSib, efforts to enhance engagement may lead to an increase in sibling conflict and negative emotion. Consequently, interventions should provide support for both parents and youth in how to de-escalate and resolve sibling conflict as well as manage aversive behaviors. TDSibs will need clear guidance on their own versus their parents' role in managing challenging behaviors of their ASDSibs, roles that may change over time as youth mature. Families will need to consider the characteristics of both siblings and their goals for the sibling relationship, in making decisions about the TDSibs' current and future roles and then work consistently toward their development.

“There is nothing as practical as a good theory,” (Lewin, 1951). Theory is valuable because it can provide a research agenda aimed at delineating testable hypotheses about putative influence mechanisms and their effects. In addition, influence mechanisms derived from theory can be targeted in interventions to promote positive sibling relationships, sibling-related family dynamics and individual adjustment. In these ways, the theoretical perspectives we have reviewed may inform translational research on TDS-ASDSib relationships and their adjustment implications toward practical applications as well as scientific advances.

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