

Attending to the Exploration Side of Infant Attachment: Contributions From Self-Determination Theory

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Understanding the intergenerational transmission of attachment patterns has been a main focus of attachment research for many years. Most of the empirical work conducted on this question has addressed maternal sensitivity to infants' attachment needs. Given that security of attachment is defined as an attachment/exploration balance, some researchers have stressed the need to explore maternal behaviours in the context of infant exploration. The authors propose that self-determination theory (SDT) could contribute to attachment work in this respect given that it has clearly operationalized parental exploration-related behaviours and has related them to numerous child outcomes. This article highlights conceptual, empirical, and methodological parallels that can be drawn between SDT and attachment theory, thus suggesting that they could be complementary on many levels.

Keywords: Infancy, attachment security, exploratory behaviour, parental autonomy support

Over the years, the field of attachment has been invested particularly in identifying the mechanisms underlying the intergenerational transmission of attachment patterns from parent to child. Thus far, the largely accepted and extensively studied model assumes that maternal sensitivity mediates this intergenerational transmission. However, meta-analytic data suggest that maternal sensitivity accounts for only 23% of the association between parent and child attachment security, thus leaving a transmission gap (van IJzendoorn, 1995). Several authors have stressed the need to explore other maternal behaviours to bridge this gap. Given that infant security of attachment is reflected by the way in which infants organise their behaviours so as to maintain a balance between their needs for protection and comfort, and their need to explore the environment, K. Grossmann, Grossmann, Kindler, and Zimmermann (2008) stressed the need to attend to parental behaviours in exploratory contexts. We propose that a fruitful approach may be to draw from a field of research that directly addresses exploration-related parental behaviours, such as self-determination theory (SDT; Deci & Ryan, 2000, 2008). This paper aims to highlight the ways in which self-determination theory could complement attachment theory, and thus help to narrow the attachment transmission gap.

Infant Security of Attachment

Empirical research has shown convincingly that parent–infant attachment plays a key role in subsequent psychosocial and behavioural child outcomes (Thompson, 2008). For instance, compared to children who exhibit insecure attachment patterns, chil-

dren with secure attachment histories have been found to display more positive and harmonious parent–child interactions, increased capacity to develop close relationships with peers and adults, better emotion understanding and regulation, more positive self-regard, better social problem-solving skills, more advanced conscience development, as well as a variety of advantageous personality characteristics throughout childhood and adolescence (for a review, see Thompson, 2008). Furthermore, when present in conjunction with other risk factors, attachment insecurity has been documented as a risk factor for several forms of childhood psychopathology (Deklyen & Greenberg, 2008). Furthermore, longitudinal studies suggested that early attachment continues to be associated with personal adjustment in adolescence and early adulthood (see K. E. Grossmann, Grossmann, & Waters, 2005). Given the importance of infant attachment for future adjustment, attachment researchers have long been striving to acquire a fuller understanding of the ways in which attachment patterns are formed, and the processes through which they impact child development. The empirical evidence available at this time suggests that a mother's state of mind with respect to her own early attachment experiences is one of the strongest predictors of infant attachment (van IJzendoorn, 1995).

Adult Attachment State of Mind

Attachment state of mind refers to the way in which adults process thoughts and feelings regarding their own attachment experiences (Main, Kaplan, & Cassidy, 1985). It is assessed using the Adult Attachment Interview (AAI; George, Kaplan, & Main, 1996), a semistructured interview in which adults are probed about the nature of their relationship with their parents when they were growing up. They also are asked to recount specific childhood memories and to reflect on the ways in which the latter affected, and continue to affect, their lives. The interviews are transcribed verbatim and coded by means of a classification system, which assesses the thought processes and coherency apparent in the

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speaker's discourse (Main & Goldwyn, 1998). Individuals are classified as having an autonomous (F), dismissing (Ds), or preoccupied (E) attachment state of mind. In discussing trauma or loss, they may be classified as unresolved (U), in which case they are also given a secondary best-fitting classification of F, Ds, or E. Individuals with an *autonomous* state of mind value attachment relationships. They hold an even handed perspective of their relationships with their early attachment figures, their contributions to these relationships, and the role these experiences have played in shaping who they are today as adults. *Dismissing* individuals tend to downplay the importance of attachment relationships, insisting that they recall very little. They also tend to speak of their attachment figures in idealistic terms, although failing to substantiate their claims with concrete episodic memories. *Preoccupied* individuals tend to have difficulty stepping back and adopting an objective perspective regarding their relationship with their parents. Their discourse in the AAI may evidence mixtures of anger, fear, passivity, confusion, and vagueness. Finally, individuals are classified as *unresolved* when they exhibit lapses in thought or speech when discussing traumatic experiences such as loss or abuse (Main & Goldwyn, 1998).

Although attachment state of mind traditionally has been studied using the categorical approach described above, increasingly, attachment researchers underscore the insufficient use that is made of the richness of information gathered with the AAI, and thus advocate for the use of a dimensional rather than a categorical approach to individual differences in attachment state of mind (Hesse, 2008; Roisman, Fraley, & Belsky, 2007; Shaver, Belsky, & Brennan, 2000). Perhaps the most significant development in this regard is Roisman et al.'s elegant demonstration that the latent structure of individual differences in state of mind is consistent with a continuous distribution along two dimensions: a dismissing dimension and a preoccupied/unresolved dimension.

Intergenerational Transmission of Attachment

Maternal attachment state of mind has been found to predict infant security of attachment, even when the former is assessed prior to the child's birth (van IJzendoorn, 1995). Meta-analytic evidence suggests that mothers with autonomous states of mind tend to have infants who display secure attachment, dismissing mothers tend to have infants classified as avoidant, preoccupied mothers tend to have infants classified as ambivalent, and unresolved mothers tend to have infants classified as disorganized (van IJzendoorn, 1995). The magnitude of these associations is considered to be large for the social sciences ($d = 1.06$; van IJzendoorn, 1995). This intergenerational transmission also appears to be very robust: it has been observed in middle-class samples (e.g., Main et al., 1985); low socioeconomic status (SES) samples (e.g., Bus & van IJzendoorn, 1992); samples of adolescent mothers (Ward & Carlson, 1995); as well as in Western European, Japanese, and Middle Eastern cultures (e.g., K. E. Grossmann & Grossmann, 1991; Kazui, Endo, Tanaka, Sakagami & Suganuma, 2000; Sagi et al., 1997); and evidence suggests that it cannot be accounted for by genetic factors (Bokhorst et al., 2003; Dozier, Stovall, Albus & Bates, 2001; O'Connor & Croft, 2001).

The classic model proposed by attachment theory explains the intergenerational transmission through parental sensitivity to the child's signals, that is, a mother's ability to respond to her infant's

needs promptly and appropriately. Maternal sensitivity is often measured using the Maternal Behaviour Q-Sort (MBQS; Pederson & Moran, 1995), which is an observational measure designed to assess the quality of maternal behaviours within a home-based naturalistic setting. Although maternal sensitivity has long been the main focus of studies pertaining to the intergenerational transmission of attachment patterns, in recent years, empirical evidence has suggested that maternal sensitivity may not suffice in explaining the transmission of attachment. Meta-analytic data suggest that sensitivity accounts for only 23% of the direct association between parental attachment state of mind and infant security of attachment (van IJzendoorn, 1995). Subsequent studies have found very similar results, with maternal sensitivity explaining between 25% (Pederson, Gleason, Moran & Bento, 1998) and 36% (Raval et al., 2001) of the transmission. Hence, a large percentage of the common variance remains unexplained, thus leaving a transmission gap (van IJzendoorn, 1995). This challenging finding has been attributed by many to the quality of the measures of parental behaviours. It has been argued that the existing measures of sensitivity do not capture all relevant aspects of parent-child interactions likely to favour attachment security (van IJzendoorn, 1995). For instance, although the MBQS does not include items related to the use of language, many authors have stressed the importance of language when considering the quality of maternal behaviours, thus suggesting that maternal sensitivity includes a linguistic component (K. E. Grossmann, 1999; Meins, 1999). Other authors have stressed the need to adopt a broader multidimensional approach to the study of infant attachment, in which a variety of different maternal behaviours are considered (De Wolff & van IJzendoorn, 1997). There is considerable evidence suggesting that maternal attachment state of mind is linked not only to maternal sensitivity but also to individual differences in a variety of parenting behaviours (e.g., Adam, Gunnar, & Tanaka, 2004; Cohn, Cowan, & Pearson, 1992; Crowell & Feldman, 1988; Das Eiden, Teti, & Corns, 1995; Ward & Carlson, 1995). Furthermore, meta-analytic data have highlighted that several maternal behaviours, yielding effect sizes similar to maternal sensitivity, contribute to shaping infant attachment (De Wolff & van IJzendoorn, 1997). It therefore appears useful for future research aimed at narrowing the transmission gap to consider other maternal behaviours in addition to maternal sensitivity.

Maternal Behaviours in the Context of Infant Exploration

In addition to addressing a wider variety of maternal behaviours, K. Grossmann et al. (2008) proposed that we broaden the context within which we observe and study these behaviours. Specifically, they suggested that infant attachment be studied in the breadth with which the concept was originally defined by attachment theory.

Attachment theory posits that infants are equipped with distinct, yet inseparably linked attachment and exploratory behavioural systems (Bowlby, 1982). Ainsworth (1985) stated that infant security of attachment is reflected by the way in which infants organise their behaviours so as to maintain a balance between their needs for protection and comfort, and their need to explore the environment. In assessing infant attachment, it is therefore important to focus on this balance rather than focussing solely on the infant's comfort-seeking behaviours (Weinfield, Sroufe, Egeland,

& Carlson, 1999). While exploring their environments, infants described as having secure attachment relationships are able to seek out their caregivers for comfort and protection when they perceive a threat. On being comforted, these infants return promptly to their exploratory activities. However, insecure infants do not present the same balance between attachment and exploration. Infants classified as ambivalent tend to maintain attachment behaviours even in the absence of threat or stress, thus inhibiting their exploratory activities. Avoidant infants, on the other hand, appear to maintain exploration even when faced with a threatening or stressful situation. Given that security of attachment consists of a balance between emotional security and competent exploration, one may reasonably propose that maternal behaviours aimed at fostering confident exploration are just as important in shaping the development of infant security of attachment as maternal sensitivity to the child's emotional needs. It is generally postulated that maternal sensitivity also fosters competent exploration by providing the child with a sense of trust in the fact that the attachment figure will be available should a threat arise during exploration. Although this undoubtedly influences child exploration, it seems reasonable to propose that parental behaviours aimed specifically at enhancing the child's confidence and autonomy should contribute to the exploration side of attachment security as well.

Sroufe and Fleeson (1988) stressed the fact that attachment relationships included a wide range of interactive contexts. Along these lines, Thompson (1999) noted that infants' experiences with their caregivers provided answers to two questions, both equally central: "What do others do when I am upset?"; "What happens when I venture to explore?" (p. 282). K. Grossmann et al. (2008) suggested that we adopt a wider view of attachment by addressing what they referred to as *security of exploration*. K. Grossmann et al. (2002) noted that during exploration infants were faced with novel stimuli and challenges, which may elicit fear, wariness, or withdrawal. To foster secure exploration, the attachment figure must be sensitive to the infant's emotional needs and expressions, while at the same time providing appropriate support and challenge to the child with respects to his or her exploratory activities (K. Grossmann et al., 2002). Parental behaviours during child exploration will affect the child's sense of security during challenging tasks. In sum, Grossmann et al. (2002, 2008) suggested that parental behaviours should not only be assessed in contexts in which the child's attachment system is activated, but also in contexts in which the exploratory system is activated.

In keeping with Bowlby's (1982) eclectic tradition, we propose that a fruitful approach to addressing parental behaviours within the context of child exploration may be to draw from another field of research, one that extensively has studied child exploration, and presents precise operational definitions and measures of exploration-related parental behaviours. Given its empirical focus on the parental behaviours that support children's innate propensity to explore, SDT (Deci & Ryan, 2000, 2008) appears to be a promising conceptual framework to build on K. Grossmann et al.'s (2002, 2008) work on the importance of parental behaviours in the context of infant exploration, and thus further our understanding of the intergenerational transmission of attachment patterns.

The remainder of this paper aims at drawing several theoretical and methodological parallels between attachment theory and SDT, with the goal of highlighting the ways in which SDT may contribute to our current understanding of the intergenerational trans-

mission of attachment patterns. A brief review of SDT's basic postulates and empirical findings will be presented. A discussion will then follow highlighting how SDT may offer a useful theoretical framework from which to consider the exploration side of the attachment-exploration balance.

SDT

SDT views children as active agents. At the heart of the theory lies the assumption that humans are innately motivated, curious, and agentic. They naturally explore their environments, striving to acquire new skills, seek challenges, and extend themselves (Deci & Ryan, 2000, 2008). This ongoing process is referred to as *intrinsic motivation*, which is defined as the "innate propensity to explore and master one's internal and external worlds" (Ryan, Connell, & Grolnick, 1992, p. 170). Infant exploration, as defined by attachment theory, is therefore an expression of what SDT refers to as intrinsic motivation. Although infants are thought to be innately inclined to explore and seek challenge, SDT theorists caution that this natural tendency does not take place automatically, regardless of context (Deci & Ryan, 2002). Instead, SDT adopts a dialectical view where active organisms interact with social agents that may support or hinder their natural tendencies. The concept of basic psychological needs provides the basis from which social contexts are described as supportive versus undermining.

Psychological Needs

SDT posits that there are three basic psychological needs that must be fulfilled for healthy development to occur: the needs for autonomy, competence, and relatedness (Deci & Ryan, 2002). These needs are assumed to be universal, but the avenues through which they are satisfied may vary from one culture to another or from one developmental stage to another (Deci & Ryan, 2000). Optimal social and psychological outcomes are presumed to depend on the extent to which these three needs are fulfilled. Furthermore, it is assumed that, given the opportunity, all humans will naturally gravitate toward contexts that satisfy these three needs (Deci & Ryan, 2002). The need for *competence* is defined as the need to experience oneself as effective in interacting with one's environment. The need for *relatedness* is defined as caring for others, feeling connected, accepted, and cared for by others as well as experiencing a sense of belongingness with one's community. SDT theory draws a parallel between the need for relatedness and Bowlby's (1982) concept of security of attachment by suggesting that children's need for relatedness is fulfilled through a secure relationship with their caregivers (Grolnick, 2003). Finally, the need for *autonomy* is defined as the need to experience one's actions as emanating from one's own integrated values and interests, thus experiencing a sense of volition. It should be noted that autonomy cannot be equated with independence. SDT denotes a clear distinction between the promotion of volitional functioning and the promotion of independent functioning (Soenens et al., 2007). In fact, recent research findings suggest that the promotion of volitional functioning uniquely predicts adolescent psychosocial functioning whereas the promotion of independence does not (Soenens et al., 2007). Autonomy, as defined by SDT, thus refers to the degree to which one feels volitional and experiences his or

her behaviours as coherent with one's values and goals (Deci & Ryan, 2002). As such, a person may feel autonomous and still highly depend and rely on others. SDT states that all three needs must be fulfilled for intrinsic motivation and well-being to result. Deprivation of the three psychological needs may lead to various forms of psychopathology, ill-being, or unhealthy development (Deci & Ryan, 2000; Grolnick, 2003).

Supporting Children's Need for Autonomy: A Review

Although all three psychological needs are considered to be fundamental to healthy development and well-being, the need for autonomy has been the main focus of SDT research given that the other two needs have received considerable empirical attention in other fields of research. SDT proposes that individuals will be most intrinsically motivated when the environment supports their need for autonomy, rather than controlling their behaviour. Empirical evidence shows that various events that thwart a person's sense of autonomy such as threats, rewards, surveillance, deadlines, and evaluation are linked to decreases in intrinsic motivation (Deci & Ryan, 2000, 2008). On the other hand, autonomy-supportive events such as providing choice and acknowledging feelings repeatedly have been found to enhance intrinsic motivation (Deci & Ryan, 2000, 2008). Although the need for autonomy has been studied by SDT researchers within various life domains (Deci & Ryan, 2008), Joussemet, Landry, and Koestner (2008) proposed that it is especially relevant within the parenting domain.

Parental Autonomy Support

Akin to Baumrind's (1967, 1991) authoritative interpersonal style, SDT defines parental *autonomy-support* as "The degree to which parents value and use techniques which encourage independent problem solving, choice, and participation in decisions versus externally dictating outcomes, and motivating achievement through punitive disciplinary techniques, pressure, or controlling rewards" (Grolnick & Ryan, 1989, p. 144). As discussed previously, the need for autonomy is not synonymous with the need for independence. In certain fields of study, the term *autonomy support* (or encouragement of autonomy; e.g., Meins, Fernyhough, Fradley, & Tuckey, 2001) is used to describe parental behaviours aimed at encouraging children to do things by themselves without parental assistance. However, SDT uses the term *autonomy support* to refer to parental behaviours aimed at supporting a child's values, interests, and sense of volition. In contrast, parental *controlling behaviours* are defined as "pressures to think, feel, or behave in specified ways, thereby ignoring the person's needs and feelings" (Mageau & Vallerand, 2003, p. 886). This is similar to the concept of psychological control proposed by Becker (1964) and Schaefer (1965a, 1965b), which has been emphasised by Steinberg, Elmen, and Mounts (1989) as well as Barber (1996) in the past decades. When adults are working with infants or children on problem-solving tasks, examples of controlling behaviours may include giving directives, taking over, telling the answers, and unsolicited checking. In contrast, autonomy-supportive behaviours may take the form of informative feedback and positive encouragement, giving hints, suggesting strategies, solicited checking, and waiting for the child to require assistance before intervening (Grolnick, Gurland, DeCoursey, & Jacob, 2002).

A substantial array of empirical work has established links between the use of autonomy-supportive versus controlling approaches with children and a number of child outcomes throughout various stages of child development. Carefully controlled experimental studies have established a clear link between autonomy support and intrinsic motivation, and results have consistently highlighted the adverse effects of controlling behaviours on intrinsic motivation (for reviews, see Deci, Koestner, & Ryan, 1999; Grolnick, 2003; Mageau & Vallerand, 2003). For instance, Koestner, Ryan, Bernieri, and Holt (1984) asked 6- to 7-year-old children to engage in a painting task. The results showed that children who were given instructions in a controlling manner exhibited less intrinsic motivation than the children who were given guidelines in an autonomy-supportive manner, or the children who were given no guidelines at all. Specifically, when they were given the choice between painting and doing some other activity, they spent less time painting than the other children and they displayed less creativity in their paintings.

Building on these laboratory studies, in which the controlling adult was in most cases a confederate research assistant, a number of researchers attempted to study autonomy-supportive versus controlling behaviours in the context of parent-child interactions. Given that infant exploration is probably one of the purest displays of intrinsic motivation, Grolnick, Frodi, and Bridges (1984) explored the way in which mothers' autonomy-supportive versus controlling behaviours toward their 12-month-old infants affected the latter's motivation to explore their environment. They found that mothers who displayed overt autonomy-supportive behaviours had infants who were more persistent during play. Frodi, Bridges, and Grolnick (1985) followed up this sample of mother-infant dyads 8 months later when the infants were 20 months old. Maternal behaviour and infant mastery motivation (exploration) were reassessed at this time and were once again found to be interrelated. Specifically, maternal autonomy support toward their 20-month-old child was found to predict greater infant persistence and competence.

Evidence suggests that school-age children are also influenced by their mothers' autonomy-supportive versus controlling behaviours. Deci, Driver, Hotchkiss, Robbins, and McDougal Wilson (1993) asked mothers and their 6- to 7-year-old children to play together in a laboratory setting. Maternal vocalizations were recorded and coded. Children's intrinsic motivation was assessed by means of a self-report measure assessing the extent to which children reported liking the target activity, and an observational measure that assessed the amount of time the children spent doing the target activity during a period in which they could choose to do any activity they wished. The results showed that maternal controlling vocalizations were negatively related to both measures of children's intrinsic motivation.

In addition to the effects of parental autonomy support on children's intrinsic motivation, a great deal of research also has examined its effects on a variety of other important child outcomes. Using child-report measures, Avery and Ryan (1988) explored the link between the extent to which children perceived their relationship with their parents as presenting positive involvement and autonomy-support, and child self-perceptions and overall adjustment. Parental positive involvement and autonomy support were found to be positively related to children's perceived cognitive and social competence, their popularity with peers, as

well as their perceived self-worth and general adjustment. A lack of autonomy support also has been found to relate to child aggression. In a large longitudinal study aimed at tracing the developmental trajectories of physical aggression in school-age children, Joussemet, Vitaro, (2008) found that maternal controlling behaviours increased the odds of following the highest trajectory of physical aggression even when other risk factors such as child gender, child temperament, parental separation, and maternal age were taken into account.

Parental autonomy support versus control also has been linked to adolescent outcomes. For instance, in three studies conducted with late- and midadolescent samples, Soenens et al. (2007) found that the extent to which adolescents perceived their parents as promoting volition predicted their psychosocial functioning. In a study examining parental autonomy support versus control in adolescent samples from two distinct cultural settings (Russia and the United States), Chirkov and Ryan (2001) found perceived parental autonomy support to be positively related to well-being indicators such as self-esteem, self-actualization (which included measures of one's orientation toward self-acceptance, self-realisation, and intimate relationships), and life satisfaction in both cultures. Parental autonomy support was also found to be related to academic self-regulation in both populations. In another study with an adolescent sample, Williams, Cox, Hedberg, and Deci (2000) found that high school students who perceived their parents as autonomy-supportive also reported holding more intrinsic life values such as personal growth, fitness, affiliation, and community contribution, whereas students who perceived their parents as controlling reported more extrinsic aspirations such as fame, image, or financial success. Furthermore, students of controlling parents reported engaging in more risky behaviours such as the use of tobacco, marijuana, and alcohol as well as early sexual intercourse. Finally, several studies have found parental psychological control to be positively associated with a negative self-image (e.g., Teleki, Powell, & Claypool, 1984), antisocial behaviour (e.g., Barber, Stolx, Olsen, 2005), internalised and externalised adjustment problems (Conger, Conger, & Scaramella, 1997; Faber, Forehand, Thomas, & Wierson, 1990) and delinquency (Barber, 1996). Taken together, these findings are consistent with previous experimental results, which suggest that autonomy support may favour children's and adolescents' personal adjustment.

It should be noted that, with a few exceptions, most of the studies mentioned above assessed parental autonomy support via child reports. Given the interactive nature of parent-child relationships, obtaining parental reports of the nature of their behaviour toward their children would definitely add to the reliability of the results. However, obtaining parental reports of their own parenting behaviours is challenging because the measures must be carefully designed to avoid transparency, which could lead to biased responses. To address this problem, Grolnick and Ryan (1989) developed an interview-based assessment tool, in which parents were asked to describe how they motivated their children to do various activities, and how they responded to their children's behaviours. They interviewed parents of children in Grades 3 to 6 to explore the degree to which they tended to be autonomy-supportive versus controlling with their children. Parental autonomy support was found to be positively related to the extent to which children reported regulating their behaviour in an autonomous (rather than externally controlled) manner. Parental auton-

omy support was also found to be inversely related to teachers' reports of children's acting out and learning problems. Furthermore, parental autonomy support was found to predict grades and achievement on standardised tests. Using archival data collected by Sears, Maccoby, and Levin (1957), Joussemet, Koestner, Lokes, and Landry (2005) used this interview-based coding system to explore the impact of maternal autonomy support on children's social and academic adjustment. Maternal autonomy support and control were coded during an interview that mothers participated in when their child was 5 years old. Maternal autonomy support was found to be positively related to teacher ratings of social and academic adjustment at age 8 as well as to children's reading achievement scores at this age. The fact that this study used a longitudinal design and included multiple types of measures from multiple informants (parental interviews, teacher ratings, objective achievement scores) gives particular weight to the results obtained.

Few studies have addressed the ways in which parental control versus autonomy support affects the quality of the parent-child relationship itself, or other variables related to family functioning. Nevertheless, some studies have made some steps toward addressing this question. Assor, Roth, and Deci (2004) explored the link between college students' recollection of their parents' use of control and their own feelings toward them. Students were asked to report the extent to which their parents displayed conditional love and acceptance when they were children. The use of *conditional positive regard* is defined by SDT as a highly controlling behaviour. The results indicated that participants who perceived their parents as providing conditional positive regard during their childhood, also recalled experiencing high levels of parental disapproval, and feeling more resentment toward their parents during their childhood and adolescence.

Very few studies have directly explored the link between parental control versus autonomy support and attachment. In a sample of female university students, La Guardia, Ryan, Couchman, and Deci (2000) explored the link between need satisfaction and security of attachment, as measured by the Inventory of Adolescent Attachments (Greenberg, 1982; Greenberg, Siegel, & Leitch, 1983) and Bartholomew and Horowitz's (1991) Relationship Questionnaire. They found greater satisfaction of the three psychological needs to be linked to greater security of attachment as well as to more positive views of self and others. The need for autonomy and for competence continued to predict these variables even when the need for relatedness was partialled out. When considered independently, all three needs were also significantly associated with attachment security. It should be noted, however, that this study explored adult, rather than infant attachment. Furthermore, the self-report measures of attachment that were used in this study have been replaced by attachment self-reports based on more extensive psychometric work (e.g., Fraley, Waller, & Brennan, 2000). It also should be noted that in this study, as well as the one by Assor et al. (2004) discussed above, all of the variables were self-reported, which implies that the associations could have been inflated by shared method variance. Clearly, although there is tentative evidence that autonomy support may be related to attachment-based constructs, more research is needed to address the link between parental autonomy support and attachment with infants, preschool, and school-age children.

Finally, in the study discussed previously in which Frodi et al. (1985) explored the link between maternal autonomy support and

infant mastery motivation, infant attachment was also assessed at both 12 and 20 months old using the Strange Situation procedure (Ainsworth & Wittig, 1969). Maternal autonomy-supportive versus controlling behaviours were not found to be related to infant attachment at any age. However, the authors noted that the analyses were conducted with small cell sizes, which could have significantly limited their statistical power. Furthermore, they noted that their sample did not show the expected stability in attachment classifications between the 12-month and 20-month assessments. The authors cautioned that further analyses should be conducted including only the participants who evidenced stability in their attachment relationship with their mother, which was not possible in their study given the small cell sizes. The authors thus stressed the need for future research in this area.

Antecedents of Parental Autonomy-Support

Although empirical data clearly highlights the existence of marked individual differences in parenting behaviours, further research is needed to elucidate the factors that may explain why some parents tend to adopt more controlling (and less autonomy-supportive) behaviours than others toward their children. Previous research conducted by SDT theorists concerning the antecedents of parental autonomy support have found that parents who are perfectionist (Flett, Hewitt, Oliver, & MacDonald, 2002) or achievement oriented (Pomerantz & Eaton, 2001), who feel anxious when they are apart from their children (Soenens, Vansteenkiste, Duriez, & Goossens, 2006), who hinge their self-esteem on their child's behaviour (Grolnick, Price, Beiswenger, & Sauk, 2007), who have a strong fear of failure (Elliot & Thrash, 2004), and who lack trust in organismic development (Landry et al., 2008) tend to be less autonomy-supportive and more controlling than parents without these characteristics. Other antecedents that have been proposed include: economic hardship, stressful life events, and parents' orientation toward control or autonomy support (Grolnick et al., 2002). It also has been suggested that certain children may tend to elicit, through their behaviour, more control from their parents than others (Anderson, Lytton, & Romney, 1986).

Empirical evidence also suggests that interaction effects may occur between maternal personality and situational factors. In an experimental study with mothers and their school-age children, Grolnick and colleagues (2002) first determined each mother's individual tendency to control behaviour or support autonomy based on their child's reports. Mothers were then asked to assist their children in completing certain tasks. The extent to which mothers were pressured regarding their child's performance (i.e., the level of maternal ego involvement) was experimentally manipulated. The results indicated that mothers who came in to the lab with a controlling tendency, and who were put in the high-pressure condition, were more controlling than all other mothers. Mothers who came in with a tendency to support autonomy were not affected by the pressure manipulation. These results suggest that there are individual differences in mothers' orientations toward control versus autonomy-support, and based on their orientation, some mothers may be more vulnerable than others to external pressures placed on them and their children. These mothers are more likely to become ego involved in their children's performances, and thus more controlling. Given the importance of mothers' orientation toward autonomy support versus control with

respect to their vulnerability to situational pressures, these results lead us to wonder what factors explain these individual differences in maternal orientations.

SDT proposes that based on their early autonomy-supportive versus controlling experiences with their parents, children will develop generalised autonomy versus control orientations, which will then in turn guide their behaviours with their own children (Ryan & Grolnick, 1986). One may thus speculate that autonomy-supportive and controlling parenting styles could be intergenerationally transmitted. Assor et al. (2004) investigated the use of conditional positive regard (a behaviour that is defined by SDT as controlling) over three generations. Their results indicated that mothers who reported that their parents displayed conditional positive regard when they were young, were themselves perceived by their daughters as adopting the same approach. Although these results lend some support to the intergenerational hypothesis, more extensive research is required to fully address the question.

Conceptual Parallels

On review of SDT and attachment literature, several conceptual parallels between the two areas of study stand out. Both SDT and attachment theory are rooted in the assumption that human beings possess certain tendencies that are thought to be innate and universal, which motivate them to engage in specific associated behaviours. Furthermore, both theories note that the environmental responses to these innate propensities will eventually lead to the development of individual differences in children's behavioural and psychosocial functioning. Specifically, according to attachment theory children possess an innate attachment system, which leads them to engage in proximity-seeking behaviours aimed at obtaining comfort, reassurance, and protection from their caregivers, and an innate exploratory system which drives them to engage in exploratory activities aimed at mastering their environment. SDT posits that children are innately inclined to explore their internal and external worlds, master new skills, and extend themselves, which motivates them to engage in various exploratory activities. Furthermore, SDT states that individuals possess three basic psychological needs: the need for competence, relatedness, and autonomy, and that they are innately motivated to engage in behaviours aimed at satisfying these needs, or to gravitate toward environments in which these needs will be fulfilled. Hence, both attachment theory and SDT recognise that children have both attachment-related and exploration-related needs. Furthermore, both theories recognise that there are variations in the degree to which the environment within which a child evolves supports versus hinders these needs, which eventually lead to individual differences in various developmental outcomes. Hence, maternal sensitivity (attachment theory) and maternal autonomy support (SDT) are thought to be key maternal responses to children's innate needs and their associated behaviours. As reviewed above, both behaviours have been extensively shown to predict individual differences in diverse indicators of child functioning, such as security of attachment and intrinsic motivation. Hence, at the heart of both theories rests the notion that variations in parental responses to universal child needs are determinant in explaining individual differences in children's developmental pathways.

Given that SDT and the field of attachment present somewhat different conceptual foci, their work could be complementary in

many ways. Attachment theory could add to SDT's views on relatedness, namely by focussing on the unique nature of the child-caregiver relationship, and given SDT's focus on exploration, it could add to attachment work. Attachment theory is primarily interested in the balance between infants' attachment and exploratory behaviours. The theory presumes that when infants are in need of comfort or protection, their attachment system is activated whereas their exploratory system is somewhat dormant, making them unavailable to engage in exploratory activities. Infants who through past experience with their caretakers have come to trust that their parents will be available to attend to their attachment needs, are thought to be more available to explore. Thusly, attachment theorists are interested in the degree to which infants are available to explore their environments. In contrast, SDT notes that intrinsic motivation is more than just simple exploration of the environment, it refers to facing challenges, producing effects, and seeking feedback. Thusly, the theory emphasises the quality more so than the quantity of exploration. SDT assesses child exploration within exploratory contexts such as free play situations or problem-solving tasks, and focuses on the parental behaviours within these contexts that specifically support or hinder the quality of child exploration (e.g., providing choice, perspective taking, providing an optimal challenge, age-appropriate suggestions, solicited help, encouragement, etc.). SDT could thus inform attachment theory as to which behaviours foster infant exploration. In the past, attachment theory has focused on the parental behaviours that attend to infants' attachment needs, thereby providing them with a secure base from which to explore. However, infant security of attachment is defined as the way in which children organise their behaviours so as to maintain a balance between their attachment and exploration systems. One may therefore reasonably propose that studying the parental behaviours that have been shown to foster infant exploration (Frodi et al., 1985; Grolnick et al., 1984), such as SDT's concept of parental autonomy-support, could be a parsimonious and potentially useful addition to the search for the precursors of security of attachment.

Empirical Parallels

SDT provides a clear theoretical framework within which to assess and understand parent-child interactions in the context of exploration. However, SDT is a relatively new field; thus many empirical questions have not yet been extensively explored. For instance, although SDT research places considerable focus on the child outcomes related to different parenting styles, few studies have explored the effects of parental behaviours on the quality of the parent-child relationship itself. Second, further investigation is needed to explore the parental, child, or environmental antecedents of autonomy-supportive versus controlling parenting styles. Although a possible intergenerational transmission of parental orientations toward autonomy support has been hypothesised, this question has not been extensively investigated. It is also noteworthy that the field has not yet allotted a great deal of empirical attention to parental behaviours toward infants. Most of the research pertains to school-age children.

The field of attachment has conducted most of its work with infant populations. Furthermore, the field has long adopted an intergenerational perspective. Maternal sensitivity has been exten-

sively studied as a mediator of the intergenerational transmission of attachment patterns. However, attachment researchers recognise the fact that to fully understand the mechanisms underlying this process, the field must broaden its approach to include other maternal behaviours. De Wolff and van IJzendoorn (1997) conducted a meta-analytic study including a wide range of maternal behaviours shown to be related to infant attachment. They found that several maternal behaviours that were clearly conceptually distinct from maternal sensitivity yielded similar effect sizes. However, the maternal behaviours were not necessarily assessed within an exploratory context designed to activate the child's exploratory system.

As mentioned previously, certain researchers have stressed the need to attend to the exploration side of the attachment-exploration balance, and have assessed parental behaviours in the context of infant exploration (K. Grossmann et al., 2008). Although some attachment research has addressed parental exploration-related behaviours (Matas, Arend, & Sroufe, 1978), the field still presents few operational definitions or measures of these behaviours (K. E. Grossmann, Grossman, & Zimmerman, 1999). Furthermore, the field of attachment has not yet conducted studies in which parental behaviours are independently assessed both within contexts in which the infant's attachment system is activated and within contexts in which the exploration system is activated. To fully capture the mechanisms through which attachment patterns are formed, it appears reasonable to assume that we must consider both sides of the attachment-exploration balance, and assess parental behaviours related to both sides (see Figure 1). Furthermore, we might benefit from striving to create a fit between the type of parental behaviour assessed and the context within which it is measured.

SDT is particularly well suited to inform the exploration side of the attachment-exploration balance. It provides a framework within which parental behaviours related to child exploration are clearly defined and operationalized. Furthermore, SDT research already has linked these parental behaviours to a variety of im-

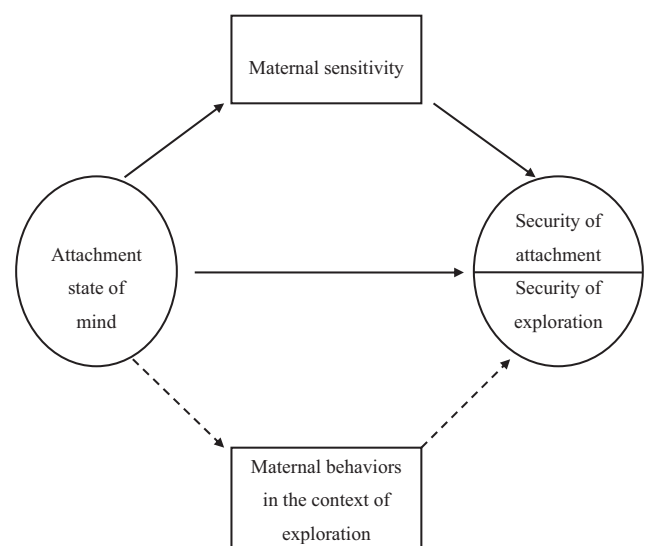


Figure 1. Schematic representation of the proposed role of parental autonomy support in narrowing the attachment transmission gap.

portant child outcomes, including the quality of infant exploration. Thusly, SDT presents a clear theory-driven framework to assess parental behaviours toward their children in exploratory contexts. However, as noted earlier, very little research has been conducted within the field of SDT to explore the extent to which parental autonomy support may relate to the quality of the parent–child relationship. Attachment theory presents a comprehensive classification system of variations in parent–child relationships, thereby providing a clear theory-driven framework within which to explore the link between parental autonomy support and the quality of the parent–child relationship.

Methodological Parallels

SDT and attachment theory go about the study of parent–child interactions employing very different, yet complementary methodologies. SDT theorists note that it is the functional significance, or meaning, attributed to specific controlling versus autonomy-supportive events in a given interpersonal context that affect children, not the event itself (Ryan & Grolnick, 1986; Ryan, Mims, & Koestner, 1983). Thusly, it is the child's perception of the environment as controlling or autonomy-supportive that is crucial. Although some SDT studies use observational measures, most tend to use paper-and-pencil measures, which have the advantage of tapping into children's perceptions of parental behaviours. However, these types of measures also introduce certain biases. If they were taken together with more objective observational assessments of parental behaviours, a more complete picture would likely emerge. Furthermore, paper-and-pencil measures are not well suited for studies conducted with infants or preschoolers who are not of age to fill out paper-and-pencil measures. When conducting studies with young children, observational measures could be particularly useful in that they assess not only parental behaviours, but also the context within which they take place, that is, the significance of these behaviours given the specific context.

In the field of attachment, interview and observational measures are the instruments of choice. However, the field has developed few measures of parental behaviours in the context of exploration. Although SDT measures have been developed mostly for school-age children, SDT has extensively operationalized these parental behaviours and thus has laid the groundwork for observational measures. In fact, Grolnick and colleagues (1984) developed an observational measure of parental autonomy support and control in the context of infant exploration, thus suggesting that these concepts can readily be assessed during infancy via observational measures.

SDT often conducts controlled experimental studies, thereby enabling researchers to consider causal links. The field of attachment rarely conducts such studies, thus limiting the extent to which causality can be addressed. On the other hand, given that SDT is a relatively new field, few studies present prospective or longitudinal designs, limiting the extent to which mediation and moderation models can be tested. Many attachment studies are longitudinal, permitting researchers to explore the changes in parent–child interactions through time, the intergenerational transmission of behavioural patterns, and the antecedents of various parental behaviours, in addition to allowing for the examination of theoretical models. Possible mediating and moderating variables are often considered. In sum, attachment

theory could benefit from SDT's use of experimental designs, whereas SDT could gain from attachment theory's longitudinal designs.

Conclusions

Given the numerous parallels that can be drawn between attachment theory and SDT, it appears clear that these two fields could complement one another in many ways, and thus benefit from collaborative work combining both theoretical perspectives. The field of attachment is renowned for its longitudinal designs as well as its use of rigorous observational measures of both child and parental behaviours. Traditional attachment studies explore the intergenerational transmission of attachment patterns as well as several factors proposed to mediate (e.g., Pederson et al., 1998) or moderate (e.g., Atkinson et al., 2005) the transmission. Although the field has dedicated a great deal of its empirical work to the study of maternal sensitivity, it has become apparent that to fully understand the intergenerational transmission of attachment, additional maternal behaviours must be considered. K. E. Grossmann et al. (1999) and K. Grossman (2008) pointed to the fact that maternal behaviours in the context of child exploration have been somewhat overlooked, and could potentially prove to be very informative. A promising area for future research would be to explore the links between maternal attachment state of mind, parental autonomy-supportive versus controlling behaviours, as defined by SDT, and infant security of attachment. This would add to the field of SDT by exploring the impact of parental autonomy support on the quality of the parent–child relationship, while also exploring the maternal antecedents of autonomy-support. The field of attachment would benefit from an elaborate theoretical framework in which the quality of exploration is clearly defined and operationalized, as are the parental behaviours that support or hinder it. Maternal autonomy support should be assessed in contexts where the infant's exploration system is activated, such as a challenging task unlikely to activate the attachment system. Taken together with the study of maternal sensitivity within contexts in which the attachment system is activated, this theory-driven approach to understanding the exploration side of infant security of attachment may prove to be useful in narrowing the transmission gap, thus contributing to solve one of the great challenges of contemporary attachment research.

Résumé

La question de la transmission intergénérationnelle des types d'attachement a été au centre de la recherche sur l'attachement pendant plusieurs années. La plupart des travaux empiriques menés en lien avec cette question ont porté sur la sensibilité maternelle aux besoins de l'enfant. Comme la sécurité de l'attachement est définie selon l'équilibre attachement/exploration, des chercheurs ont soulevé le besoin d'explorer les comportements de la mère dans le contexte de l'exploration de l'enfant. À cet effet, les auteurs suggèrent que la théorie de l'autodétermination (TAD) pourrait contribuer aux travaux sur l'attachement puisqu'elle propose des comportements liés à l'exploration clairement opérationnalisés qui sont associés à plusieurs manifestations chez l'enfant. Cet article fait ressortir les parallèles conceptuel, empirique et méthodologique qui peuvent être établis entre la TAD et la théorie

sur l'attachement, suggérant que celles-ci pourraient être complémentaires à plusieurs égards.

Mots-clés : Enfance, sécurité d'attachement, comportement exploratoire, soutien parental de l'autonomie

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