

Attachment in Deaf Mothers and Their Children

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In attachment research, there has been a growing interest in how adults conceptualize their relationships with their own parents as well as in the transmission of attachment status from parent to child and the variables that influence that transmission. The primary goal of the present study was to examine the transmission of attachment from deaf mother to child. Adult Attachment Interviews were collected on 32 deaf women and Strange Situation Procedure data were obtained from their children. While the distribution of deaf mother attachment classifications was similar to that found with hearing samples, the concordance between mother and child in terms of attachment status was lower than in hearing samples. Having a deaf parent did not affect a deaf adult's attachment status. Post hoc analyses suggested a trend towards a dismissing stance in attachment relationships. Results are discussed in terms of variables affecting attachment status as well as the transmission of attachment.

Attachment theory, developed by John Bowlby and Mary Ainsworth, has been a useful paradigm for studying relationships between parents and children and the adjustment of children (Bretherton, 1995). Marvin and Britner (1999) consider attachment to be the foundation for healthy individual development,

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with implications for the psychological well being of children and their parents.

The importance of stable early caregivers for the child's attachment has been reinforced by empirical observations (Ainsworth & Wittig, 1969; Ainsworth, Blehar, Waters, & Wall, 1978). The Strange Situation Procedure (SSP), developed by Ainsworth (Ainsworth & Wittig, 1969), enables researchers to observe children (typically between 12 and 18 months of age) in a standardized laboratory situation and classify their behavior. Securely attached children have strategies that allow them to express distress when they are stressed, to reestablish contact with attachment figures when available, and to modulate their arousal and return to normal play and exploration in the presence of the attachment figure. Insecure children may manifest different attachment styles. Those with avoidant attachment styles do not become distressed when the attachment figure departs and subsequently avoid contact when the attachment figure returns. Children classified as anxious/ambivalent tend to remain close to the attachment figure and demonstrate approach-avoidance behavior including anger and resistance after brief separation from the attachment figure. Main and Solomon (1990) subsequently identified a fourth attachment category, disorganized/disoriented, which includes those children who demonstrate confused and contradictory behaviors upon the return of their caretakers.

The distributions of children who are rated as secure, avoidant, and anxious are similar across studies.

Based on a meta-analysis of the attachment classifications of over 800 children, Lamb, Sternberg, and Prodromidis (1992) found that in most studies about 66% of children were classified as secure, 20% avoidant, and 14% ambivalent (also called resistant). The disorganized classification was not available in their analysis, but others have reported a 5% to 17% incidence of such classifications, depending on the nature of the sample (van IJzendoorn, Goldberg, Kroonenberg, & Frenkel, 1992). However, in the Bielefeld, Germany study, infants were classified as 33% secure, 49% avoidant, and 12% ambivalent (Grossmann, Spangler, Suess, & Unzner, 1985). The higher percentage of avoidant infants may reflect the fact that German mothers begin independence training quite early, even before their infants are 10 months of age. While the avoidant classification reflects insecure attachment, the German avoidant infants might be viewed as higher on the independence dimension.

Follow-up studies have suggested that securely attached children whose needs have been met in a socially responsive environment are more likely to explore their environment, to be more socially competent, and to do better in school compared to peers in a less responsive social environment (Ainsworth & Wittig, 1969; Lieberman, 1977; Sroufe, 1983). These patterns of attachment are relatively stable over extended periods of time (Main & Weston, 1981; Vaughn, Egeland, Sroufe, & Waters, 1979; Waters, 1978) so that attachment patterns are believed to influence individuals across the life cycle (Bretherton, 1995; Parkes, Stevenson-Hinde, & Marris, 1991; Rothbard & Shaver, 1994), although this is subject to further investigation.

Adult Attachment

In recent years, there has been a growing interest in adult attachment, considering that attachment plays a critical role in adult psychosocial adjustment (e.g., Feeney & Noller, 1996; Sperling & Berman, 1994; West & Sheldon-Keller, 1994). The extent to which the child's attachment style reflects that of the parent has also attracted increased attention (Karen, 1998), stimulated by the work of Mary Main and her colleagues (Hesse, 1999; Main, Kaplan, & Cassidy, 1985).

Main's reconceptualization of individual differences in the mental representation of the self as related to attachment led her to believe that internal cognitive representations of attachment "direct not only feelings and behavior but also attention, memory, and cognition [as well as] patterns of language and structures of mind" (Main et al., 1985, p. 67). In the process of developing the Adult Attachment Interview (AAI; Main et al., 1985; Main, 1996), Main focused on adult representational processes rather than behavior per se as mediators of parental caregiving behavior (Crowell, Fraley, & Shaver, 1999). AAI ratings of processes such as linguistic coherence and the expression of specific memories yield classifications of the respondent's representation of attachment as *autonomous*, *dismissing*, *preoccupied*, and *unresolved*; these ratings parallel the secure, avoidant, resistant, and disorganized classifications employed in the SSP (See Table 1). As with the distribution of the SSP attachment classifications, the adult classifications are not equal in proportions although they are similar across studies. In their meta-analysis of 33 studies analyzing more than 2,000 AAIs, van IJzendoorn and Bakermans-Kranenburg (1996) report a distribution of 58% autonomous (secure), 24% dismissing, 18% preoccupied, and 19% unresolved for nonclinical mothers, with the autonomous classifications predominating. These results are similar to the distributions reported in SSP classification studies (Ainsworth & Eichberg, 1991; Fonagy, Steele, & Steele, 1991; Lamb, Sternberg, & Prodromidis, 1992; van IJzendoorn, et al., 1992).

Concordance in AAI and SSP Classifications

The intergenerational agreement of attachment classifications between mothers and their infants has been demonstrated in several landmark studies reviewed by Hesse (1999). Most notably, when the concordance between the mother's classification and her child's was

Table 1 Parallel AAI and SSP classifications

AAI (Adult)	SSP (Child)
Autonomous	Secure
Dismissing	Avoidant
Preoccupied	Resistant
Unresolved	Disorganized

examined, van IJzendoorn's (1992, 1995) meta-analysis of close to 900 participants for whom SSP and AAI classifications were available found that mothers and their infants were rated similarly 75% to 80% of the time when the classifications were split into secure versus insecure categories. The concordances decreased somewhat to 65% across the categories when the four AAI and the four SSP categories were compared.

The presence of this concordance between the mental representations of attachment of mothers and the attachment status of their children raises the critical question of how such attachment status is transmitted from parent to child. Considering that children whose needs were met in a responsive and caring way developed a secure relationship with their mothers (Ainsworth, et al., 1978) and that maternal sensitivity to their infant is predictive of later secure attachments (Grossmann, et al., 1985), van IJzendoorn's (1995) meta-analysis of adult attachment studies found that approximately 12% of the variance ($r = .34$) in parental sensitivity and responsiveness can be explained by parental attachment security. He suggests that interactive mechanisms, including openness of communication, may be responsible for transmitting the parent's state of mind to the child. Fox (1995) suggests that attachment theory pays insufficient attention to individual differences in child temperament that may influence the transmission of attachment. Van IJzendoorn (1995) views attachment as sensitive to environmental influence with the role of temperament reduced by its lack of relationship with attachment in adulthood. In a review of contemporary research on parenting, Collins, Maccoby, Steinberg, Hetherington, and Bornstein (2000) conclude that the expression of inherited traits depends strongly on experience, including specific parental behaviors as well as predispositions and age of the child, thus arguing strongly for interactive effects.

Finally, whether attachment classifications are applicable across cultures has been the subject of additional research. The conclusions of most researchers have been strongly in favor of universal applicability (e.g., Cassidy & Shaver, 1999; Main, 1990; van IJzendoorn & Sagi, 1999). However, Rothbaum, Weisz, Pott, Miyake, and Morelli (2000) question the

universality of measures of sensitivity, competence, and secure base that are biased toward American values; they argue that these constructs are viewed differently in other parts of the world, giving examples from Germany, Japan, and Israel. How relevant these differences are in view of the perceived robustness of attachment theory remains open to question.

Deafness and Attachment

Childhood deafness has a significant impact on the family, altering communication patterns, parent-child relationships, and family dynamics (Calderon & Greenberg, 1993; Christiansen & Leigh, 2002; Marschark, 1993). Hearing parents may have difficulty in adapting to their deaf children's perceptual and learning needs and in mastering communicative skills and modes (Koester, Papousek, & Smith-Gray, 2000). Nonetheless, research reviewed by Lederberg and Prezbindowski (2000) suggests that in the areas of attachment, quality of maternal affective behavior, and maternal control, the impact of childhood deafness on the hearing mother-deaf child social relationship quality is not necessarily negative. This conclusion is substantiated by the absence of differences in secure attachment found for young deaf children with hearing parents and hearing children with hearing parents. Parents are often resilient, and adequate support networks can facilitate parental adjustment to the diagnosis and subsequent parent-child relationships (Meadow-Orlans & Steinberg, 1993). Hadadian (1995) noted no difference between deaf children's security of attachment scores toward either of their hearing parents as measured by the Attachment Q-Set. However, parental attitudes towards deafness were negatively correlated with their deaf children's security of attachment scores. In a study of hearing mothers of young children with hearing loss, Pipp-Siegel, Sedey, and Yoshinaga-Itano (2002) found that, given appropriate early intervention support, these mothers do not exhibit comparatively more stress than their peers with hearing children. The authors note that this has potential implications for attachment, considering the association between insecure attachment and high levels of parental stress.

For deaf parents, the presence of deaf children is not viewed as an atypical event in their lives. They have coping tactics and adaptive strategies in place, based on their lifetime social experiences (Koester, et al., 2000; Meadow-Orlans, 2002). Studies of preschool deaf children with deaf parents indicate similarities in attachment patterns and social behaviors when compared with hearing children of hearing parents (Meadow-Orlans, Greenberg, & Erting, 1990). The one published study that used the SSP with deaf toddlers of deaf parents showed the distribution of secure to insecure attachment to be the same as for studies with hearing children (Meadow, et al., 1985). However, it should be noted that this study used a “goal-corrected” coding scheme (Marvin, 1977) rather than the traditional classification system because the child participants were two to three years old.

When parents are deaf and their children hear, family functioning and child adjustment may depend on the parents’ sense of competence and their general mental health, rather than hearing-deaf issues per se (Harvey, 1989; Pollard & Rendon, 1999; Shultz Myers, Myers, & Marcus, 1999). Most research with hearing children of deaf parents focuses on speech and language development, and shows that early delays are soon remedied (Meadow-Orlans, 2002). The Gallaudet Infancy Study involved 80 mother-infant dyads that included hearing mothers with hearing and deaf infants as well as deaf mothers with deaf and hearing infants (some of whom participated in the project reported in this paper). The researchers conclude that mixed parent-infant hearing status may pose unique challenges for parents, although there was wide variability within each of the four groups of dyads (Meadow-Orlans, et al., in press).

Mental Representation of Attachment in Deaf Adults

The brief descriptions of the range of attachment experiences in deaf children of deaf and hearing mothers and hearing children of deaf mothers serve to illustrate the potential implications of research on the mental representation of attachment in deaf adults. These mental representations are related to their primary relationship experiences, both positive and

negative, throughout the life cycle and can influence psychosocial functioning and parent-child relationships. In terms of Main’s (1996) theory, negative experiences need not lead to insecure mental representations of attachment if the individual has resolved them. Chovaz McKinnon (1999) demonstrated this in a study of 50 deaf adults who communicated primarily in American Sign Language (ASL)¹ and whose hearing parents often did not sign. Many of these deaf adults received their early education in residential schools. Her AAI results for those adults suggested that deaf adult classifications were similar to a normative distribution of hearing adults. Additionally, in a study of attachment and interpersonal characteristics of college students with and without disability, in which 12 students with early-onset hearing loss represented approximately 18% of the early-onset disability group studied, no main effect of disability status was found (Huebner, Thomas, & Berven, 1999). In this study, the measure developed relied on written descriptions of early memories, which were subsequently coded based on attachment concepts derived from Main et al. (1985).

These studies imply that parent hearing status is not a significant factor in the attachment classification of deaf adults. However, this specific factor has not been researched in the deaf adult attachment literature.

Purpose of the Present Study

The purpose of this investigation was to examine the nature of attachment in deaf mothers and their children. We wanted formally to explore whether relationships existed between attachment classifications and the unique life experiences of deaf mothers, including parent hearing status and family communication. The research questions guiding this investigation were as follows:

1. Is there a high (>.70) concordance between the attachment classifications of deaf mothers, ascertained from the AAI, and the attachment classifications of their children, ascertained from the SSP?
2. Is there a relationship between concordant/discordant and secure/insecure attachment classifications and positive or negative life experiences that may be unique to deaf mothers, such as ease of early

communication with parents, parent hearing status, early separation from parents because of residential schooling, opportunities for positive peer group relationships in childhood/adolescence, and current participation in the deaf community?

Method

Participants

The primary requirement for the deaf mothers who participated in this study, in addition to being deaf and using ASL or Contact Sign² for communication, was that they have a child who would be 18 months of age (plus or minus two weeks) when they would be available for the SSP. The first set of potential participants included mothers who had participated in the Gallaudet Infancy Study (GIS). The GIS was a longitudinal study of deaf and hearing infants, aged 6 to 18 months, with hearing and deaf mothers. An extensive protocol included administration of the SSP when infants were 18 months old (Meadow-Orlans, Spencer, & Koester, in press). Deaf mothers who had participated in the GIS were mailed a letter with detailed explanations about the study, which was followed by a TTY call to inquire about their interest in participating. Nineteen of 40 deaf GIS mothers agreed to participate, and their children's original SSP classifications were made available.

To recruit additional mothers, announcements about the study were also sent to Deaf Digest, an electronic newsletter for the national deaf community. All mothers who were willing to participate were given appointments for the AAI. Those whose children had not yet participated in the SSP were given additional appointments for that procedure. An additional 13 mothers agreed to participate, resulting in a total of 32 deaf mothers for whom AAI classifications were obtained. Twenty-nine of these women were in relationships at the time of data collection, 26 with deaf partners, two with hearing partners, and one with a hard-of-hearing partner. One child could not have the SSP scheduled within the specified time frame and could not be included. Thus, AAI classifications were obtained for 32 deaf mothers, and SSP classifications were obtained for 31 children, all of whom were 18

Table 2 Characteristics of participating children and mothers

Children	
Gender	
Boys	45% (14)
Girls	55% (17)
Hearing Status	
Deaf	—% (11)
Hearing	—% (20)
Mothers*	
Average Age	35 years
Age at Onset Hearing Loss	6 years
Hearing Status of Mothers' Parents	
One or both deaf	47% (15)
Both hearing	53% (17)
Early Education	
Day or residential school deaf children only	78% (25)
With hearing children	22% (7)
Marital Status	
Married	91% (29)
Single, never married	9% (3)
Occupation	
Professional/managerial	25% (8)
Semi-professional	22% (7)
Clerical/technical	16% (5)
None (no response)	38% (12)
Race	
Caucasian	29
African American	1
Asian American	1
European**	1

*One child failed to participate in the Strange Situation within the specified age period, but the mother is included since the AAI had already been collected.

**Participant self-identified as "European."

months old at the time of data collection. Of the 31 children, 11 were deaf and 20 were hearing. See Table 2 for additional details about this sample.

Procedures

Data Collection

Strange Situation. The Strange Situation Procedure (SSP; Ainsworth & Wittig, 1969) was used to obtain attachment classifications for all children in this study. In this procedure, infants are videotaped in

a standardized laboratory situation consisting of the following 3-minute episodes:

1. The mother and infant enter an unfamiliar playroom;
2. The mother sits in a chair while the infant plays with available toys;
3. A stranger enters the room and converses with the mother;
4. The mother leaves the infant with the stranger;
5. The mother returns and the stranger exits;
6. The mother leaves the infant alone;
7. The stranger returns and comforts the infant if needed;
8. The mother returns and the stranger exits.

The entire procedure takes approximately 30 minutes.

Adult attachment. The Adult Attachment Interview (AAI; George, et al., 1985) consists of 20 primary questions, most with subsets, that take approximately an hour to administer. Subjects are asked to describe their relationships with both parents, to tell of specific incidents illustrating examples of stress and how parents handled those situations, feelings of rejection during childhood, parental threats, and discipline. They are asked about relationships with members of their extended family and about any prolonged separations from or losses of important caregivers. Also queried are current relationships with parents and how these early experiences may influence their own parenting practices. The emphasis is on the mother's mental representation of the attachment experiences described and how these are reflected in aspects of linguistic discourse.

Background questionnaire. A brief, easily readable background questionnaire was also used to obtain basic information on family composition and communication, onset and degree of deafness, educational history, and level of participation in the deaf community. Level of participation in the deaf community was seen as important because the parenting skills of deaf parents are often buttressed by the existence of a cohesive deaf community that can provide support (Lane, Hoffmeister, & Bahan, 1996).

The AAI and the SSP procedures were conducted in a laboratory area that had two video cameras and a video mixer set up to videotape each session. Deaf and hearing AAI interviewers with equivalent advanced signing proficiency were trained in the interview procedures before conducting interviews with the mothers. The training involved memorizing the basic nature of the queries in order to maintain a natural conversational style and referring to a very condensed prompt sheet when needed (George, et al., 1996). Thus, exact translation into ASL was not required. Rather, paraphrasing was used to capture the essence of the queries. Individuals assisting with the SSP were trained to instruct the mothers through the process or serve in the function of the stranger. Initially, mothers were provided with a written description of the study before signing informed consent forms. The interviewers additionally explained that the study entailed a personal history interview that would result in data that would help parent education programs and mental health programs provide better services to deaf persons and their families. Procedures for ensuring subject confidentiality were instituted after review of the protocol by the Institutional Review Board. The mothers were paid \$25.00 for participating in the study.

Coding

For the SSP, trained observers reviewed the videotapes and made qualitative judgments concerning the infant's reactions to the mother during the two reunion episodes that result in the following attachment classifications: B—secure, A—avoidant, C—ambivalent/resistant, and D—disorganized (Ainsworth & Wittig, 1969; Main & Solomon, 1990).

The AAI interviews are transcribed according to detailed instructions and rated to yield classifications of the mother's attachment as F—autonomous, D—dismissing, E—preoccupied, or U—unresolved. Within each classification, there are subtypes. For example, within the F or autonomous category, there are five subtypes, labeled F1 through F5. An F3 classification fits the most pure definition of autonomous, while an F5 is mostly autonomous, but with some anger or preoccupation. Similarly, an F1 is mostly autonomous, but with some features of a dismissing individual.

Certified sign language interpreters translated the AAI videotapes from ASL or Contact Sign to written English, approximating as closely as possible the linguistic quality of the mother's expressions. The translations were verified by one of the researchers³ or the interviewers themselves before being submitted for blind coding by the researcher who had undergone extensive training and was certified to code the AAI (Brice). Two certified SSP coders coded the SSP videotapes.

Because the AAI coder was newly certified, another certified coder was recruited to independently score 10 of the 32 AAI protocols. There was perfect agreement on seven out of the 10 protocols, with very close consensus on an eighth. There was disagreement in the scoring of two protocols, which were extensively reviewed before a final classification was determined. The SSP tapes were not independently classified since the two coders were both certified and very experienced in the coding procedure. The SSP is also a highly structured and standardized procedure with a long history of use in research, and reliability of trained coders has been established.

Results

The SSP results indicate that the distribution of A—avoidant, B—secure, C—ambivalent/resistant and D—disorganized classifications is similar to that found in other studies, with the exception of the lower number of anxious-resistant children. Specifically, 61% of the children were classified as B—secure, 32% as A—avoidant, and only 3% of the sample (one child) was classified as C—ambivalent/resistant (one child was coded as “cannot classify”). The percentages were similar for both deaf and hearing children (70% deaf and 60% hearing children were coded secure, 30% and 35% respectively were coded avoidant; 5% of hearing children were coded anxious/resistant.). A chi square comparing the present sample with the expected distribution based on past research approached significance, with the present sample containing a larger proportion of avoidant children, $\chi^2(2, N = 30) = 4.97, p = .083$. Table 3 presents comparisons of observed with expected distributions.

Table 3 Child attachment status by hearing status

Attachment*	Child hearing status		Normative/expected**
	Deaf	Hearing	
B—secure	70% (7)	60% (12)	66%
A—avoidant	30% (3)	35% (7)	20%
C—anxious	0	5% (1)	14%

*One child could not be classified and was rated “CC.”

**Data extrapolated from the meta-analysis conducted by Lamb, Sternberg, and Prodromidis (1992) based on over 800 children.

The distribution of attachment status for the deaf mothers was dominated by F—autonomous classifications. Seventy-two percent of the sample (23 participants) was coded as F—autonomous, 22% (7) as D—dismissing, and 6% (3) as E—preoccupied. These data were similar to the SSP classifications, with a very small number of participants classified as E—preoccupied or anxious resistant (the child counterpart). A chi square computed to compare the present sample of deaf mothers with past data from hearing samples was not significant, $\chi^2(2, N = 32) = 3.6, p = .163$. Table 4 shows AAI data compared with expected frequencies. In order to determine whether education had an influence on attachment status, the distribution of attachment classifications from the AAI were compared for those women in professional or semi-professional occupations and those in occupations not requiring higher education. The chi square was not significant, $\chi^2(1, N = 32) = 1.39, p = .238$.

Research Questions

The first research question addressed in the current study relates to the concordance between attachment status for mothers and their children. Past studies (van IJzendoorn, 1992, 1995) have found 75 to 80% concordance between two-way (secure-insecure) classifications of mothers and their children. In the present

Table 4 Distributions of adult attachment status

Attachment	Deaf mothers	Normative/expected*
F—autonomous	72% (23)	56%
D—dismissing	22% (7)	27%
E—preoccupied	6% (2)	17%

*Data extrapolated from the meta-analysis conducted by van IJzendoorn (1995) based on 661 parent-child dyads.

Table 5 Mother-child breakdown for attachment status using a three-way classification

Adult attachment	Child attachment status*		
	A/Avoidant	B/Secure	C/Anxious-resistant
D—dismissing	10% (3)	10% (3)	3% (1)
F—autonomous	27% (8)	43% (13)	0
E—preoccupied	0	6% (2)	0

*One child who was rated “cannot classify” was not included in this table.

Table 6 Mother-child concordance for secure/insecure attachment

Adult attachment	Child attachment status*	
	Secure	Insecure
Secure	48% (15)	26% (8)
Insecure	13% (4)	13% (4)

*One child rated as “cannot classify” was included in the insecure group.

data, 61% of the mothers and children matched for secure-insecure status, with the remaining 39% divided between secure mothers with insecure children and insecure mothers with secure children. Table 5 shows the concordance based on the three-way classification, while Table 6 presents the concordance for a two-way classification. In looking at the discordant mother-child dyads, 26% of the sample involved an F—autonomous mother with an avoidant child. In only 5 cases (16%) were there insecure mothers with secure children. It is interesting to note, however, that the two E—preoccupied mothers had secure children.

Thus, while some level of concordance between the attachment status of deaf mothers and their children was obtained, these levels do not reach those of hearing samples. The concordance was practically identical for deaf mothers-deaf children (64% matched) and for deaf mothers-hearing children (62% matched). Chi square analyses were conducted based on the 75 to 80% concordance between secure-insecure classifications of mothers and their children as found in previous studies (van IJzendoorn, 1992, 1995). A chi square analysis using 75% matched as the expected frequency value for the concordant group yielded marginally significant differences in the present sample, $\chi^2(1, N = 31) = 5.17$, $p = .08$. When using an expected concordance rate of 80%, the difference between the present sample and past samples of hearing dyads is significant, $\chi^2(1, N = 31) = 10.107$, $p = .006$.

The second research question focused on variables that might influence the security of attachment in deaf women, such as having deaf parents themselves, ease of communication with parents, and other deaf identity characteristics. In order to address this question, data from the family background questionnaire were analyzed in conjunction with the AAI protocols. The first variable to be examined was the hearing status of the deaf participant’s parents, specifically the grandparents of the participating infants (all but two of the participants had parents of similar hearing status, with 15 having deaf parents and 17 having hearing parents—two participants had deaf mothers and hearing fathers). Two separate analyses were carried out to examine the influence of grandparents’ hearing status. First, the distribution of attachment classifications was compared for deaf women with deaf parents and deaf women with hearing parents. Second, each distribution was compared with the expected distribution of attachment classifications based on past research. Table 7 shows the numbers and percentages of deaf women in each of the attachment categories by parental hearing status.

The deaf women with hearing mothers were most likely to be F—autonomous, with 12% being D—dismissing and 6% E—preoccupied. The deaf women with deaf mothers were less likely to be secure than those with hearing mothers, and more likely than their peers with hearing mothers to be D—dismissing in their approach to attachment issues. The chi square

Table 7 Adult attachment status by grandparent’s hearing status

Adult attachment	Grandparent’s hearing status	
	Deaf	Hearing
F—autonomous	56% (9)	82% (14)
D—dismissing	31% (5)	12% (2)
E—preoccupied	6% (1)	6% (1)

testing the difference in distributions of the two groups, though, was not significant. When comparing the present samples with data from past research, it appears that the pattern obtained for deaf women with deaf mothers matches closely the secure/insecure proportions found in the literature on hearing adults. However, a chi square computed on the data for deaf women with hearing mothers, using an expected frequency of 60% secure (the frequency found in the literature on hearing samples) showed that our sample was significantly different from hearing samples, $\chi^2(1, N = 17) = 3.89, p = .049$. The same pattern was obtained for fathers, although the difference was not statistically significant, $\chi^2(1, N = 19) = 1.94, p = .163$. Furthermore, Table 8 shows the relationship between grandparent hearing status and the child's attachment status based on the SSP classification. The differences between the groups are not significant as based on chi squares.

In an attempt to further investigate a deaf culture component to attachment status,⁴ the various pieces of background data that were collected—such as whether participants had deaf parents, attended a residential school for the deaf, described communication as easy and smooth, and other characteristics of deaf families—were analyzed in terms of attachment classification. The only variable that significantly distinguished between secure and insecure attachment status in deaf women was whether they self-identified as members of the deaf community, Wilk's Lambda (distributed as chi square) = .809, $p = .012$. An overwhelming majority of women (29 out of the 32 in our sample) identified themselves as members of the deaf community. In looking at the distribution of AAI classifications, only 1 woman out of the 24 F—autonomous classifications reported not being sure if she considered herself a member. The remaining 23 did. Of the remaining 9 women who were classified as insecure, 3 said they were not members of the deaf community, while 6 said that they were. Thus, this finding can only be viewed as tentative.

An additional post hoc analysis was conducted to further investigate the relationship between adult attachment status in deaf women and the hearing status of their parents. Seven out of the 24 women coded F—autonomous had been coded F5. A code of

Table 8 Child attachment status by grandparent's hearing status

Attachment status	Grandparent's hearing status	
	Deaf	Hearing
B—secure	62% (8)	65% (11)
A—avoidant	38% (5)	29% (5)
C—anxious/resistant	0	6% (1)

F5 suggests that while the respondent was coherent and contained, there was a quality of anger or displeasure present that had some preoccupying quality to it. A recoding of the data was done, moving participants with a code of F5 into the E—preoccupied category. This resulted in a total of 8 participants being classified as E—preoccupied. Seven of these 8 participants, or 88%, had hearing parents. In contrast, seven women had been classified as D—dismissing. Five out of those 7, 71%, had deaf mothers. When women who had a coding of F1, a code that suggests an autonomous attachment representation with some setting aside of attachment thoughts or concerns, were included in the dismissing group, the percentage of deaf parents dropped to 58%. The hearing status of the deaf mothers' parents does appear to have some impact on the secure versus insecure analysis. However, the present data regarding qualitative differences in the mental representations of attachment for deaf women with deaf versus hearing parents can only be viewed as suggestive pending further investigation.

Attending a residential school for the deaf was a very common experience for deaf children a generation ago, when the deaf women from our sample were growing up. When looking at the breakdown of women who attended residential schools and the age at which they entered, it was observed that for women with D—dismissing qualities (i.e., F1 classifications), 83% went to a residential school before the age of 13. Sixty-nine percent of F—autonomous women started at a residential school before 13. In contrast, only 25% of women classified as E—preoccupied attended a residential school before the age of 13.

Discussion

Our understanding of the mechanisms of transmission of attachment status is still evolving. The parental

variable most frequently studied, parental sensitivity to their children, has only explained approximately 12% of the variance in child attachment (van IJzendoorn, 1995). Other variables also play significant roles. A major purpose of the present investigation was to study the transmission of attachment from mother to child using a sample that is unique in terms of linguistic and cultural characteristics. Our data suggest that, unlike hearing samples for which 75 to 80% of the parents and children were matched on secure-insecure attachment classifications, concordance is lower when the mother is deaf. Furthermore, this finding held regardless of mother-child concordance for child hearing status: deaf mothers and deaf children were no more likely to be concordant for attachment status than deaf mothers and hearing children. Interestingly, both of the deaf mother children samples had a large proportion of F—autonomous/secure classifications (70% and 65% respectively). Yet, the mother-child pairs did not match up in terms of these classifications as much as hearing parents with hearing children do.

One possible interpretation of the data from the present project may be that the parent's culture influences the transmission of attachment. The insecure deaf mothers who grew up with deaf parents were more likely to be D—dismissing while deaf women who grew up with hearing parents were more likely to be E—preoccupied. In addition, the mismatches between mothers and children were predominantly F—autonomous or secure mothers with children that were categorized as avoidant. When this is viewed in light of the large number of women in the sample who attended residential schools where independence from family and self-reliance are valued and perhaps necessary, it may be that these women are basically passing along a particular way of being to their children that involves a certain level of independence, seen in the SSP as avoidant. This interpretation is suggested by, for example, the Bielefeld study (Grossmann, et al., 1985), which resulted in a proportionately higher number of avoidant infant classifications, possibly because German mothers tend to start independence training early in their infant's life.

An additional interpretation of the data may have to do with styles of visual processing. If deaf children are unable to attend visually to both the mother and

the environment at the same time, and are maximizing visual exploration of the environment, they might have appeared more avoidant than may have been the case. Also, the larger-than-expected proportion of both deaf and hearing infants classified as avoidant could have been due to the fact that at 18 months children who have just begun to walk and run may not consistently attend visually to their mothers. It may even be that the SSP is most appropriate for hearing mothers and hearing children and could be applied to deaf children with minor modifications.

An additional purpose of the present study was to investigate the influence of those life experiences that are unique to deaf adults, such as ease of early communication with parents and early separation from parents for residential schooling. Since our data suggest that the distribution of attachment classifications in deaf women is similar to that in hearing samples, this provides further support for the findings reported by Chovaz McKinnon (1998) on the similarities between her deaf adult sample attachment classifications and those of a hearing adult normative sample. This finding also further attests to the resiliency and universality of attachment in the face of what could be potential communication difficulties subsequent to the diagnosis of deafness when the parents are hearing.

Having a deaf parent did not increase the chances of an F—autonomous classification, nor did having a hearing parent decrease those chances. The distribution of attachment status in deaf women with deaf parents matched that of hearing samples. The distribution of attachment status in deaf women with hearing parents actually had significantly more secure women than the hearing samples. This finding does seem to reflect the data from previous studies with deaf children of hearing mothers in that the distribution of secure and insecure children was the same or similar to hearing mothers with hearing children. It may be that even though communication was problematic with hearing parents, the women in the present sample had resolved issues related to communication, leading to autonomous mental representations of attachment. The post hoc analyses suggested that most women who had some preoccupied quality to their narrative had hearing parents, even though their narratives did

not suggest an insecure attachment representation. As findings from the Gallaudet Infancy Study suggest, secure attachment can and does develop despite delayed language development and reduced parent-child communication (Meadow-Orlans, Spencer, & Koester, in press). It is also possible that the educational level of the parents may have influenced these results. Fifteen of the 20 women who noted their occupation said that they have jobs requiring a college education, and the sample was recruited through a community that tends to be college educated. While the analysis of differences between those with jobs requiring college education and those without was not significant, the educational level of our participants was not entirely clear.

The only variable from our demographic questionnaire that was significantly related to attachment status was self-identification as a member of the deaf community. The AAI authors construed adult attachment to reflect a cognitive construct, specifically a mental representation that one holds regarding other people and the nature of relationships with those people. Being a member of a community involves identification with that group. This is also a mental representation. To the extent that the participants in our sample identified with the deaf community, the more likely they were to also be coherent in their discourse as they described their relationship and experiences with their own parents. However, whether this identification with the deaf community is a necessary factor in their coherency requires further study with a larger group of deaf mothers who do not identify with the deaf community.

Anecdotally, deaf adults frequently tell stories of feeling left out of their hearing family, or of not feeling connected to the hearing family. Our data revealed a large number of deaf adults who expressed some level of anger or resentment towards their parents. However, this anger was contained and had been resolved at least to the point that it did not interfere with their discourse. One might hypothesize that having found a culture and community with which they could identify allowed some resolution to take place, suggesting a connection between the mental representation towards attachment relationships and towards one's self.

Limitations of our sample necessarily temper interpretation of these data. First, as is often the case when studying unique or special populations, our overall sample size was not large, precluding a more fine-grained analysis, as well as making it more difficult to obtain statistically significant findings. The deaf women who participated in this project may not be representative of deaf women around the country. Our participants were mostly college educated, and many resided in the greater metropolitan Washington, DC area. These women may have had more of an opportunity to involve themselves in a community that supported and encouraged them, perhaps allowing them to resolve feelings toward their families of origin that might otherwise not have been resolved. Their education and community involvement may also have influenced their child-rearing approach in ways different from those of deaf mothers from other geographic or social spheres. Still, the findings are provocative in that they suggest the need to search for additional mechanisms and/or variables related to how parents influence the development of the attachment system and later attachment representations in their children.

Notes

1. ASL is a formal language with its own grammatical structure.
2. Contact Sign is a method of signing that uses signs from ASL, but it is reorganized to match English grammar. In the past it was referred to as "Pidgin Signed English," but now more often as Contact Sign.
3. This was done by Leigh, who is deaf and a long-time member of the deaf community, fluent in ASL, and has extensive experience in these types of translations.
4. Deaf culture is the view of life expressed through the use of American Sign Language (ASL), as well as the mores, beliefs, expressions, and understandings particular to members of the deaf community.

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