This study examined the importance of reported sense of coherence (Antonovsky, 1987) in mothers of children with hearing impairment. Sense of coherence was explored as a factor in relation to the experience of stress and subjective life satisfaction and in the context of other relevant variables in coping (e.g., social support, additional handicaps of the child, child’s hearing status, means of communication). Two hundred thirty-five mothers completed a questionnaire, and path analysis corroborated a theoretical model in which sense of coherence was delineated as a factor contributing directly to stress perception. Both sense of coherence and the experience of social support were identified as resources that reduced reported stress and improved quality of life, with sense of coherence especially important in reducing stress. Child variables, including additional handicaps and extent of hearing impairment, intensified reported stress for the mothers, but mode of communication with the deaf child did not affect stress experience. The findings are discussed within the context of socialization theory. Recommendations for further research (e.g., longitudinal data, control designs, socio-economic status, applicability to fathers) are made.

In recent years the concept of sense of coherence (SOC) (Antonovsky, 1987) has received increased attention in social and medical science. Its rising importance is closely connected to changing conceptions of health. This has moved from a pathogenic view to one that includes a broader notion of relative well-being, or salutogenesis. The change can be described as follows:

Thinking pathogenically means examining the origin and the treatment of disease. Salutogenesis does not refer to the opposite in the sense that it is devoted to the origin and maintenance of health as an absolute state. Rather, it refers to the fact that people are to be considered more or less healthy while at the same time being more or less ill. Thus the question here is: How does a person become healthier and less ill? (Bengel et al., 1998, S. 24; tr. Debbie Johnson).

Research should therefore try to establish the factors that contribute to the optimization of health while keeping in mind that optimal health is not always achieved during life. Within this salutogenic perspective, the concept of sense of coherence has a central role, since it is a psychological factor that varies among individuals and is implicated in establishing a health-driven rather than a pathology-driven outlook. According to Antonovsky, SOC especially influences the ability to deal with stressful life experiences (Antonovsky, 1987; Antonovsky & Sourani, 1988). This makes Antonovsky’s approach especially useful in considering the outlook and strategies of deaf and hard-of-hearing children and their families.

According to Antonovsky, sense of coherence means “a global orientation that expresses the extent to which one has a pervasive, enduring though dynamic feeling of confidence that (1) the stimuli, deriving from ones internal and external environments in the course of living are structured, predictable and explicable; (2) the resources are available to one to meet the demands posed by these stimuli; and (3) these demands are
challenges, worthy of investment and engagement” (Antonovsky, 1987, p. 19). Sense of coherence thus is both a basic feeling and a certain view of the world that assumes that we have sufficient understanding of the things happening around us and that we are able to influence these events through the recruitment of internal and external resources.

Sense of coherence is made up of three components: First, it encompasses a sense of comprehensibility. People who have this sense of comprehensibility feel that they can approach all experiences, including novel ones, as potentially understandable. They feel less exposed to situations that are chaotic, arbitrary, inexplicable, or difficult to understand. Such people are therefore able to see any arising problems or stress factors within a broader context. Secondly, people who experience a sense of manageability are convinced that the problems they encounter in life can be solved. They feel competent in their ability to manage available resources, or to acquire them, in order to deal with even the most difficult of demands. These resources do not necessarily have to be their own. However, they have confidence that problems can be solved with the help of other people or of higher forces if necessary. Thirdly, Antonovsky emphasizes a sense of meaningfulness as the most important component. This mostly concerns how far someone feels his or her life to be emotionally meaningful and has aims that are worth striving for.

These three components of sense of coherence are not always individually detectable through factor analysis with the SOC questionnaire developed by Antonovsky. However, in principle, the questionnaire items can be considered to reflect these components to a different degree. It should also be mentioned that there is considerable overlap of these ideas with similar concepts (dispositional optimism: Scheier & Carver, 1987; hardiness: Kobasa, 1982; locus of control: Rotter, 1966; self-efficacy: Bandura, 1977). Also, there are high correlations of SOC with anxiety, neuroticism, and depression. This has led some authors to deny the status of SOC as an independent construct (Geyer, 2000; Schmidt-Rathjens, Benz, van Damme, Feldt, & Amelang, 1997). Mlonzi and Strümpfer (1998) arrive at a more nuanced conclusion. They analyzed the correlation of sense of coherence with the secondary factors of the 16PF questionnaire after Cattell. They found a significant correlation with the factor “anxiety” \((r = -0.52)\) in this study, but an equally significant connection with four secondary factors. They conclude, therefore, that Antonovsky’s SOC is a highly complex personality disposition that cannot be explained solely through its high negative correlation with “anxiety.” Current research is not sufficiently advanced to allow more definitive conclusions concerning this (Bengel, Strittmatter, & Willmann, 1998, p. 44).

Concerning the coping process of mothers with deaf and hard-of-hearing children, an important question is what role does sense of coherence play in dealing with stress situations? Its main function is usually seen to be that it heightens flexibility in the face of new demands, by activating the appropriate resources according to the situation. SOC may “work as a flexible directing principle, as a conductor who orchestrates the implementation of different coping styles according to the demands to be met” (Bengel et al., 1998, p. 30). In his argument concerning functionality of sense of coherence, Antonovsky closely follows Lazarus (1991), whose stress theory differentiates between an appraising process (primary appraisal, secondary appraisal, reappraisal) and the coping process itself. In the context of hearing impairment, the following deduction concerning the quality of the coping process may be made: A parent with a strong SOC feels confident in his or her ability to make an internal assessment of the situation and then to choose and pursue an appropriate strategy for coping with the stressor (in this case, the situation brought about by diagnosis). This does not mean that suffering and sorrow are somehow spirited away, but rather that they can be integrated into the parent’s life. However, as many authors following Antonovsky have pointed out, SOC is not really a special coping style but rather has a higher functionality by helping to take the measures appropriate to the specific situation and specific individual.

The evolution of sense of coherence, according to Antonovsky (1987), takes place in the course of childhood and adolescence. Experience gained during this phase is particularly relevant for the development of sense of coherence. If there are many internal and external resources available during this time—Antonovsky talks of “generalized resistance resources,”
including individual factors (e.g., physical factors, intelligence, etc.) but especially social and cultural factors such as social support, financial options, and cultural stability—there is a good chance that a strong sense of coherence will develop. Antonovsky sees even larger opportunities of change in adolescence because of the many reorientation processes natural to this phase. At about the age of 30, however, sense of coherence in his opinion is relatively firmly formed and thereafter remains largely stable.

Although according to Antonovsky’s theory a person’s sense of coherence is more or less completed in adulthood, the validity of the stability hypothesis is under discussion: Many researchers hold conflicting opinions, and the available statistical studies arrive at different conclusions (Sack, Künebeck, & Lamprecht, 1997; Sack & Lamprecht, 1994; Sandell, 1997). If we see the theoretical discussion concerning consistency of SOC in the light of more recent approaches in identity research (see Keupp et al., 1999), it may be better viewed not as a fixed asset once gained, but as something to be recreated over and over in the course of life. The need to recreate also implies the ability to recreate.

The aim of the study presented here is to describe and clarify the relevance of sense of coherence as a personal resource in the coping process of mothers of deaf and hard-of-hearing children.

Since Antonovsky assigns to sense of coherence something like a control function in stress management, we must examine whether that is the case and, if so, its relative importance in relation to other factors relevant to coping. There are now several empirical studies describing relevant factors in the coping process of mothers of handicapped children. The recent metaanalyses of Scorgie, Wilgosh, and McDonald (1998) and Yau and Li-Tsang (1999) have extracted the essential variables that help or hinder coping for families with handicapped children (see also Li-Tsang, Yau, & Yuen, 2001; Wilgosh, Scorgie, & Fleming, 2000). Even though coming to terms with a child’s handicap is always a highly individualized process, with various factors coming into play in varying intensity (Yau & Li-Tsang, 1999, p. 41), certain aspects appear to be universal. Other than socio-economic status and education level, these include personal resources (e.g., problem-solving abilities, self-efficacy, locus of control, optimistic view of life, etc.), social resources (e.g., support from partner, family members, relatives, friends, acquaintances, experts, self-help groups, etc.), and child variables (e.g., extent of handicap, age, sex, additional handicap, temperament, etc.). All of these affect the level of stress reported by parents and the degree of life satisfaction and quality they feel they can achieve. There are also a number of studies within the specific field of coping research in families with deaf and hard-of-hearing children that arrive at similar conclusions (e.g., Backenroth, 1984; Calderon & Greenberg, 1999; Lederberg & Golbach, 2002; Morgan-Redshaw, Wilgosh, & Bibby, 1990; Pipp-Siegel, Sedey, & Yoshinaga-Itano, 2002).

The role of SOC as a personal resource in the coping process of parents of deaf and hard-of-hearing children has not been previously researched.

Theoretical Model

We have developed a theoretical model formulated as a path diagram, which was tested empirically in the present study (see Figure 1). The model links some of the personal, social, and child-related variables that have proved especially significant, both theoretically and empirically, in previous studies on the stress situation of mothers of deaf and hard-of-hearing children. In addition, the model includes a communication mode factor. This last aspect is especially relevant for the situation of the education of the deaf and hard-of-hearing children in Germany, which is still dominated by methodological debate on the issue of sign versus oralism.

Sense of coherence (as a personal resource) and experienced social support (as a social resource) are considered relevant factors influencing stress processing and (re-) achievement of life satisfaction (Calderon & Greenberg, 1999; Hintermair, Lehmann-Tremmel, & Meiser, 2000; Meadow-Orlans, 1994; Quittner, Glueckauf, & Jackson, 1990). In addition, an additional handicap of a deaf or hard-of-hearing child (Beyzavi, 1993; Hintermair, 2000; Hintermair et al., 2000; Meadow-Orlans et al., 1997, Pipp-Siegel et al., 2002) as well as the child’s hearing status (Calderon & Greenberg, 1999; Frey, Greenberg, & Fewell, 1989; Henggeler, Watson, Whelan, & Malone, 1990; Hintermair & Horsch, 1998; Hintermair et al., 2000) are treated as stress-intensifying factors. With regard to
the means of communication used, we adopt the majority opinion in psychological literature that the decisive factor for a deaf or hard-of-hearing child’s successful psycho-social development is an adequate, working, and child-centered use of a language communication system, regardless of modality (Greenberg, Kusche, & Speltz, 1991). We assume therefore that the communication modality does not affect the mothers’ stress experience (indicated by a dotted line).

Since many of these factors have been shown to intercorrelate, additional covariances were integrated in the theoretical model. These included (inter alia) the relationship between social support and personal resources (Flannery & Flannery, 1994; Vuori, 1994) and the connection between additional handicap and social support (Hintermair et al., 2000; Meadow-Orlans, Mertens, Sass-Lehrer, & Scott-Olson, 1997).

Socialization Theory

The following section indicates why the variables in the theoretical model are of particular importance in considering mothers of deaf and hard-of-hearing children.

The role of mothers in the parenting process. While the moral discourse concerning male and female roles in parenting has shifted to a position where roles are shared more equitably, in most Western societies social realities tell another story. Mothers, not fathers, still spend much more time on caregiving and parenting. In all probability, this is no different for families with children with hearing impairment. It may even be exaggerated, in view of the perception of “special education” for such children. In a German study on the situation of families with handicapped children, Engelbert (1999) was able to show clearly that it is still the mothers who are responsible for parenting, care, and stimulation. Parental task sharing seems to be especially difficult when a child is handicapped (see also Bristol & Gallagher, 1986; Li-Tsang et al. 2001, S. 68). Engelbert (loc. cit., p. 289f) holds the opinion that intensified stress due to the handicap of a child may lead to the re-traditionalization of family roles, favoring long-familiar role patterns. Mothers of handicapped children are thus especially challenged in their parenting tasks, and the question of resources is particularly vital.

The role of the child in modern times. During the last 80 years, the meaning of children to their parents in western societies, and consequently the status of children, has changed drastically (for an overview of the situation in Germany, see for example Beck-Gernsheim, 1998, chapter 5). While in earlier times the rationale for child bearing and child rearing was largely economic, today parents hope to satisfy emotional needs through their children. Because of this, parents have been increasingly held responsible by society for raising children successfully, especially in the early years. They can no longer lightly afford to make mistakes which may have irreversible consequences for their child’s chances in life. Parenting seems possible only if one acquires enough information and has sufficient commitment. Parents with (hearing-) impaired children thus are confronted with a highly challenging situation: They are usually caught in the net of parenting advice and rules of behavior that is hard to escape without risking reproach. Since mothers
generally face the task of parenting to a greater extent than do fathers, they not only carry the major burden of care, but can also carry a high responsibility for the quality of parenting for their (deaf and hard-of-hearing) child.

Early development of attachment with children. Important insights into the success of parenting efforts have been reported from the findings of attachment research (see Ainsworth, Blehar, Waters, & Wall, 1978; Main, 1995). According to these, attachment qualities are very important for child development, and the sensitivity of the child’s attachment figures has a pivotal role here. The child’s development is especially endangered when a (hearing) impairment is diagnosed and the child may be sent signals that may be interpreted incorrectly, and which may require expert knowledge and intervention. Again, the mother will feel a challenge to her responsibility for her (handicapped) child. She must now explore this ambivalent network of fears, hopes, and wishes in the context of her changed life perspective. And, not least, she will always be confronted with the expectations of various social authorities that she spend a great deal of time and energy on raising her handicapped child.

The stress experience of mothers of (hearing-)impaired children and their subjective life satisfaction thus seem especially at risk. Under these conditions, we ask whether sense of coherence might assume a particular stress managing function, as postulated in Antonovsky’s theory (1987).

Method

Participants

The study presented here was carried out by questionnaire survey from October to December 2000. Ten schools for deaf and hard-of-hearing children in North Rhine-Westphalia, the most densely populated German state, were included.

The parents were contacted through the schools, which forwarded the questionnaires to all families with children up to middle school level. The children’s ages, accordingly, were between 1 and 13 years ($M = 8.13; s = 3.1$). The parents had a choice of either sending in the filled-in questionnaire directly or handing it back in a sealed envelope, with the school passing on the questionnaires to the university in bulk. Three hundred thirty of 1395 questionnaires originally issued (23.7%) were suitable for the final evaluation. Forty-seven parents were excluded from this analysis because of missing data for various demographic characteristics. The empirical analysis thus used 283 questionnaires (mothers: $N = 235$; fathers: $N = 48$). Only the mothers’ sample is dealt with here.

The sample’s representative character was checked by comparing the educational status of the responding group with the distribution of educational status in the overall population of Germany. For comparison, we used data from the Statistisches Bundesamt (Federal Statistical Office) on the distribution of population and gainful employment in Germany as of April 1998 (Statistisches Bundesamt, 1998) and correlated the data listed there with the school-leaving qualifications of the mothers in our sample. The comparison showed statistically relevant differences ($\chi^2 = 21.26; d/f = 2, p < .000$). Mothers with low school-leaving qualifications were underrepresented in the sample, while the group of mothers with high school-leaving qualifications was overrepresented compared to the distribution in the overall German population.

Statistical Verification of the Theoretical Model

The theoretical model (see Figure 1) was tested empirically by means of path analysis. Path analysis allows a statistical determination of the relative importance of various variables within a theoretically founded model. The path analysis was calculated with LISREL 8.50 software. For analysis, the respective parametrical conditions of relevant variables were calculated by way of the additional program PRELIS 2.50, which generated input masks that allow optimum calculation.

Instruments and Measures

Sense of Coherence questionnaire (SOC/Short Form). We used the short form of Antonovsky’s SOC questionnaire in a version authorized for Germany. The thirteen questionnaire items of the short form are supposed to cover basic attitude towards life in terms of dispositional orientation. Thirteen items were used, with a 7-point
rating scale. Sample items include: Do you feel rather indifferent about what goes on around you, at times? How often do you feel the things you do are meaningless? Do you sometimes feel you are in an unfamiliar situation and you do not know what to do? Have you ever felt unlucky? How often do you have feelings that make you fear you are losing control?

In order to test the content structure of the coherence concept, we carried out a factor analysis (main components analysis) with subsequent varimax rotation. The resulting two-factor solution accounted for 45.4% of overall variance. The load pattern indicated a general factor, F1, accounting for just under 30% of the variance. Items of all three components load on this factor. The items for comprehensibility and meaningfulness in particular meet in this factor almost exclusively and with partly very high values. Three items load on the second factor F2, which accounts for roughly 15% of overall variance. This factor is uneven and cannot be clearly interpreted since it contains items from two components. The factor analysis result thus suggests that further analyses should use the overall scale values rather than individual component scores. This is in accordance with the results of many other studies (e.g. Broda, Bürger, & Dinger-Broda, 1995, p. 117; Dana, Hoffman, Armstrong, & Wilson, 1985; Frenz, Carey, & Jorgensen, 1993; Hawley, Wolfe, & Cathey, 1992; Holm, Ehde, Lamberty, Dix, & Thompson, 1988; Sack et al., 1997), which also suggest that the overall value of the SOC questionnaire is more reliable and valid than subscale scores.

The available studies regarding the questionnaire’s reliability show very satisfactory values for internal consistency (Cronbach’s alpha of .82 and higher) and test-retest reliability with time intervals of 7 to 30 days (r = .92 and higher). A reliability check of our own sample for internal consistency yielded very satisfactory results as well (Cronbach’s alpha = .80).

Stress questionnaire (SOEBEK). Krause and Petermann’s (1997) questionnaire on the social orientation of parents of handicapped children includes a 20-item stress scale that (with the exception of 2 items) parents answer by using a 5-step rating scale (from “never true” to “true very often”). The authors point out that, regardless of the multitude of stress factors covered by the scale, 12 of the 20 items have a special relevance to stress caused by caregiving, therapy, and interaction with the handicapped child. Sample items include the following: I feel that my child’s handicap is serious; I feel overtaxed in raising my child; I feel I’m under pressure in raising my child; I think I’m in good health.

The scale’s reliability regarding internal consistency shows optimal results for Cronbach’s alpha of .83, and reliability values—depending on the method used—between r = .76 and .85. The reliability check of our own sample for internal consistency yielded very good values as well (Cronbach’s alpha = .84).

Although the SOEBEK stress scale, in contrast to other measures such as the Parenting Stress Index (Abidin, 1995), does not yield differentiated data for different aspects of stress, it is nevertheless a reliable and valid gauge of general subjective stress experience. My own analysis of a (albeit very small) sample of parents of deaf and hard-of-hearing children (Hintermair et al., 2000, p. 62f) showed a highly significant correlation between the SOEBEK stress scale and the Parenting Stress Index Total Domain Score (r = .91, p ≤ .001). There was also a highly significant correlation between the stress score and both PSI subdomains (Child Characteristics Domain, r = .84, p ≤ .001; Parenting Characteristics Domain, r = .83, p ≤ .001). Sarimski (2001) was able to show similar results with a larger sample of 30 parents with a Down’s syndrome child. Again, there was a significant correlation of the SOEBEK stress questionnaire and both the PSI Total Domain Score (r = .87, p < .001), Child Characteristics Domain (r = .70, p < .001) and Parenting Characteristics Domain (r = .80, p < .001).

Life satisfaction scale. A measure of psychological well-being was used in order to assess its relation to SOC. In previous studies (Hintermair et al., 2000), mothers responded to two items (I am satisfied with my life as it is right now; I am satisfied with the way I feel right now) using a 5-step rating scale, from “not true at all” to “very true.” An internal consistency check showed a Cronbach’s alpha value of .81. This reliable measure of overall life satisfaction or subjective well-being provides additional information beyond that of stress experience.
Social support. Experienced social support was measured by responses to a single item (I am satisfied with the support I receive from my social environment [family, relations, parents, friends, acquaintances, etc.]) on a 5-step rating scale. This provides a necessarily approximate assessment of their currently experienced social-support situation (which must, of course, be treated with caution) in relation to SOC.

Demographics. On an additional sheet, mothers gave information about various data concerning themselves and/or their children. In this way we received information about age, sex, additional handicaps, cochlear implants, and hearing status of the children and the mothers, as well as the mothers’ educational status and the means of communication used in the family (speech/sign). We also received information about the time interval since diagnosis.

Results

Before presenting the empirical realization of the path model, other relevant findings are summarized:

- Regarding the strength of sense of coherence, the mean value of SOC for mothers of deaf and hard-of-hearing children ($M = 63.6, s = 12.3, N = 235$) was comparable to that of a German random female sample ($M = 64.0, s = 12.1, N = 766$; Franke, Elsesser, Sitzler, Algermissen, & Köttel, 1998) as well as that of a German representative female sample ($M = 64.3, s = 11.5, N = 1089$; Schumacher, Gunzelmann, & Brähler, 2000).

- The mean measure of stress ($M = 35.8, s = 10.1, N = 235$), using the standardization sample of the validation process for the mothers’ sample, was generally low (the mean value of 35.8 corresponds to the 15th percentile). This suggests that, overall, successful coping seems to have taken place in this sample with slightly older children ($M = 8.13, s = 3.1$; for a discussion of current stress values for mothers of deaf and hard-of-hearing children in different age groups see Lederberg & Golbach, 2002). However, the distribution of scores indicates some high values. High stress values do not appear to be correlated with the age of the child ($F = 1.23, df = 1, p \leq .27$).

- One-factor ANOVAs with the demographic information as independent variables and the SOC as dependent variable showed a significant result only for educational status ($F = 3.86, df = 2, p \leq .02$). This is in accordance with the results of several other studies (for an overview, see Geyer, 1997). The Scheffe test established that it is the difference between parents with an elementary education (Grundschule and/or Hauptschule; $M = 62.9$) and parents with secondary education qualifications (Abitur) or a university degree ($M = 67.4$) that was significant (parents with intermediate qualification [Realschule], $M = 64.0$).

The time elapsed since diagnosis failed to correlate with SOC. We compared the SOC value for mothers for whom diagnosis was less than a year previously with that of all other parents ($M_{<1\text{ year}} = 64.5; M_{>1\text{ year}} = 64.3; F = .01, df = 1, p \leq .93$). Even though the available data are not longitudinal, so that we cannot make any statements about individual courses of change and above all about the strength of sense of coherence before diagnosis, we can nevertheless surmise that the parents’ sense of coherence does not suffer a setback (at least not a severe or persisting one) through diagnosis (for a differing view, see Margalit, Leyser, & Avraham, 1988). On the contrary, these findings support the view, in accordance with Antonsky’s theoretical position, that the strength of sense of coherence at the time of diagnosis is an important factor helping (or hindering, as the case may be) parents to deal or cope with the child’s impairment in an adequate way. This view is also supported by qualitative data collected from the mothers about their (remembered) experience at the time of diagnosis and the present (not reported here) (Hintermair, 2002).

### Table 1 Statistical index values of model variables with interval/ordinal scale level

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>M</th>
<th>s</th>
<th>Median</th>
<th>Skewness</th>
<th>Kurtosis</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOC</td>
<td>235</td>
<td>63.6</td>
<td>12.3</td>
<td>—</td>
<td>-.33</td>
<td>-.46</td>
</tr>
<tr>
<td>STRS</td>
<td>235</td>
<td>35.8</td>
<td>10.1</td>
<td>—</td>
<td>.46</td>
<td>-.33</td>
</tr>
<tr>
<td>ZA</td>
<td>235</td>
<td>6.9</td>
<td>1.9</td>
<td>7.0</td>
<td>-.29</td>
<td>-.26</td>
</tr>
<tr>
<td>ZUU</td>
<td>235</td>
<td>3.3</td>
<td>1.3</td>
<td>3.0</td>
<td>-.24</td>
<td>-1.13</td>
</tr>
</tbody>
</table>

Index: SOC = sense of coherence; STRS = parental stress; ZA = overall life satisfaction; ZUU = social support; BEH = additional handicap (1 = no, 2 = yes); HRVN = hearing status of the child (1 = moderately hard of hearing: <70 dB; 2 = severely hard of hearing: 71–90 dB; 3 = profoundly deaf: >90 dB); LOGN = parents’ use of signs (1 = no; 2 = yes).
Tables 1, 2, 3, 4, and 5 show the outcome of measurements, the correlations of the model variables and the structural equations. Figure 2 shows the graphic realization of the path model. Major findings are enumerated below.

1. The theoretical model (Figure 1) is confirmed by the empirical data ($\chi^2 = 1.61$; $df = 3$; $p = .658$). The sample size of $N = 235$ may be considered sufficient for minimizing the risk of erroneous conclusions (Backhaus, Erichson, Plinke, & Weiber, 1996, S. 425).

2. Thirty-eight percent of stress experience variance, and 37% of overall life satisfaction variance, can be explained by the variables integrated into the model. Path direction is the same as in the theoretical model in all cases, i.e. hypothesized causal connections between the individual variables may be considered as generally statistically safe. It must be recorded, however, that 62% or 63% of the model variance cannot be explained by the variables.

3. Sense of coherence (SOC) performed in a manner congruent with Antonovsky's formulation with respect to stress processing (STRS). Mothers with a stronger sense of coherence had an advantage in coping with the experience of raising a deaf and hard-of-hearing child over mothers with lower SOC scores (path coefficient of $- .39$). Sense of coherence was of relatively greater importance than that of experienced social support (ZUU, $- .25$), bearing in mind that interpretation of this factor must rest on responses to a single question. Overall, the model confirms that both personal and social resources play an important role in coping with an impairment, as suggested by coping theory. Also in line with expectations was the finding that personal resources are more important in coping with a crisis or critical event in life than external resources (Ell, Mantell, Hamovitch, & Nishimoto, 1989; Schröder, 1997, p. 337; Willutzki, 2000, p. 196).

4. Overall life satisfaction (ZA) showed a different, and complementary, pattern to stress processing (STRS). Although sense of coherence (SOC) had both direct (.18) and indirect effects (by way of stress experience, $-.20$) on this factor, experienced social support (ZUU) seemed to be relatively more important here (.38). Findings of other studies support the importance of available social resources for the general subjective well-being of mothers with handicapped children (Hintermair et al., 2000).

5. The extent of the child’s hearing loss (HRVN, .17), and especially an additional handicap of the deaf or hard-of-hearing child (BEH, .27) were stress-intensifying factors in the mothers’ coping process. Once again, there is empirical support for the higher stress situation of this group.

6. The means of communication used in raising

<table>
<thead>
<tr>
<th>Table 2</th>
<th>Statistical index values of model variables with nominal scale level</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>1 (N)</td>
</tr>
<tr>
<td>BEH</td>
<td>235</td>
</tr>
<tr>
<td>HRVN</td>
<td>235</td>
</tr>
<tr>
<td>LOGN</td>
<td>235</td>
</tr>
</tbody>
</table>

Index: SOC = sense of coherence; STRS = parental stress; ZA = overall life satisfaction; ZUU = social support; BEH = additional handicap (1 = no, 2 = yes); HRVN = hearing status of the child (1 = moderately hard of hearing: <70 dB, 2 = severely hard of hearing: 71–90 dB, 3 = profoundly deaf: >90 dB); LOGN = parents’ use of signs (1 = no; 2 = yes).

<table>
<thead>
<tr>
<th>Table 3</th>
<th>Correlation matrix of model variables (polychoric correlations)</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZA</td>
<td>1.00</td>
</tr>
<tr>
<td>STRS</td>
<td>$-.45^{***}$</td>
</tr>
<tr>
<td>SOC</td>
<td>$-.40^{***}$</td>
</tr>
<tr>
<td>ZUU</td>
<td>$-.53^{***}$</td>
</tr>
<tr>
<td>BEH</td>
<td>$-.16^*$</td>
</tr>
<tr>
<td>HRVN</td>
<td>$-.08$</td>
</tr>
<tr>
<td>LOGN</td>
<td>$-.08$</td>
</tr>
</tbody>
</table>

Index: SOC = sense of coherence; STRS = parental stress; ZA = overall life satisfaction; ZUU = social support; BEH = additional handicap (1 = no, 2 = yes); HRVN = hearing status of the child (1 = moderately hard of hearing: <70 dB, 2 = severely hard of hearing: 71–90 dB, 3 = profoundly deaf: >90 dB); LOGN = parents’ use of signs (1 = no; 2 = yes).
a deaf or hard-of-hearing child (LOGN) had no effect on the mothers’ stress experience (−.04). This result is in conformity with our hypothesis and with other studies showing that language modality need have no relevance for predicting stress experience (Pipp-Siegel et al., 2002).

Discussion

A number of variables, tested through questionnaire items, were found to account for a significant part of the variance in reported experience of stress and overall life satisfaction (around 40%). Thus, while the variables examined do not account for most of the variance in these factors, nevertheless their influence is considerable. In particular, we have identified sense of coherence as an important intervening variable that, through its moderating effect on reported stress, appears to play an important role in perceived quality of life for mothers of hearing impaired children.

If we compare the data of this study in terms of the theoretical aspects of role and responsibility attribution in the socialization process in the family that we have outlined (see above), sense of coherence (SOC) can be distinguished from a measure of social support (ZUU) in relation to the mothers’ subjective stress experience (STRS) in coping with the child’s hearing impairment and the tasks to be dealt with in raising the child. Antonovsky (1987) points out that sense of coherence is especially important in coping with stress situations, and this link is specifically reaffirmed by our findings. If it is still mothers—especially those of handicapped children—who bear the brunt of work of parenting and caregiving, we must assume that they are particularly exposed to various kinds of stressors. At the same time, sense of coherence can be viewed as a personal approach for tackling necessary tasks in a constructive way. Mothers with a high sense of coherence may be expected to manage experiences with their deaf or hard-of-hearing child more efficiently and therefore relieve strain more readily. (We have been able to document this effect in a separate qualitative study; Hintermair, 2002.)

As well as the importance of sense of coherence and social support, the child’s hearing status (HRVN) and especially an additional handicap (BEH) have a stress-intensifying effect on mothers, as predicted by socialization theory. If the mother is primarily held responsible for the child’s development, and herself accepts that responsibility, it is understandable that the mothers’ stress experience increases with an increased number of stressors (e.g., a hearing impairment and an additional handicap). In the end it is the mothers, after all, who must somehow cope with this situation. This connection is also supported by the findings of other studies (Pipp-Siegel et al., 2002).

Directed counseling and intervention should firstly concentrate on boosting the resources that mothers need for coping and try to diminish the effect of stress-

### Table 4 Structural equations ($\chi^2 = 1.61; df = 3; p = .658$)

<table>
<thead>
<tr>
<th>ZA =</th>
<th>(-.202^{<em>} \text{STRS} + .177^{</em>} \text{SOC} + .384^{*} \text{ZUU} )</th>
<th>Error = .632</th>
<th>$R^2 = .368$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Error</td>
<td>(.063)</td>
<td>(.060)</td>
<td>(.059)</td>
</tr>
<tr>
<td>T Score</td>
<td>-3.20</td>
<td>2.94</td>
<td>6.44</td>
</tr>
</tbody>
</table>

Index: SOC = sense of coherence; STRS = parental stress; ZUU = social support; BEH = additional handicap (1 = no, 2 = yes); HRVN = hearing status of the child (1 = moderately hard of hearing: <70 dB; 2 = severely hard of hearing: 71–90 dB; 3 = profoundly deaf: >90 dB); LOGN = parents’ use of signs (1 = no; 2 = yes).

### Table 5 Structural equations ($\chi^2 = 1.61; df = 3; p = .658$)

<table>
<thead>
<tr>
<th>STRS =</th>
<th>(-.390^{<em>} \text{SOC} - .252^{</em>} \text{ZUU} + .267^{<em>} \text{BEH} + .172 \text{ HRVN} - .043^{</em>} \text{LOGN} )</th>
<th>Error = .619</th>
<th>$R^2 = .381$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Standard Error</td>
<td>(.056)</td>
<td>(.057)</td>
<td>(.055)</td>
</tr>
<tr>
<td>T Score</td>
<td>-6.90</td>
<td>-4.41</td>
<td>4.87</td>
</tr>
</tbody>
</table>

Index: SOC = sense of coherence; STRS = parental stress; ZUU = social support; BEH = additional handicap (1 = no, 2 = yes); HRVN = hearing status of the child (1 = moderately hard of hearing: <70 dB; 2 = severely hard of hearing: 71–90 dB; 3 = profoundly deaf: >90 dB); LOGN = parents’ use of signs (1 = no; 2 = yes).
intensifying factors as far as possible (see Lederberg & Golbach, 2002; Lederberg & Prezbindowski, 2000; Spencer, 2000). For mothers of deaf and hard-of-hearing children, this could mean that, apart from practical help and advice on how to deal with the child, counseling in early intervention could focus especially on boosting or confirming the mother’s sense of coherence and see to it that social relationships, which tend to become brittle in the course of diagnosis, become the object of intense networking efforts (Hintermair et al., 2000). Both aspects seem to be of equal importance for mothers in reducing stress and achieving life satisfaction. There should be additional and perhaps more intense counseling and intervention service offers for mothers with severely deaf children or hard-of-hearing children with an additional handicap, since this group of mothers seems to be stressed particularly highly. The results of Greenberg (1983), Meadow-Orlans (1994), and Pipp-Siegel et al. (2002) confirm the success of an early family-centered counseling and support strategy.

The data also suggest (ANOVA) that sense of coherence is related to mothers’ educational status. We do not possess data on the correlation of sense of coherence and socio-economical status, even though other results (Kaplan, 1995; Lundberg & Nyström, 1995) suggest a close connection. Knowing the importance of sense of coherence for coping with impairment, and in view of the correlation to educational and social status that has been described, the aspect of material resources and their implications for counseling and support concepts cannot be ignored. If material resources (such as money, housing, food, education, etc.) are not available at the appropriate level, any pedagogic intervention, however well-meant or implemented, is bound to fail. In that case, “coherence support” in early intervention and many other more strongly educational measures become mere farce. As Adorno commented, wrong life cannot be lived rightly.

The study presented here is a first attempt at an empirical evaluation of the importance of the sense of coherence for working with parents of deaf and hard-of-hearing children. There is still much that remains to be done. The emerging consequences for further research include the following:

1. Studies that document the development or change of sense of coherence with time, and its influence on the coping process are required to clarify the extent to which SOC is a mutable trait during parenthood.

2. A further study should also include additional control groups (hearing parents/hearing children, deaf parents/deaf children), in order to assess the importance of sense of coherence within the framework of communication diversity.

3. In the present sample, mothers with higher education are over-represented. It remains to be established, therefore, whether the correlations discussed here are representative of the population at large.

4. Finally, there must be also a thorough and detailed study and analysis of the situation of fathers. Above, all therefore, we must obtain sufficiently large samples of fathers, so that the insights gained from the group of mothers can be compared with those of fathers.

References


Received July 1, 2002; revisions received December 12, 2002; accepted January 7, 2003.