Empirical Articles

Structural validity and internal consistency of the Strengths and Stressors in Parenting (SSF) Questionnaire in parents of children with developmental disabilities

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The current study investigated the structural validity and internal consistency of the Strengths and Stressors (SSF) questionnaire. The SSF is used in Swedish habilitation services to measure the positive and negative consequences that the fostering of a child with a developmental disability can have on family functioning in six domains: parent's feelings and attitudes, social life, family finances, relationship to the other parent, siblings, and professional support. The proposed six-factor model was tested with confirmatory factor analysis with data collected from 291 parents of children with developmental disabilities. The six-factor model had an acceptable fit according to most fit indices, but two items were non-significant. Overall, the internal consistency was acceptable or good. The SSF, with the proposed six-factor solution, can be a useful tool when assessing parental perspectives on the impacts of having a child with a developmental disability in clinical settings and research.

Key words: Developmental disabilities, family, family function, parent, strength, stress..

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INTRODUCTION

Many studies investigating functioning in families with a child with a developmental disability rest on the assumption that the child works as a stressor on the family system that, as such, could lead to negative impacts, not least on parents' well-being (McConnell & Savage, 2015). Not surprisingly, evidence demonstrates that parents in such families are at risk of developing problematic levels of stress and mental health issues (Lee, 2013; Miodrag & Hodapp, 2010). However, focusing solely on stress and other negative impacts on parents may lead to a simplistic model of family functioning in families with a child with a developmental disability (Hastings, 2016). Designing and applying instruments with sound statistical properties that acknowledge the complex nature of the impacts on the family system of fostering a child with a developmental disability is key to the advancement of the quality of research and clinical practice in this field. The Strengths and Stressors in Parenting (SSF; Falck & Ternert, 2016) Questionnaire is a scale commonly used in habilitation services in Sweden to measure conceivable negative and positive impacts on family functioning, for which psychometric properties are yet to be explored. The present study seeks to examine the structural validity and internal consistency of the scale.

Family functioning has been studied as both an outcome in its own right (Al-Krenawi *et al*., 2011; Altiere & von Kluge, 2008) and a factor influencing other outcomes, such as parental mental health (Blacher *et al*., 1997; Magaña *et al*., 2004; Magaña *et al*., 2006) or child behavior problems (Sikora *et al*., 2013).

Still, the possible positive effects of raising a child with a developmental disability have long been overlooked (Hastings & Taunt, 2002). However, the attention paid to this area seems to have grown over the last decades (Beighton & Wills, 2019). Understanding positive aspects of family functioning could be important, as there is great individual variation in the effect a child with a developmental disability has on parental well-being, and there is a large degree of complexity in the associations between child disability status and parental outcomes, where both risk and protective factors play a role for the outcome (Olsson, 2008).

There are many examples of scales designed to measure stress and strain related to parenting in general, such as the Parenting Stress Index (Abidin, 1983), the Parental Stress Scale (Berry & Jones, 1995), and to the parenting of children with developmental disabilities in particular, such as the Autism Parenting Stress Index (Silva & Schalock, 2012), the Caregiver Strain Questionnaire (Brannan *et al*., 1997), and the short form of the Questionnaire on Resources and Stress (Friedrich *et al*., 1983). Other scales, such as the Family Needs Questionnaire (Kreutzer *et al*., 1994; Siklos & Kerns, 2006), focus on the unmet needs of parents. A merit of the SSF is that it covers both positive and negative consequences of raising a child with a developmental disability in the broader family system.

The SSF is the result of further development and cultural adaptation of the Family Impact Questionnaire (FIQ), a validated 50-item self-rating scale designed to measure a broad number of possible social, emotional, and psychological impacts on the

family system as perceived by parents (Donenberg & Baker, 1993). Unlike scales focusing on parents' general perceptions of stress, the FIQ explicitly asks how fostering a child with impairments impacts the family system. The items (originally 68 but reduced to 50 in the development of the scale) were chosen to reflect broad dimensions of impact described in earlier research in the field. The six-factor structure of the scale was established through explorative factor analysis. The factors include (1) impacts on social life, (2) negative feelings toward the child, (3) positive feelings toward the child, (4) impact on finances, (5) impact on marriage, and (6) impact on siblings. These factors correspond to areas of impact that probably are relatively universal. However, the instrument was developed in North America, and thus in a cultural context differing from Sweden in terms of both laws and regulations affecting families with disabilities and the values, tasks, and roles assigned to the family and family members. The differences may influence the usefulness of specific items and may also impact the actual factor structure, as seen in the cross-cultural validation of other scales, such as the Autism Parenting Stress Index (Cheung & Yeung, 2021) and the short form of the Parenting Stress Index (Zaidman-Zait *et al.*, 2011).

Some support for the relevance of the FIQ factors for Swedish parents of children with an intellectual disability is provided by a qualitative study (Cederblad, 2013) in which parents were interviewed with a guide based on FIQ items and factors applying a thematic analysis. However, the parents did also touch on important impact domains, e.g., contacts with health care and welfare support systems, that are not covered by the FIQ. The SSF was developed by M. Broberg (personal communication, November 26, 2021) through modifications of the FIQ guided by the results of the interviews. The SSF kept most of the structure identified by Donenberg and Baker (1993) when developing the original instrument but merged the positive and negative feelings about the child into one factor. In addition, a factor about the perception of support from professionals was added, resulting in six factors whereof five are similar in content to the factors in the FIQ: feelings and attitudes about parenthood, impact on social life, impact on family finances, relationship to the other parent/partner (impact on marriage), and impact on siblings. The wording was changed for some items, some were removed, and others were added (see Table S1). Especially, items describing positive feelings and perceptions of the impact were added. The largest changes within a factor concerned the impact on finances. The financial impacts of parenting a child with a developmental disability on individual families may be lower in Sweden, where care and services for children with disabilities are almost fully financed through taxes, compared with countries where parents finance services by themselves.

The psychometric properties of the SSF have not been systematically assessed apart from the internal consistency of a set of subscales (each of the six scales was divided into a positive and a negative subscale) being reported in a master's thesis (Falck & Ternert, 2016). The current study aims to investigate the factor structure of the SSF when responded to by Swedish parents of children with developmental disabilities. More specifically, the goals are (1) to test if the SSF factor structure suggested by the scale's developer, M. Broberg (personal communication,

November 26, 2021), and the factor structure identified in the FIQ (Donenberg & Baker, 1993) are supported by confirmatory factor analysis and (2) to examine if the fit of the model can be improved by modifications within the given structure (i.e., by adding intra-factor covariances). Finding evidence to support or reject the six-factor structure is important since the scale is already in use in habilitation services in Sweden.

METHOD

The procedure for the study was approved by the Swedish Ethical Review Authority (2019-05028).

Participants

SSF data from two different sources were combined and used in the analyses: (1) the first wave of data collection in a longitudinal study of mental health and participation in children with developmental disabilities ($n = 162$; CHILD-PMH) and (2) the national quality register for the habilitation services in Sweden ($n = 129$; HabQ). All families eligible for participating in the CHILD-PMH study received written information about the project and a consent form via mail. A prerequisite for inclusion in the study was that the consent form was signed by both parents/legal guardians (or the parent/legal guardian with sole custody). Data were then collected via an online survey or mail-delivered paper-and-pen version of the questionnaire based on the preference of the parent(s). For the HabQ participants, informed consent (an opt-out procedure) and data were collected through the habilitation services where the families were enlisted. For the current study, the HabQ data were retrieved from the regional archive in Östergötland. Since both CHILD-PMH and HabQ utilized similar eligibility criteria, i.e., no exclusion of participants based on severity and/or type of diagnosis, ethnicity, or any other participant characteristic, and recruited from habilitation services in Sweden, samples were expected to be equivalent. To be eligible for support from habilitation services in Sweden, a child needs to have a developmental disability such as an intellectual disability, cerebral palsy, autism, or another diagnosis of equal severity, often in combination with one or more other impairments. Children with diagnoses such as ADHD, dyslexia, developmental coordination disorder, or tics lack access to habilitation services in Sweden, and parents of children with such diagnoses are thus not included in the present study. The CHILD-PMH data includes two cohorts of children; one consisting of younger children, aged 3.44–8.27 years at the time of the study, and one with older children, aged 11.12–14.22 years. The majority (66.0%) of children in CHILD-PMH were boys, and 42.6% had a mother who was born in another country than Sweden (42.1% for fathers). More than half (56.9%) of the mothers of children participating in CHILD-PMH had university-level education (to some degree), followed by upper secondary school (29.2%), nine years of elementary school (12.3%), and upper secondary special school (1.5%). The characteristics of the children participating in HabQ were not obtainable for the present study due to the termination of the register, but since all HabQ children were enlisted at a child habilitation service, it can be concluded that all were below 18 years of age.

Material

The SSF is a self-rated questionnaire consisting of a total of 45 items, of which 43 have a four-point ("Not at all" [0], "A little" [1], "Rather" [2], "Very much" [3]) and two a 10-point (ranging from "No stress"/"Lethargic" [0] to "Maximum stress"/"Full of energy" [10]) Likert-type response scale. The latter items are, however, global ratings of stress and energy and are not arranged under any of the six headings that the other 43 items are categorized under and are therefore not included in the present analysis. The six factors are feelings and attitudes about your parenthood (13 items, abbreviated feelings and attitude), impact on your social life (6 items, social life), impact on the family finances (5 items,

finances), relationship to your child's other parent/your partner (8 items, partner), impact on siblings (6 items, siblings), and contact with the support system and professionals (5 items, support system). Nineteen of the 43 items are positively phrased (items 2–4, 6, 10, and 12 from the feelings and attitude factor, 17 and 18 from social life, 23 from finances, 26–28 and 30 from partner, 33, 36, and 37 from siblings, and 39, 40, and 42 from support system) and were reversed when calculating factor sum scores. A full list of the items in the scale is presented in Table S1.

Data analysis

Missing data. After excluding the 16 participants who failed to respond to any of the items in the SSF, the average amount of missing data across items was 5.10%. Seven variables (items 23, 33, 34, 35, 36, 37, and 38) all had substantially more missing data (mean 18.49%, range 17.45–22.55%) than any of the other variables in the data set (mean 2.49%, range 0–7.64%). One plausible explanation is that items 23 and 33–38, in contrast to other items in the scale, refer to circumstances not relevant to all parents of children with developmental disabilities, making them non-applicable to a part of the target population. Items 33–38 all presume the existence of one or more siblings while item 23 presumes that the parents receive childcare allowance, which may be common but not relevant for all parents of children with developmental disabilities. In the FIQ, it is explicitly stated that the respondent should skip the sibling section when not applicable. Apart from the high degree of missingness in variables 23 and 33–38 clustering into three re-occurring patterns (only 23, only 33–38, and 23 in combination with 33–38), no other combination of missing items occurred more than three times, indicating that the missing at random assumption may be plausible. The average level of missingness in items 1–22, 24–32, and 39–43 was below the 5% level described as a small amount of missing information by Schafer (1999) and the 10% (or more) level where missing data could lead to bias in subsequent analyses according to Bennett (2001). Thus, because there are plausible explanations for the higher rate of missing data in items 23 and 33–38 not relating to flaws in the design of items or the questionnaire, and that missingness was low for the rest of the data, multiple imputations by chained equations (with R package mice) was a reasonable approach to treat missing data. The imputation was based on all the items in the SSF. Five data sets were imputed and the below-mentioned analyses were conducted on each imputed data set separately first and then pooled by averaging results from the analyses.

Confirmatory factor analysis. A series of confirmatory factor analyses (CFA) were conducted. The model investigated in the analysis was based on the theoretical structure implied in the SSF questionnaire, with each of the six headings considered a latent variable and the items below the heading its manifest indicators. Due to the ordinal nature of the items, the WLSMV estimator, a robust version of diagonally weighted least squares, was applied. No residual correlations were included in the initial model, but it was decided, a priori, that a second model, with all reasonable modifications to improve fit to data, would also be tested. Since correlations between measurement errors in variables manifesting the same latent variable are relatively likely to occur and could have reasonable explanations, all possible residual correlations between such variables, with a potential to improve the fit of the model (i.e., modification index larger than four), were added to the model sequentially. A combination of different measures was used to evaluate the fit to data and to compare the fit of models: the comparative fit index (CFI), the standardized root mean squared residual (SRMR), the root mean square error of approximation (RMSEA), and the χ^2/df. The indices were chosen since they represent different aspects of fit, have specific advantages and disadvantages, and thus complement each other. The χ^2 difference test is, for example, strongly related to sample size, while CFI is less so (Schermelleh-Engel et al., 2003). The fit indices of the models were evaluated against commonly applied cutoff criteria for acceptable fits (≤ 2 for χ^2/df, <0.06 for RMSEA, and ≥ 0.95 for CFI) suggested by Hu and Bentler (1999). It is, however, important to note that these recommendations are for continuous data and, even though Schreiber et al. (2006) suggest the same cutoffs for RMSEA and CFI for categorical data, Xia and Yang (2019)

demonstrated that diagonally weighted least squares lead to unexpected values in both indices. Comparisons between nested models were conducted based on the difference in χ^2.

Internal consistency. Cronbach's alpha (α) was calculated for each factor to describe internal consistency. The magnitudes of alpha were labeled according to the rules of thumb suggested by George and Mallery (2003): "excellent" for $\alpha \geq 0.9$, "good" for $0.9 > \alpha \geq 0.8$, "acceptable" for $0.8 > \alpha \geq 0.7$, "questionable" for $0.7 > \alpha \geq 0.6$, "poor" for $0.6 > \alpha \geq 0.5$, and "unacceptable" for $\alpha < 0.5$. Items focusing on positive impacts or aspects of having a child with a developmental disability in the family were reversed before Cronbach's alpha was calculated. Cronbach's alpha was also calculated for the CHILD-PMH and HabQ data separately to control for possible differences between the subsets.

Software. All analyses were conducted in R (Version 4.1.2; R Core Team, 2021) and RStudio (Version 2022.2.0.443; RStudio Team, 2020). The manuscript was produced with the papaja package (Version 0.1.0.9997; Aust & Barth, 2020), data manipulation was done using dplyr (Version 1.0.8; Wickham et al., 2021), and imputations with mice (Version 3.14.0; van Buuren & Groothuis-Oudshoorn, 2011). The fitting of the CFAs was performed with the lavaan package (Version 0.6-10; Rosseel, 2012), and the path diagrams of the models were created with semPlot (Version 1.1.4; Epskamp, 2019). Cronbach's alpha was calculated with the psych package (Version 2.1.9; Revelle, 2021).

Code and data availability. A reproducible version of this manuscript, including the code, can be found at osf.io/vcma5/. The data for this study cannot be publicly shared, but a synthetic data set with similar properties as the original data set has been created with the package synthpop (Version 1.7-0; Nowok et al., 2016) and is also available at the above link.

RESULTS

A graphical representation of the fitted CFA model (CFA1) is depicted in Fig. 1 (for practical reasons, the values reported in the figure are not pooled, but based on the analysis of the imputed data set with the median *RMSEA*). All (pooled) model parameters made significant contributions to the model except item 23 and item 36. However, some items (10, 17, 18, and 33) had relatively low (<0.4) factor loadings, indicating a weak relation to the latent variables they are supposed to measure. Also, the fit indices for the model (see Table 1), pooled for the five imputed data sets, did not meet commonly applied cutoffs, indicating that the model probably did not fit the data adequately.

Internal consistency was good for the feelings and attitudes factor (average Cronbach's $\alpha = 0.85$ across imputed data sets), acceptable for the social life factor (0.70), good for the partner factor (0.82), acceptable for the support system factor (0.80), questionable for the finances factor (0.62), and questionable for the siblings factor (0.60).

The model was then modified in a step-by-step approach by adding the residual correlation between the two items (of the same latent variable) with the highest modification index until there were no more reasonable additions leading to improvement of the model (i.e., a modification index >4 left). One of the residual correlations added (number 51) turned out to be non-significant in a later stage of the process and was removed in the final step. This process ended in a modified model (CFA59), depicted in Fig. 2, with a total of 56 residual correlations added. As with CFA1, all parameters contributed significantly to the model except the loading of item 23 on the finances factor and item 36 on the siblings factor. The fit of CFA59 to the data was better than the fit of CFA1, with χ^2/df, *RMSEA*, and *SRMR* all
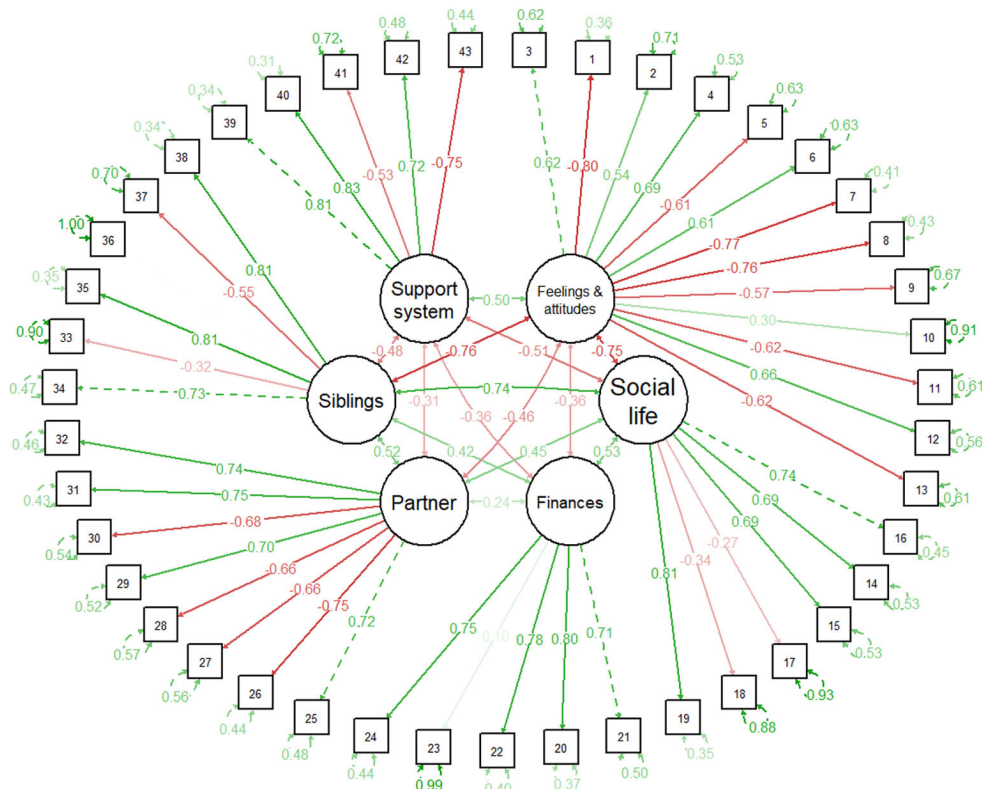
Fig. 1. Graphical representation of the original model (CFA1). *Note*: The circles represent latent variables (the six factors), the squares manifest variables (the items), the single-headed arrows factor loadings, the double-headed arrows connecting latent variables correlations, and the dotted double-headed arrows error variance. Green indicates a positive relationship between the parameters, red a negative, and the intensity of the colors correlates with the strength of the association.

Table 1. *Selected fit indices (χ^2/df, CFI, RMSEA, and SRMR) of the original CFA model (CFA1), the models where all relevant within-factor covariances were added (CFA59), and where the remaining non-significant parameters were removed (CFA60)*

| Model | χ^2 | *df* | *p* (χ^2) | χ^2/*df* | *CFI* | RMSEA | | *SRMR* |
						Estimate	90% CI	
CFA1	1,957.33	845	0.00	2.32	0.82	0.07	0.07–0.07	0.101
CFA59	1,352.15	789	0.00	1.71	0.91	0.05	0.05–0.06	0.079
CFA60	1,246.03	713	0.00	1.75	0.91	0.05	0.05–0.06	0.078

Note: All values are robust. Commonly applied cutoffs for acceptable fit: ≤2 for χ^2/*df*, <.06 for *RMSEA*, ≤0.08 for *SRMR*, and (≥0.95) for *CFI* (Schreiber *et al.*, 2006). Abbreviations used in the table: CI (confidence interval), *CFI* (the comparative fit index), *df* (degrees of freedom), *RMSEA* (root mean square error of approximation), and *SRMR* (standardized root mean squared residual).

indicating a level of fit often described as acceptable, while *CFI* remained below commonly applied cutoffs. A χ^2_{diff} test between the models confirmed that the CFA59 model had a better fit to data than the CFA1 model (χ^2_{diff} [56] = 631.20, *p* < 0.001). Several items (10, 17, 18, 26, 27, 30, and 33) did, however, have relatively weak (<0.4) standardized loadings on their respective latent variables.

Consequently, a new model (CFA60), without items 23 and 36, was also tested (see Fig. 3). As can be seen in Table 1, the fit of CFA60 was practically equivalent to that of CFA59, with negligible improvements in *CFI*, and a slight deterioration in χ^2/*df*. All observed items made significant contributions to the model, but several of them (the same as in CFA59) still had

relatively low (<0.4) loadings on their theoretically assigned latent variable. Omitting items 23 and 36 from the model led to improved internal consistency in both the finances (average Cronbach's α = 0.76 across imputed data sets) and siblings (0.67) factors. The inter-relatedness of the items in the new finances factor was acceptable but remained questionable for the revised siblings factor. The subgroup analysis, where the internal consistency for factors based on CHILD-PMH and HabQ data was compared, revealed similar results across data sets (Cronbach's alpha confidence intervals were overlapping in all cases). Mean sum scores (and standard deviations) for each factor, with and without the inclusion of items 23 and 36, are displayed in Table 2.
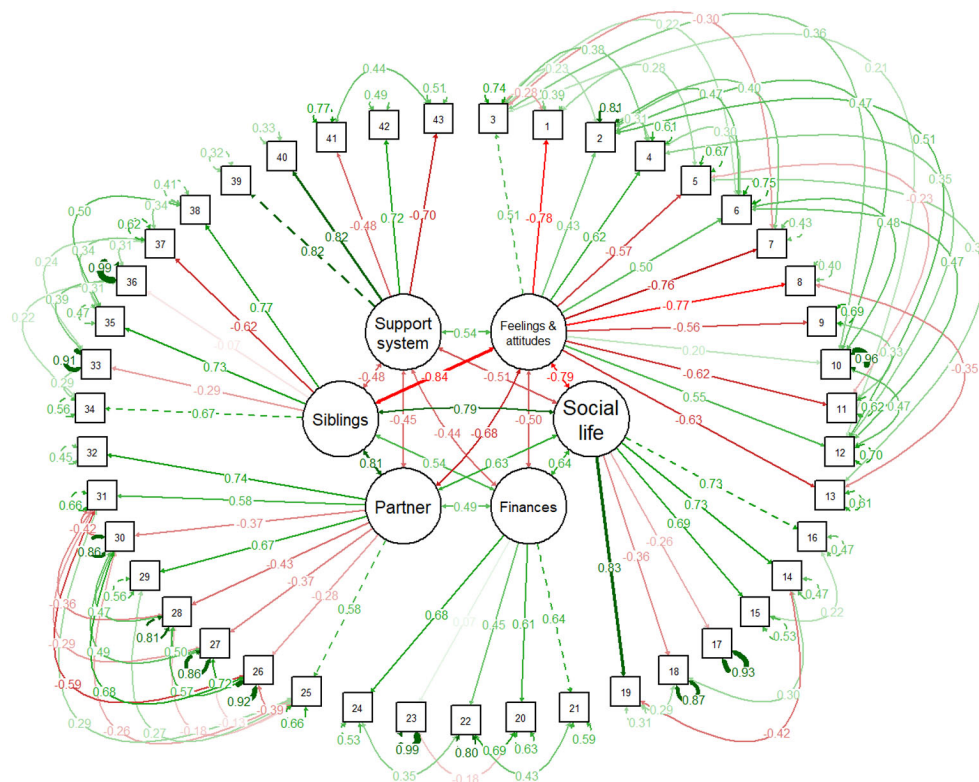
Fig. 2. Graphical representation of the CFA model with added residual correlations (CFA59). *Note*: The circles represent latent variables (the six factors), the squares manifest variables (the items), the single-headed arrows factor loadings, the double-headed arrows connecting latent variables correlations, the double-headed arrows connecting manifest variables the added residual correlations, and the dotted double-headed arrows error variance. Green indicates a positive relation between the connected parameters, red a negative, and the intensity of the colors correlates with the strength of the association.

DISCUSSION

The link between family functioning, perceived parental stress, well-being, and having a child with a developmental disability is complex. To understand this complexity, it is important to investigate how parents perceive the effect that a child with a developmental disability can have on family functioning. Besides investigating possible negative impacts, it is also important to address positive impacts since they may be the best starting point when planning and providing support to families. The present article aimed at examining whether the suggested six-factor model of the SSF, derived from theoretical assumptions and the content validation of the Swedish version of the FIQ (Cederblad, 2013), is supported by a CFA on data from a sample of parents of children with developmental disabilities. A majority of the reported fit indices showed that model fit to data was acceptable or better, given justifiable modifications, when compared with commonly applied cutoffs (Hu & Bentler, 1999; Schreiber *et al.*, 2006). According to Schreiber *et al.* (2006), fit can be considered good if a vast majority of indices indicate it. However, it should be noted that there is uncertainty in which thresholds to apply to ordered categorical data and that diagonally weighted least squares may produce inflated *CFI*s and *RMSEA*s in comparison with maximum likelihood (Xia & Yang, 2019). The *CFI* in the modified models is, albeit low, still not far from the cutoff (0.95) suggested by Hu and Bentler (1999), and it is over the 0.90 threshold Bentler and Bonett (1980) discussed for related fit indices.

Altogether, the six latent variables could generally be said to be indicated by the items in the questionnaire. However, items 23

("The childcare allowance provides a good financial supplement") and 36 ("The other children have matured thanks to their sibling") did not make significant contributions to the models. One possible explanation for why 23 did not contribute to the finances factor is that it, unlike the other items of the factor, does not ask the informant to evaluate an aspect of the financial situation of the family, but rather the parent's opinion about a specific support form (childcare allowance). When it comes to item 36, one possible explanation for its poor performance is that it is difficult for parents to assess maturity in siblings and whether it is affected by the sibling's disability or not. To "complain over his/her behaviour" (item 34) or "help caring for him/her" (item 33) may be easier to assess objectively. While items 23 and 36 are redundant in their respective scales from a purely psychometric perspective, they still may be important questions when assessing family function in a clinical context. Still, the results of the current studies suggest that they should be omitted from their respective factors (finances and siblings) when calculating factor sum scores.

A number of the items with significant contributions to the models did have relatively low factor loadings on their respective latent variables. Four items (10, 17, 18, and 33) had factor loadings under the commonly applied cutoff <0.4 across all three models, while CFA59 and CFA60 had three additional items (26, 27, and 30) weakly relating to their latent variables. However, there are theoretical and clinical reasons for retaining all of them despite this. Most strikingly, all seven items measure potential positive impacts of having a child with a developmental disability
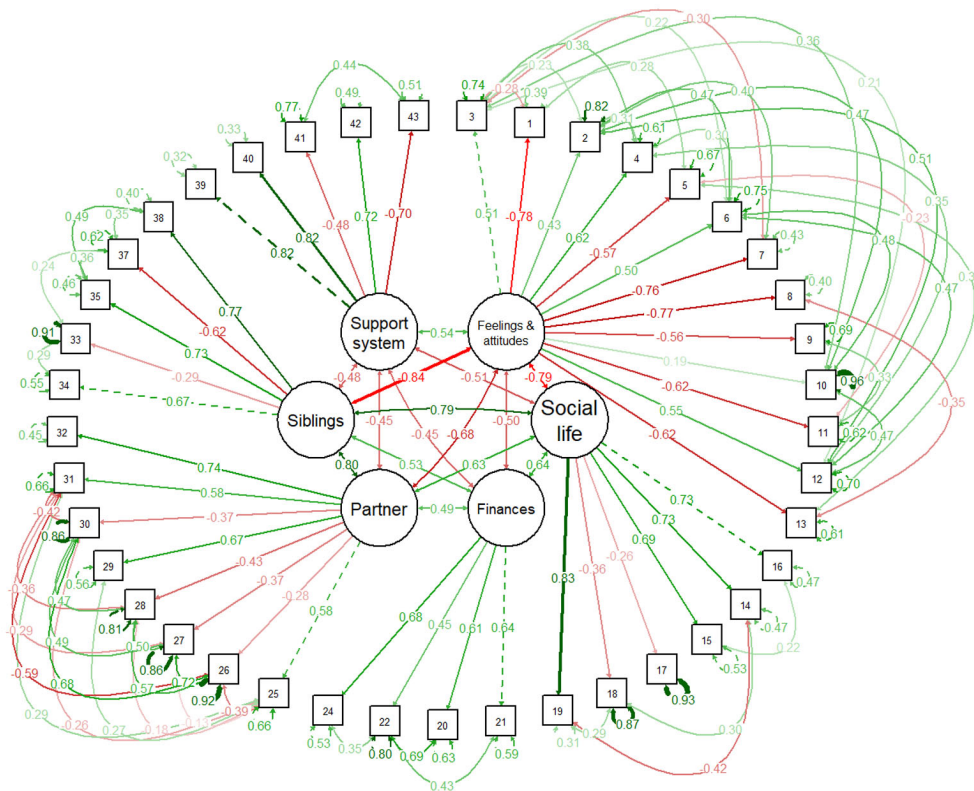
Fig. 3. Graphical representation of the CFA model with added residual correlations after removing the non-significant parameters (CFA60). *Note*: The circles represent latent variables (the six factors), the squares manifest variables (the items), the single-headed arrows factor loadings, the double-headed arrows connecting latent variables correlations, the double-headed arrows connecting manifest variables the added residual correlations, and the dotted double-headed arrows error variance. Green indicates a positive relationship between the parameters, red a negative, and the intensity of the colors correlates with the strength of the association.

Table 2. *Means (*M*) and standard deviations (*SD*) for the sum of items for each factor in the SSF, with and without the non-significant items, for the sample of parents of children with developmental disabilities*

	M	SD	Number of items
Feelings and attitudes about parenthood	18.87	6.68	13
Impact on social life	10.02	3.80	6
Impact on family finances	6.83	3.21	5
Impact on family finances (without item 23)	4.07	3.07	4
Relationship to the child's other parent/partner	11.39	4.99	8
Impact on siblings	10.84	3.34	6
Impact on siblings (without item 36)	8.03	3.15	5
Contact with the support system and professionals	9.73	3.39	5

Note: Scores on positive impact items are reversed. Higher scores indicate more stress (negative impacts). The reported sum scores are the pooled averages across the five imputed data sets.

and, as argued by Hastings (2016), there are important reasons not to limit the scope to just negative impacts when studying family function in this group. When it comes to items 17 ("I have made new friends thanks to my child") and 18 ("I get a lot of support from relatives and friends"), for example, they are the only positively worded items in the social life factor. Another possible explanation for the weaker performance of the items

focusing on negative impacts in the model is that the positive or negative wording, rather than the actual content, made some items appear less relevant than others. The low factor loading of item 10 ("I have matured as a person by being a parent to my child") on the feelings and attitudes factor could also relate to the fact that it does not measure a feeling or attitude, as do the other items in the factor. Rather, it asks the informant to evaluate personal development. Maturity is on the one hand a very non-specific concept that may be interpreted differently by different informants, and on the other hand, an important process that has been described as an effect of parenting in earlier research (Beighton & Wills, 2019). Scale developers have to consider how items can be clustered in subcomponents to make clinical and practical sense. This clinimetric approach may lead to some items being grouped in a subscale based on a certain purpose, e.g., capturing positive aspects of parenting, without those items having a necessarily high statistical relationship to the subscale.

The internal consistency of the factors was in the acceptable (finances, support system, and social life factors) to good (feelings and attitudes and partner factors) range in all but one case (the siblings factor), where it was questionable (even after the removal of item 36). Inferences based on the latter factor score in clinical practice and research should therefore be done with extra caution and with an awareness that this construct may be less coherent than the constructs represented by the other factors. Four of the factors in the SSF are equivalent to factors in the FIQ, suggesting that these factors may be universal for parents of children with a

disability, which can increase the usefulness and facilitate comparisons with other studies. The adjustment of items in the finances factor can be seen as a cultural adaptation, yet the construct, as such, is universal. The sixth factor in the SSF, support system, was an addition to the SSF based on the results of interviews with Swedish parents of children with an intellectual disability, indicating its importance in clinical practice and research (Cederblad, 2013).

LIMITATIONS

One limitation of the present study is that it only investigates structural validity and internal consistency. As such, it gives important insights but not the full picture of the applicability of the SSF in a clinical or research setting. Future studies should complement this picture by exploring other aspects of the validity of the SSF. Unfortunately, it was not possible to investigate the possible effects of child or family characteristics on the factor structure in the present study since such data were unavailable for the HabQ data. The lack of background data in HabQ made direct comparisons of child and family factors between the two subsets of data impossible. Separate SEM analyses of the two subsets were not feasible due to the relatively low number of participants per subset. Still, the fact that recruitment procedures and the internal consistency for the six factors were similar between the subsets of data gives some confidence in their comparability. The effect of child and family characteristics on the fit of the model remains a subject for future studies.

Another possible weakness of the factor structure investigated in the present study is that it presumes the reversing of items when calculating factor scores. The objection here would be that this procedure assumes that the absence of a positive impact automatically implies a negative impact, or vice versa, which could be debated. However, the only way to avoid reversing and at the same time keep a similar factor structure, demonstrated by Olsson *et al.* (2008), would have been to divide each factor in two (positive and negative) and then calculate separate scores for those 12 factors. That would, however, have led to factors with an unacceptably small number of items (<3) in many cases. The aim of this study was not further development of the scale, but future studies could explore ways of avoiding this problem by rephrasing, deleting, or adding additional items.

CONCLUSIONS

This study has confirmed that the suggested six-factor model of the SSF works reasonably well with parents of children with developmental disabilities after several justifiable modifications to the model. However, two items (23 and 36) did not contribute to the model and should be omitted when calculating factor scores. The internal consistency of the factors was acceptable or good in all but one case where it was questionable. The result indicates that the SSF may be a useful tool when assessing parental perspective on the impacts of having a child with a developmental disability on his/her feelings and attitudes, social life, family finances, and relationship with the child's other parent, siblings (with extra caution), and the parent's experience of professional support in a clinical setting and research. Apart from the habilitation setting, where the SSF is already in use in Sweden, it could prove clinically valuable for other service providers offering support to families with a child with a developmental disability such as psychiatric and social services.

CONFLICT OF INTEREST

The authors have no conflict of interest to declare.

AUTHOR CONTRIBUTIONS

Conceptualization: M.I., H.D., A.K.A., and M.G. Data curation: M.I. and H.D. Formal analysis: M.I. and H.D. Funding acquisition: H.D. and M.G. Investigation: M.I., A.K.A., J.G., and M.G. Methodology: M.I. and H.D. Project administration: M.I. Resources: M.I., H.D., A.K.A., J.G., and M.G. Supervision: H.D. and M.G. Validation: M.I. and H.D. Visualization: M.I. and H.D. Writing – original draft: M.I., A.K.A., J.G., and M.G. Writing – review and editing: M.I., H.D., A.K.A., J.G., and M.G. Author contribution was created with the *tenzing* package (Version 0.2.0; Kovacs *et al.*, 2020).

ETHICS APPROVAL STATEMENT

The procedure for the study was approved by the Swedish Ethical Review Authority (2019–05028).

DATA AVAILABILITY STATEMENT

A reproducible version of the manuscript, including the code, and a synthetic data set with properties similar to the original data set can be found at osf.io/vcma5/ (DOI https://doi.org/10.17605/OSF.IO/VCMA5).

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SUPPORTING INFORMATION

Additional supporting information may be found online in the Supporting Information section at the end of the article:

Table S1. A comparison of response options and items in SSF and FIQ. Items that are identical, or practically identical, between the SSF and FIQ are aligned