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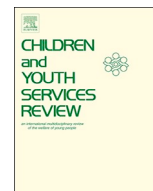
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Risk assessment for foster placement breakdown: The predictive value of the strengths and difficulties questionnaire and foster child and foster family characteristics

F.B. van Rooij*, C. van der Put, A.M. Maaskant¹, D. Folkeringa, J.M.A. Hermanns

Child Development and Education, Faculty of Social and Behavioral Sciences, University of Amsterdam, The Netherlands, PO Box 15780, 1001 NG Amsterdam, The Netherlands

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ABSTRACT

A significant number of long-term foster placements, intended to provide the child with a stable and safe family rearing environment until the age of 18, end unplanned. This study examined the predictive power of the Strength and Difficulties Questionnaire (SDQ) for predicting foster placement breakdown. It was examined whether the predictive value of the SDQ could be improved by developing a risk classification in which the SDQ scales are combined with foster child and foster family characteristics. The present sample consisted of 526 foster children. Foster parents initially filled out a questionnaire (SDQ and foster child and foster family characteristics). After on average 4 years files were analyzed on whether or not the foster placement broke down and the reason for break down. A CHAID-analysis was performed to develop the risk classification. Results showed that both the SDQ total difficulties score as well as the impact supplement have medium to high predictive power for placement breakdown (AUC = 0.75 and 0.70, respectively). A risk classification based on the SDQ total difficulties score, the age the child was placed with the foster family, the presence of other foster children and the SDQ hyperactivity /attention problems score had high predictive power (AUC = 0.82). Both the SDQ and the newly developed risk classification showed to be valuable tools for predicting placement breakdown. Both tools might help foster care organizations to monitor the placement and assist foster families timely to prevent breakdown.

1. Introduction

In 2016, approximately 22.000 children in the Netherlands were living in foster families (Pleegzorg Nederland, 2017; a similar percentage as in institutionalized care, Jeugdzorg Nederland, 2018). Their parents were unable to provide a safe home environment due to, among other things, inadequate parenting skills, abuse and neglect, familial problems (such as parental conflicts or other traumatic events, substance use, or psychiatric problems), and difficulties to handle the behavior of the child (Oswald, Heil, & Goldbeck, 2010; Pleegzorg Nederland, 2017; Rubin, O'Reilly, Luan, & Localio, 2007; Vanderfaeillie, Damen, Pijnenburg, Van den Bergh, & Van Hoven, 2016). The children were placed in foster families by child protection services, or voluntary by their parent(s). Foster placements in the Netherlands can be either short-term or long-term. The aim of short-term placements (less than a year) is to reunite foster children with

their families as soon as possible through improving the parenting situation of the biological parents. Long-term placements, on the other hand, are intended to provide the child with a stable and safe family rearing environment until the age of 18 (Strijker, Knorth, & Knot-Dickscheit, 2008).

In reality, long-term placements, however, tend to be less long-term than the name might suggest. First, it might take a while before there is an agreement of all those involved to classify the placement as long-term. Second, reunification might be considered at a later stage (Goemans, Vanderfaeillie, Damen, Pijnenburg, & Van Hoven, 2016). Moreover, a considerable number of placements end unexpectedly; the placement termination is not according to plan and the foster child is in need of another placement with a new foster family or in an institution (also called breakdown). Through recent years Dutch studies show proportions of breakdown of foster placements between 22% and 50% (Strijker et al., 2008; Van der Ploeg, 1993; Van Rooij, Maaskant,

* Corresponding author.

E-mail address: f.b.vanrooij@uva.nl (F.B. van Rooij).

¹ Present address: GGZ Eindhoven, Postbus 909, 5600 AX Eindhoven, The Netherlands.

Weijers, Weijers, & Hermanns, 2015). These proportions are in line with international findings within foster care (e.g., Minty, 1999; Rubin et al., 2007; Vanderfaeillie, Van Holen, Carlier, & Franssen, 2018; Vinnerljung, Sallnäs, & Berlin, 2014).

The breakdown of placements has consequences for all people involved: foster children, foster families, child welfare organization and the biological families. Foster children who move from a familiar place to a new home or institution, may lose intimate bonds and relations, have to form new bonds and relations, and need to get used to a new living and school environment. This can be taxing and may lead to additional problems (Strijker et al., 2008), and may cause an increase of the risk of consecutive placement breakdowns (e.g., Oosterman, Schuengel, Slot, Bullens, & Doreleijers, 2007). Foster families may experience stress and feelings of loss after foster placement breakdown (Taylor & McQuillan, 2014). They may also experience a sense of failure for not being able to cope with the child, which may result in the decision to stop fostering children altogether (López López, del Valle, Montserrat, & Bravo, 2011; Strijker et al., 2008). Additionally, foster placement breakdown is also considered to burden the child welfare system: foster care providers will have to invest time and monetary funds to look for a new placement for the foster child and assist the child and his new foster parents (Strijker et al., 2008; Taylor & McQuillan, 2014).

Since placement breakdown has adverse effects on all people involved, it is important to identify reasons of breakdown, associated factors and proper instruments to measure both, as this might assist in the allocation of services to prevent placement breakdown (Fisher, Stoolmiller, Mannering, Takahashi, & Chamberlain, 2011; Strijker et al., 2008; Van der Faeillie, Van Holen, Trogh, & Andries, 2012). Previous studies identified difficult behavior of the foster child as the strongest single predictor of placement breakdown, compared to a number of other foster child related (e.g., older age at placement, history of abuse, history of institutional care, higher number of previous placements, shorter length of stay) and foster family related (e.g., the presence of biological children of foster parents, high quality of caregiving, non-kinship care) predictors (Konijn et al., 2019; Oosterman et al., 2007; Rock, Michelson, Thomson, & Day, 2013; Van Rooij et al., 2015).

Behavioral problems among foster children are very common (Burns et al., 2004; Goemans, van Geel, van Beem, & Vedder, 2016; Goemans, van Geel, & Vedder, 2016; Van Rooij et al., 2015). A meta-analysis found that foster children have lower levels of cognitive and adaptive functioning and higher levels of total and externalizing behavior problems than children in the general population (Goemans et al., 2016). Contrary to the general expectation that providing children with a safe foster family environment may benefit the development of the foster children and result in less behavioral problems, recent meta-analyses showed that this is not the case. A meta-analysis comparing children in the child welfare system who were placed in foster families with children in the welfare system who remained with their biological parents showed similar elevated levels of behavioral problems in both groups (Goemans et al., 2016). Also, three decades of longitudinal studies on the development of foster children did not find improvements (nor deteriorations) on group level regarding adaptive functioning, internalizing problems, externalizing problems and total problem behavior (Goemans, van Geel, & Vedder, 2015). Studies focusing on case level instead of group level showed that the problem behavior of most children remained stable (in about two third of the cases), in about one in eight cases the problem behavior improved, whereas in about one in four cases the problem behavior deteriorated (Van Oijen, 2010; Vanderfaeillie, Van Holen, Van Schoonlandt, Robberechts, & Stroobants, 2013).

Regularly screening and monitoring with reliable instruments focusing on the most important risk factor, i.e. child behavior, might assist foster organizations to intervene timely when various risk factors for placement breakdown are present. Although various instruments on

child behavior have been used in studies focusing on understanding the relationship between behavior problems and placement stability (e.g., for Child Behavior Checklist (CBC; Barber, Delfabbro, & Cooper, 2001), see Strijker et al., 2008 and Van Rooij et al., 2015, for Child Behavior Check List (CBCL; Achenbach, 1991), see Newton, Litrownik, & Landsverk, 2000), few studies have specifically focused on the abilities of instruments on child behavior to predict foster care placement breakdown. The studies that did, focused on the Parent Daily Report Checklist (PDR; Chamberlain & Reid, 1987; Chamberlain et al., 2006), the Brief Assessment Checklist (BAC, child or adolescent version; Tarren-Sweeney, 2013), and the Strength and Difficulties Questionnaire (SDQ; Goodman & Goodman, 2009).

The PDR focuses on problematic child behavior in the past 24 h (e.g., aggressiveness, arguing, lying) and exists of 30 items (with good internal reliability) which are assessed by telephone interviews on multiple successive days. Several studies showed that the PDR turned out to be a useful instrument to predict foster placement breakdown in the successive year (Chamberlain et al., 2006; Fisher et al., 2011; Hurlburt, Chamberlain, DeGarmo, Zhang, & Price, 2010). Cut-off points for children with high risk versus low risk were found to be 5 incidents of problem behavior of foster children a day (Fisher et al., 2011) or 6 (Chamberlain et al., 2006; Hurlburt et al., 2010). Each additional incident above these threshold was found to linearly increase the risk for foster placements breakdown (Chamberlain et al., 2006; Fisher et al., 2011). Although the PDR offers clear cut-off points and is easy to interpret, the three 5-min telephone interviews might not always be feasible.

The BAC (an abbreviated version of the Assessment Checklist for Children and for Adolescents, Tarren-Sweeney, 2007, 2013) is a 20 itemed instrument developed to screen children within care systems on mental health difficulties, including trauma- and attachment related difficulties. The BAC showed good psychometric properties to screen and monitor mental health problems in foster children (among other child welfare populations) (Goemans, Tarren-Sweeney, van Geel, & Vedder, 2018; Tarren-Sweeney, 2013). Goemans and colleagues assessed the possible use of the BAC to screen for placements breakdown, whereby the risk for placement breakdown was operationalized as the intention of foster parents to quit with the foster care placement (Goemans, Tarren-Sweeney, et al., 2018). The BAC showed sufficient predictive power for the intention to quit foster parenting a foster child. The BAC is not yet widely implemented in the Netherlands and no studies have been conducted regarding the predictive power of actual breakdown.

As a measure of concurrent validity to the BAC, Goemans, Tarren-Sweeney and colleagues (2018) also assessed the predictive power of the total difficulty scores of the SDQ parent form on the intention of foster parents to end the placement. The SDQ parent form is widely implemented in Dutch youth care as well as in regular behavioral screenings within youth- and school health care (Municipal Health Care Netherlands. (GGD), 2006). The SDQ consists of 25 items measuring behavior and a five itemed impact supplement measuring the distress and social impairment for the whole family that is caused by the negative behavior. Of the 25 items measuring child behavior, twenty items describe negative attributes of children and adolescents that can be allocated to four subscales of five items each (emotional symptoms, conduct problems, hyperactivity/inattention, peer problems). The remaining five items of the SDQ describe positive attributes measuring prosocial behavior. Based on the four problem behavior subscales a total difficulties score can be calculated. Goemans, Tarren-Sweeney and colleagues (2018) found similar predictive power of the SDQ total difficulties scores to the BAC for predicting the intention to quit the placement (both sufficient predictive power). Nevertheless, they did not include the different subscales and the impact supplement in their analysis, nor did they determine cut-off points. Also the predictive power might be different when looking at actual breakdown instead of intentions.

1.1. Research questions

In the current article we focused on the predictive power of the SDQ parent form on actual placement breakdown (unplanned ending of placements other than replacement with biological parents) among a sample of primary school-aged (4–12) foster children in long-term foster care. Different from the previous study on the BAC and SDQ (Goemans et al., 2018), we used actual breakdown as an outcome measure instead of intentions of foster parents to end the placement, using a prospective longitudinal design. Secondly, besides looking at the predictive power of the total difficulties score of the SDQ for breakdown, we also included the SDQ subscales (to look for risks of specific types of problems) and the SDQ impact supplement in our analysis (to see if the burden of the child-problems for the foster family increased the risk). Moreover, we assessed to what extent the predictive value of the SDQ could be improved by developing a risk classification, based on a CHAID-analysis (Steadman et al., 2000; Thomas & Leese, 2003), in which the SDQ scales are combined with foster child and family characteristics that are already easily available to foster organizations. More concrete, we answered the following research questions:

1. What is the strength of the associations between breakdown and the SDQ total difficulties score, the SDQ subscales, SDQ impact score, foster child characteristics and foster family characteristics?
2. What is the predictive validity of the SDQ (total difficulties score and impact score) in predicting breakdown?
3. To what extent can the predictive value of the SDQ be improved by developing a risk classification in which the SDQ scales (both total difficulties score and subscale scores) are combined with foster child and family characteristics?

2. Methods

2.1. Recruitment and procedure

Ethical approval for this study was obtained from the Ethical Committee of the Faculty of Social and Behavioral Sciences of the University of Amsterdam, as well as from the boards of the three participating Dutch regional foster care organizations.

To assess the behavior and socio-demographic backgrounds of the foster children, we used data on foster families that had been screened for participation in a randomized controlled trial (RCT) that was aimed at foster parents who reported high levels of problem behavior with their foster child (see Maaskant et al., 2017). Foster parents were invited to fill out a questionnaire for the screening in case they met the following requirements: foster child was between 4 and 12 years old and placement was long term (according to the classification of the foster care organization at the moment of the start of the study). In case of foster families with two foster parents both foster parents were encouraged to both fill out the questionnaire and do this separately (henceforth, foster parent one refers to mostly foster mothers and foster parent two to mostly foster fathers, as we also included same-sex foster parents). The foster parents were invited to participate in the screening (2011–2013) regardless of the level of behavioral problems with their foster children (see also Maaskant, van Rooij & Hermans, 2014, and Maaskant et al., 2017 for an extensive description of this data collection). For the current study the screening data from both the foster families that took part in the RCT and the foster parents that did not take part in the RCT are included, as no effect of the intervention on the problem behavior of the child compared to care as usual was found (see Maaskant, van Rooij, Overbeek, Oort & Hermans, 2016). All foster care organizations participating in the previous RCT study agreed to participating in the current study.

To assess breakdown (placement of the foster child in another foster family or a residential setting), information (foster child still in same

placement?, date of breakdown, described reasons for breakdown) was collected from the files of the foster organization at the end of 2016. Researchers collecting this data, received a list with a research identification number and name and date of birth of the foster child, after signing a confidentiality agreement with the participating institutions. After data collection, the lists with names were erased. The file (containing research id and information regarding placement breakdown) was subsequently merged by another researcher with the screening data (based on the identification number). Two researchers independently categorized the reasons of cases where foster children were not living with the foster family anymore into: reunification with biological parent(s), no reason mentioned in files, reasons other than reunification with biological parents. The categorizations of the researchers corresponded.

2.2. Instruments

2.2.1. Screening

2.2.1.1. Behavior. We used the Dutch version of the parent form of the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997; Muris, Meesters, & van den Berg, 2003; Van Widenfelt, Goedhart, Treffers, & Goodman, 2003) to screen for mental health problems. The SDQ parent form consists of 25 items; 20 items describing problem behavior (subscales emotional symptoms, conduct problems, hyperactivity/inattention, peer problems; 5 items each), and 5 items describing positive behavior (subscale prosocial behavior). Items are scored on a 3-point Likert scale (0 = “not true”, 1 = “somewhat true”, 2 = “certainly true”). Two examples of items are: ‘My child often lies or cheats’ (conduct problem subscale) and ‘My child is considerate of other people’s feelings’ (prosocial behavior subscale). Subscale scores were computed by summing scores on relevant items (after recoding reversed items; range 0–10 per subscale). The problem behavior subscales together form the total difficulties score (range 0–40). Higher scores on the four problem subscales and the total difficulties score reflect more problems; higher scores on prosocial behavior subscale reflect more positive behavior. The internal reliability of the subscales and total difficulties score for respectively foster parent one and foster parent two were sufficient to good (Cronbach’s Alpha for emotional symptoms: 0.75, 0.72; conduct problems: 0.69, 0.70, hyperactivity/inattention: 0.84, 0.85; peer problems = 0.68, 0.71; prosocial behavior: 0.71, 0.76; total difficulties score: 0.89, 0.90).

The impact of the behavioral problems for the child and the foster family was assessed with the SDQ impact supplement. This supplement consists of items about the severity of the perceived problems and about the duration, distress for child, social impairment for the child, and burden for the family (3-point Likert Scale, 0 = “not at all/only a little”, 1 = “quite a lot”, 2 = “a great deal”). Based on the items regarding distress for the child, social impairment for the child and burden for the family an impact score was calculated (Cronbach’s Alpha = 0.77 for parent one and 0.74 for parent two).

For each subscale, the total difficulties score and the impact score a single score for each case was calculated (called average score). This score consisted of the average scores of both foster parents’ reports in cases where two foster parents filled-out the SDQ and the scores of the cases where one foster parent filled out the questionnaire.

2.2.1.2. Foster child and foster family characteristics. Two types of potential risk factors were measured: foster child characteristics and foster family characteristics. We included foster child and foster family characteristics that are already easily available to foster care organizations and have been found in one or more studies to increase the chance on breakdown (see for instance the studies in Konijn et al., 2019; Oosterman et al., 2007; Rock et al., 2013). The following foster child characteristics were assessed: age of the child at placement, sex of the child, cultural background (Dutch vs non-Dutch as reported by the foster parents), number of former placements, and duration of the

placement. Foster family characteristics that were measured were: age of foster parents, kinship/ non-kinship foster family, type of child custody (under supervision (a child protection service shares parental authority with the parent(s), but can use a number of mandates to surpass the parents authority), voluntary, parental authority terminated (the parental authority is transferred to child protection services or a natural person)), foster parents have custody, match cultural background with at least one foster parent, other foster children in the family, foster parents' own children in the family. Additionally, we included two foster family characteristics that are found to be a risk factor in general in families: family type (single, men-women, women-women/men-men, other) and educational level of the foster parents (highest education obtained by foster parent).

2.2.2. File data

2.2.2.1. Breakdown. Based on the files of the foster care organizations foster children were firstly categorized in whether or not they were still living with the same foster family as at the time of the screening. Of those who were not living with the foster family anymore, the date and reason of termination were reported. These reasons were subsequently categorized into: reunification with biological parent(s), no reason mentioned in files, reasons other than replacement with biological parents. The latter two were coded as breakdown.

2.2.3. Time between assessments

Time between assessments was calculated for each case based on the difference between the dates of the screening questionnaire and file analysis.

2.3. Participants

In total 797 foster parents filled out screening questionnaires about 526 foster children. The questionnaires about seventeen children were omitted from further analyses as they were replaced with their biological family, resulting in a total number of 509 foster children for this study. At the time of the questionnaire children were on average 7.64 years old (*SD* = 2.38). See Table 1 for an overview of the demographic background characteristics of the 509 foster children and the foster families they stayed with during the screenings period. The average time between the screening questionnaire and the file analyses was 4.31 years (*SD* = 1.08).

2.4. Analyses

First, point-biserial correlations (r_{pb}) were calculated to examine the strength of the associations between breakdown and the SDQ subscales,

SDQ total difficulties score, and SDQ impact score, both for the first foster parent (mostly the mother), the second foster parent (mostly the father) and the average score of the foster parents. In addition, point-biserial correlations (r_{pb}) for the variables measured on interval level, and chi-square tests for the variables measures on nominal or ordinal level, were calculated to examine the strength of the associations between breakdown and foster child and foster family characteristics.

Second, the predictive validity of the SDQ total difficulties score and the SDQ impact score were assessed by calculating the area under the receiver operating characteristic curve (AUC) value. The AUC value indicates the probability that a randomly selected foster family, in which there will be breakdown, has a higher risk classification than a randomly selected foster family in which there will be no breakdown (Hanley & McNeil, 1982). An AUC value of 0.50 indicates that the instrument performs no better than chance. A value of 1.00 indicates a perfect positive prediction, a value of 0.00 a perfect negative prediction. AUC values of 0.64 and higher correspond with a medium effect size ($d = 0.50$) and AUC values of 0.71 and higher correspond with a large effect size ($d = 0.80$; Rice & Harris, 2005).

To examine whether the predictive value of the SDQ can be improved by combining it with foster child and family characteristics, a risk classification was developed by means of a chi-squared automatic interaction detector (CHAID) analysis. CHAID is a decision tree classification method that groups cases into subsets of cases with different levels of risk of a specific outcome on the basis of particular combinations of variables (Steadman et al., 2000; Thomas & Leese, 2003). This method focuses on interactions between variables rather than on main effects of variables in the dataset being examined. The SDQ subscales, SDQ total difficulties scores, SDQ impact score, foster child and foster family characteristics that were significantly associated with breakdown were included as input for the CHAID analysis (see Table 2 and Table 3).

The CHAID algorithm involves dividing the total group of subjects into a number of subgroups on the basis of the independent variables most strongly associated with a specific outcome (in this study, breakdown). In the first step of the CHAID procedure, the total group of subjects was divided into a number of subgroups on the basis of the variable most strongly associated with breakdown. In the second step, the groups were split again on the basis of the variable that was then most strongly associated with breakdown. This procedure was repeated until no variables remained that had a significant association with breakdown in the subgroups, or until the groups had reached a minimum size ($n = 20$ in the present study). In a CHAID analysis, the optimal cut-off points of predicting variables are determined by maximizing differences between (sub)groups and minimizing differences within (sub)groups given the dependent variable (in this case the risk of

Table 1
Foster child and foster family characteristics (N = 509).

	M (SD)	Range	n (%)
Characteristics of foster child			
Age of the child at placement (years) ($n = 488$)	3.34 (2.96)	0.00–11.08	
Sex of the child (boy)			242 (48%)
Cultural background of the child (Dutch)			341 (67%)
Number of former placements	1.00 (1.08)	0–6	
Duration of the placement (years)	4.30 (2.83)	0.05–11.52	
Characteristics of foster family			
Type of family single men-women women-women/men-men other missing			51 (10%) 405 (80%) 28 (6%) 10 (2%) 15 (3%)
Age foster parent one (in most cases the foster mother)	47.92 (8.79)	28.12–76.90	
Age foster parent two (in most cases the foster father)	49.92 (9.25)	22.68–77.34	
One or more foster parents finished primary school missing			471 (93%) 22 (4%)
Kinship foster family missing			175 (34%) 1 (0%)
Type of child custody under supervision voluntary parental authority terminated missing			213 (42%) 57 (12%) 238 (47%) 1 (0%)
Foster parents have custody missing			57 (11%) 1(0%)
Match cultural background child and one or more foster parents missing			359 (71%) 3 (1%)
Other foster children in the foster family home			263 (52%)
Parents own children in the foster family home			217 (43%)

Table 2
Point-biserial correlations (r_{pb}) between breakdown and SDQ scales (N = 509).

	Foster parent one (in most cases the foster mother)	Foster parent two (in most cases the foster father)	Average score foster parents
Emotional symptoms	0.16***	0.16**	0.15**
Conduct problems	0.23***	0.24***	0.25***
Hyperactivity/inattention	0.24***	0.24***	0.25***
Peer relationship problems	0.26***	0.18**	0.25***
Prosocial behavior	-0.16***	-0.14*	-0.16***
Total difficulties score	0.30***	0.26***	0.29***
Impact score	0.30***	0.24***	0.27***

* $p < .05$.
** $p < .01$.
*** $p < .001$.

Table 3
Point-biserial correlations (r_{pb}) between breakdown and characteristics of foster family and foster child (N = 509).

	r_{pb}	$\chi^2(df)$
Characteristics of foster child		
Age of the child at placement	0.24***	
Sex of the child		0.16(1)
Cultural background of the child (Dutch / non-Dutch)		0.02(1)
Number of former placements	0.10*	
Duration of the placement	-0.15**	
Characteristics of foster family		
Type of family (single, men-women, women-women/men-men, other)		0.21(3)
Age foster parent one (in most cases the foster mother)	0.01	
Age foster parent two (in most cases the foster father)	-0.02	
Highest education foster parents		0.21(3)
Kinship/non-kinship foster family		0.22(1)
Type of child custody (under supervision, voluntary, parental authority terminated)		3.73(2)
Foster parents have custody (no,yes)		0.71(1)
Match cultural background child and foster parents (no, yes)		0.01(1)
Other foster children in the family (no, yes)		4.75(1)*
Foster parents' biological children in the family (no, yes)		1.57(1)

* $p < .05$.
*** $p < .001$.

future breakdown). CHAID is highly appropriate for gaining insight into family profiles with a high or a low risk, because it identifies groups of cases that share the same risk factors and thus the same risk of a specific outcome (Steadman et al., 2000; Thomas & Leese, 2003). Another advantage of CHAID is that the results are presented graphically (see Fig. 1) and are therefore easy to interpret. To cross-validate the risk classification, we used the k -fold cross-validation method, choosing $k = 10$. This means that the original sample was randomly partitioned into 10 equally sized subsamples (folds) to validate the risk classification. Ten iterations of training and validation were subsequently performed such that within each iteration a different fold of the data was held out for validation, while the remaining nine folds were used for learning (Steadman et al., 2000; Thomas & Leese, 2003).

The method of Hanley and McNeil (1982) was used to test whether the AUC values of the SDQ total difficulties score and the risk classification differed significantly.

3. Results

3.1. Relation between breakdown and SDQ subscales, foster child characteristics and foster family characteristics

The overall breakdown rate was 12.2% ($n = 62$). Table 2 shows the point-biserial correlations (r_{pb}) between breakdown and the SDQ subscales, SDQ total difficulties score, SDQ impact score (both for foster parent one, foster parent two and the average score of both foster

parents). Table 3 shows the point-biserial correlations (r_{pb}) between breakdown and the foster child/foster family characteristics for the variables measured on interval level and chi-square tests (χ^2) between breakdown and foster child/foster family characteristics for variables measured on ordinal or nominal level. The r_{pb} values for small, medium and large effect sizes for a 12.2% base rate are 0.065, 0.161 and 0.253 respectively, calculated with conversion formulae (after Rosenthal, 1991; Swets, 1986) provided by Rice and Harris (2005).

All SDQ subscales were related to breakdown: emotional symptoms (small effect), conduct problems (medium effect), hyperactivity/inattention (medium effect), peer relationship problems (large effect for foster parent one and medium effect for foster parent two and the average score of foster parents), and prosocial behavior (the more prosocial behavior, the lower the breakdown rate; medium effect for foster parent one and small effect for foster parent two and the average score of foster parents). In addition, the total SDQ difficulties score and the SDQ impact score were related to breakdown (large effects, with the exception of a medium effect for impact for the second foster parent).

Most characteristics of foster family and foster child were not significantly related to breakdown, with the exception of other foster children in the family (more breakdown among families with no other foster children), age of the child at placement (the older the child, the higher the rate of breakdown; medium effect), number of former placements of the child (the more placements, the higher the rate of breakdown; small effect) and duration of the placement (the longer the duration, the lower the rate of breakdown; small effect).

3.2. The development of a risk classification

A CHAID analysis was performed to develop a risk classification. The individual items significantly associated with breakdown were included as independent variables (see Table 2 and Table 3). For the SDQ scales, only the average scores of the foster parents were included. Fig. 1 presents the output of the CHAID analysis (decision tree). The risk classification (average risk of breakdown $p = .112$) was based on a combination of four variables that proved to be the strongest predictors of breakdown and made a unique contribution to the prediction of breakdown: (1) SDQ total difficulties score (average score foster parents), (2) age of the foster child by start of the placement, (3) SDQ hyperactivity score (average score of foster parents), and (4) other foster children in the family. The separate SDQ subscales emotional symptoms, conduct problems, peer relationship problems, prosocial behavior, the SDQ impact score, the number of former placements, duration of the placement and foster parents own children in the family did not have a unique contribution to the prediction of breakdown, above the other predictors, and were not further included in discerning risk groups.

First, the total group of children was divided into three subgroups based on SDQ total difficulties score. If the SDQ total difficulties score was less than 9.5 (40.1% of the sample), the risk was lowest (proportion of breakdown $p = .025$), and if the SDQ total difficulties score was more

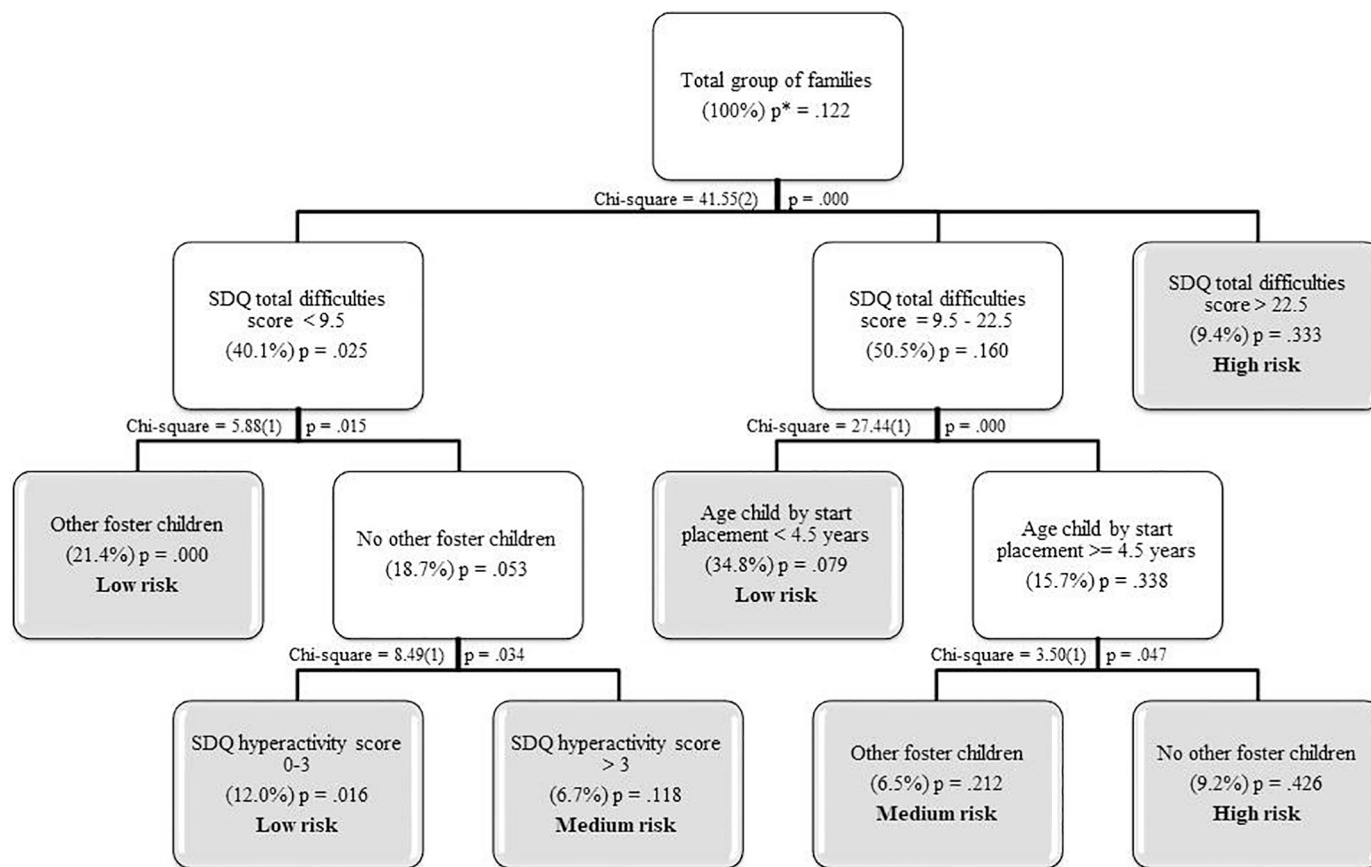


Fig. 1. CHAID output.

Notes. *p = proportion of breakdown. The grey shaded terminal nodes represent the ‘risk groups’ in which cases have similar scores on the variables and thus a similar risk of breakdown.

Table 4
Risk classification CHAID analysis (N = 509).

		%	P
1	SDQ total difficulties score is between 9.5 and 22.5, the child was 4.5 years or older by start of placement and there are no other foster children in the family	9.2%	0.43
2	SDQ total difficulties score is higher than 22.5	9.4%	0.33
3	SDQ total difficulties score is between 9.5 and 22.5, the child was 4.5 years or older by start of placement and there are other foster children in the family	6.5%	0.21
4	SDQ total score is lower than 9.5, there are no other foster children in the family and the SDQ hyperactivity score is higher than 3	6.7%	0.12
5	SDQ total difficulties score is between 9.5 and 22.5, the child was younger than 4.5 years by start of placement	34.8%	0.08
6	SDQ total score is lower than 9.5, there are no other foster children in the family and the SDQ hyperactivity score is between 0 and 3	12.0%	0.02
7	SDQ total score is lower than 9.5, there are other foster children in the family	21.4%	0.00

Notes. % = the size of the risk group as a percentage of the total sample (n = 3963), P is the probability of breakdown in the risk groups.

than 22.5 (9.0% of the sample) the risk was highest (proportion of breakdown $p = .333$). Next, the subgroups were split again (and again for some subgroups) based on the variables that were then most strongly related to breakdown. This resulted in seven different risk groups with a risk ranging from 0.00 to 0.426 (see Table 4). These groups can be further grouped into high risk groups (group 1 and 2) with a breakdown risk of 0.43 and 0.33, respectively, two medium risk groups (group 3 and 4) with a breakdown risk of 0.21 and 0.12, respectively and three low risk groups (group 5–7) with a breakdown risk of 0.08 or less.

3.3. Predictive validity of the SDQ total difficulties score, the SDQ impact score and the risk classification

Table 5 shows the AUC values predicting breakdown for (a) the SDQ total difficulties score, (b) the SDQ impact score and (c) the risk classification. The AUC value of the SDQ total difficulties score was 0.75

Table 5
AUC values of (a) the SDQ total difficulties score, (b) the SDQ impact score and (c) the risk classification (N = 509).

	AUC (95% C.I.)
SDQ total difficulties score	0.75 (0.69–0.81)
SDQ impact score	0.70 (0.62–0.77)
Risk classification	0.82 (0.77–0.87)

(0.69–0.81), the AUC value of the SDQ impact score was 0.70 (0.66–0.77) and the AUC value of the risk classification was 0.82 (0.77–0.87).

The AUC value of the risk classification was significantly higher than the AUC value of the SDQ impact score ($z = 2.44, p < .015$), but not significantly higher than the AUC value of the SDQ total difficulties score ($z = 1.40, p < .161$). There was no significant difference

between the AUC value of the SDQ impact score and the AUC value of the SDQ total difficulties score ($z = 1.02, p = .306$).

4. Discussion

In this study we focused on the predictive validity of the SDQ in relation to the actual breakdown of long-term foster care placements in an average time window of four years of foster children aged 4 to 12. We also focused on the contribution of foster child and foster family characteristics in addition to the SDQ to predict breakdown by developing a risk classification. In order to do so, we first studied the strength of associations between breakdown of the foster placements and the SDQ, foster child and foster family characteristics. After this, we looked at and compared the predictive power of the SDQ total difficulties score, SDQ impact score and a risk classification based on the SDQ total difficulties score, subscales, impact score and the foster child and foster family characteristics that were significantly related to breakdown of the foster placements in the univariate analyses.

In this study one in eight of all foster children living in long-term fostering arrangements faced a breakdown of the current placement. This number is substantially lower than reported in other (Dutch and international) studies (Minty, 1999; Vanderfaeillie et al., 2018; Van Rooij et al., 2015). This lower number might be the result of selecting existing foster placements with a long-term perspective regardless of the time already spend within this foster family. A number of studies found that the chance of breakdown is highest in the months following the placement, e.g.: highest chance during the first 18 months according to the study by Vanderfaeillie, Goemans, Damen, Van Holen, and Pijnenburg (2018) and during the first 6 months according to the study by Wulczyn, Kogan, and Harden (2003). Within our study, at the moment of assessment with the SDQ only 22% of the foster children were with the foster family for less than 18 months. This might have led to the lower percentage of breakdown within our study. This is also supported by the finding in this study that length of stay was negatively correlated to breakdown.

We found that all the SDQ subscales, as well as the total difficulties scale and the impact scale were significantly related to breakdown. Besides the SDQ variables, the following foster child and foster family characteristics were related (univariate) to a higher breakdown rate: older age at placement in the foster family, more previous placements, shorter placement duration with the foster family, and no other foster children in the foster family. The predictive validity of the SDQ total difficulties score and impact score proved to be respectively good, with AUC 0.75, and sufficient, with AUC 0.70. When combining the SDQ total difficulties score, subscale scores, impact score and the univariate significantly related foster child and foster family characteristics in a risk classification, a combination of four variables proved to be the strongest predictors and made a unique contribution to predicting breakdown: the SDQ total difficulties score, the SDQ subscale hyperactivity/inattention, age at placement in foster family and whether or not other foster children were present in the foster family. Based on these four factors, seven risk groups with low to high breakdown probabilities were distinguished. Children with SDQ total difficulties scores ranging from the top of the normal range to high clinical scores (see for norm scores Goedhart, Treffers, & Van Widenfelt, 2003), placed after they were 4.5 years old in families without other foster children and children with very high clinical SDQ total difficulties scores had the highest risk for breakdown of their foster placement. This risk classification had a good predictive power: the AUC value of the risk classification predicting breakdown was (0.82) and was significantly higher than the AUC value of the SDQ impact score, but not significantly higher than the AUC value of the SDQ total difficulties score.

In comparison with previous studies, the AUC values of the SDQ (specifically the total difficulties score) correspond with a large effect size, while the AUC values of the PDR (Chamberlain et al., 2006: AUC = 0.66 for breakdown) and the BAC (see Goemans, Tarren-

Sweeney, et al., 2018: AUC = 0.60 for child version for intention to quit as a proxy for breakdown) correspond with a medium effect size (Rice & Harris, 2005). Also, the effect sizes corresponding with the predictive validity of the SDQ total difficulties score appear to be stronger for actual breakdown (large effect this study), than for foster parent's intention to quit (see Goemans, Tarren-Sweeney, et al., 2018: AUC = 0.61 for children and AUC = 0.67 for adolescents; moderate effect). Therefore, the SDQ seems a favorable instrument: it has a better predictive validity, takes less time than the PDR and contrary to the BAC has been tested with actual breakdown.

The risk classification, where the SDQ total difficulties score was combined with the subscale hyperactivity/inattention score and the characteristics age at placement and no other foster children in the foster family, leads to similar good predictions as the SDQ total difficulties score, and better predictions than the SDQ impact score. Age at the start of the placement in the foster family and whether or not there are other foster children in the foster family (sometimes narrowed to placement without siblings) have been also found related to placement breakdown in several other studies (see the meta-analyses by Konijn et al., 2019, and Oosterman et al., 2007). Contrary to other studies (see Oosterman et al., 2007) the number of previous placements did not have a unique contribution to the risk classification in our study. This might be due to the low percentage of children, who at the time of SDQ assessment, were living with their foster families for less than 18 months. Since the chance for breakdowns is higher in this group (Vanderfaeillie et al., 2018; Wulczyn et al., 2003), one can argue that the number of previous placements in this group is higher as well. It might also be that the unique influence of previous placements on breakdown is less than previously expected: a recent meta-analysis (Konijn et al., 2019) also did not find the number of previous placements as a risk factor for breakdown.

The high predictive value of the SDQ total difficulties score and the high predictive value of the risk classification show that both are valuable instruments for foster care organizations to use in screening and monitoring foster children aged 4 to 12 in long-term foster placement arrangements. Specifically, the distinguished risk groups from the risk classification might guide foster care workers to provide more attention to specific subgroups at risk for placement breakdown, which might be overlooked when only the SDQ is used. For instance, among foster children with a low SDQ total difficulties score placed in families with no other foster children, hyperactivity/inattention problems do increase the risk on a placement breakdown.

It should be noted, however, that despite the high predictive power of the risk classification, even in the highest risk group, more than half of the foster children did not experience a breakdown. Signaling a foster child in the high risk groups, therefore, should be followed by a more in-depth individual analyses of the specific case to see whether or not additional support is necessary in order to prevent breakdown. Discussing (and registering) the outcomes of the risk classification and the following analyses with foster parents should be done carefully in order to avoid self-fulfilling prophecy. Also, care workers should realize that also in the lower risk groups there is still a risk for breakdown.

The road to breakdown is in most cases winding and complicated. Foster families have to deal with a substantial number of complex issues that can be stressful and place the family functioning at risk. Besides issues that can put a strain on families in general such as health problems, divorce, poverty, loss of jobs, inadequate housing and interpersonal problems, foster families can encounter additional potential stressors such as post traumatic distress of the foster child, troublesome relationships with the biological parents and family of the foster child and, of course, behavioral problems of the child (e.g., Farmer, Lipscombe, & Moyers, 2005). A better understanding of these processes and of how risks in each individual foster family system accumulate and might destabilize child-rearing processes and placements might help to be able to offer the foster child and foster families appropriate support, guidance and/or treatment.

5. Limitations

Several remarks are warranted. First, it should be noted that the design of the current study does not shed light on the process behind the found associations (nor the processes that might have led to the elevated problem behavior). In our study we observed a high correlation between SDQ total difficulties score and the SDQ impact scores (which might explain the lack of a unique contribution of the impact score in the risk classification). It could be hypothesized that high clinical problem behavior has a high impact on the whole foster family system (which is also supported by a recent longitudinal study showing the unidirectional relationship between problem behavior of foster children and the parenting stress of foster parents; Goemans, van Geel, & Vedder, 2018), and that this might lead to foster families quitting with the placements. It could, however, also be hypothesized that other or additional problems of the foster family cause problematic parenting and dysfunctional family life and in consequence behavioral and/or psychological problems of the foster child, that was vulnerable from to begin with. Taking care of a difficult to handle foster child on the top of these problems might have been a too heavy additional burden.

Second, based on the current study design we do not know if the predictive value of the SDQ is similar at each stage of the placement. In order to gain this information a design is needed where the foster parents are asked to fill out the SDQ at the start period of the placement and after fixed intervals. Moreover, such a study could be extended to older children as well to gain knowledge of the predictive validity of the SDQ for breakdown among children aged 12 and older.

Third, we were unable to use a fixed time frame between the collection of the SDQ and background data, and the assessment of whether or not the placement broke down. CHAID analyses do not offer the possibility to control for the time between the two measurements. However, the time between the questionnaire and file analysis was included in the CHAID analysis and did not show a significant unique contribution to the prediction above the SDQ scores and the other socio-demographics (age of child at start of placement, other foster children in the family).

Fourth, using the category non-Dutch cultural background is a very broad category and might not do justice to the specifics of a certain cultural background. This might have influenced the findings. Also breakdown can be defined in different ways, which in turn might have influenced the results. In our study we do not discern between the reasons for breakdown. A bigger study might be able to shed more light on the predictive value of the SDQ and the risk classification for specific causes of breakdown.

The last limitation concerns the generalizability of the results. Non-response analyses halfway through the study showed no statistically significant difference in age and gender between the response and the non-response group (see Maaskant et al., 2014). Nevertheless, as only one out of five foster children were with the foster family for less than 18 months at the moment of assessment with the SDQ, this might have led to a lower percentage of breakdown in our study.

In sum, both the SDQ and the newly developed risk classification (SDQ in combination with foster child and foster family characteristics) showed to be valuable tools for monitoring risks of placement breakdown. Both tools might help foster care organizations to monitor the placement and function as an indicator for possible needs for support, guidance and/or treatment of foster parents and foster children to prevent breakdown.

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Declaration of interest

None

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