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Research article

Child protection cases, one size fits all? Cluster analyses of risk and protective factors

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ABSTRACT

Background: To provide effective tailor made case management in Child Protection Services (CPS) a insight is needed into the specific characteristics of the target group. Using the ecological perspective of maltreatment, this study explored poorly known characteristics of the CPS population.

Objective: To distinguish CPS subgroups based on risk and protective factors enables tailor made case management that fits the specific needs of these subgroups.

Participants and setting: We studied 250 Dutch CPS cases of family supervision by court order that had completed the LIRIK and Action Plan checklists in August 2014–March 2015.

Methods: This quantitative study analyzed risk and protective factors for children and parents reported in client files. Subgroups were identified by two-step cluster analyses. Chi-square analyses identified relations between parental risk subgroups and other groups.

Results: Building on the interplay between risk and protective factors on the levels of child, parent and environment, we found five distinct subgroups in the CPS population. The most vulnerable is parents with multiple problems (31%) or socio-economic problems (13%). Parts of both subgroup have limited protective factors. Parents with major life events (16%) or poor parenting (13%) are characterized by single-level problems. One subgroup (28%), the unaccepted, has no parental risk factors registered.

Conclusions: Studying client files can lead to a better understanding of the healthcare needs of the CPS population. To develop and implement more effective case management requires constant dialogue between science, policy, and the experiences of both clients and professional.

1. Introduction

The Dutch Youth Act of 2014 aimed to improve the quality of youth healthcare by promoting empowerment and effectiveness (Ministry of Health, Welfare and Sport, & Ministry of Security and Justice, 2014). Empowerment is important since it is associated with positive mental health (Fitzsimons & Fuller, 2002; Prilleltensky, Nelson, & Peirson, 2001) and is known to reduce and even prevent child maltreatment (Butchart, Harvey, Mian, & Fürniss, 2006; Wright & Masten, 2005). Integrating empowerment in child protection can thus reduce maltreatment and help children cope with its consequences. Child protection workers worldwide are encouraged to integrate empowerment in their case management. The trend is led by Signs of Safety (SoS), a solution-focused approach that integrates risk and protective factors in the work process in order to reduce developmental threats and increase child

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safety (Turnell & Edwards, 1997). However, little is known about the results of this approach as thorough effect studies are lacking (Bartelink, 2010).

Understanding the effectiveness of CPS case management requires an evaluation process such as Program Theory offers (van Yperen & Veerman, 2008). Program Theory aims to answer evaluative questions that help shape and reshape interventions in order to achieve desirable results (Rossi, Lipsey, & Freeman, 2004). It argues that an intervention can fit a target group best if it recognizes the relevant care needs. It requires determining the nature and scope of the target group's problems.

In the Netherlands, families are assigned to the Child Protection Services (CPS) by a court order that is based on proven developmental threats to child safety, such as maltreatment. Little is known about the specific risk and protective factors of Dutch CPS families, probably due to the only partly standardized assessment procedure and limited data collection (van der Meer, 2010). One study argues that the duration of CPS case management relates strongly to problem severity (Stams, Top-van der Eem, Limburg, van Vugt, & van der Laan, 2010). This confirms the assumption of Program Theory that the characteristics of a target groups influence a healthcare process. Unfortunately, Stams et al. (2010) did not thoroughly explore the actual client characteristics of severity. Other international studies are available but their generalizability is limited due to national differences in juvenile laws, and varying research designs and data collection methods (Stoltenborgh, Bakermans-Kranenburg, Alink, & van IJzendoorn, 2014). Although little is known about the CPS population, it is generally understood that a family court order usually occurs in the case of developmental threat.

In CPS cases, developmental threats are commonly characterized by maltreatment, which is generally seen as a multidimensional transactional interplay between a child, its parents and its environment (Belsky, 1993; Bronfenbrenner, 1994; Cicchetti & Olsen, 1990; Hooven, Nurius, Logan-Greene, & Thompson, 2012). Based on Bronfenbrenner's ecological system theory (1994), this ecological perspective differentiates risk and protective factors on three levels. The micro level comprises child characteristics, the meso level parental factors like psychological resources or parenting skills, and the macro level refers to contextual factors like social support, living environment and culture (Belsky, 1984). It is understood that maltreatment occurs when risk factors outweigh protective factors (Bakker, Bakker, van Dijke, & Terpstra, 1998; Belsky, 1993; Cicchetti & Lynch, 1995; Garbarino, 1977; Hooven et al., 2012; Vink, de Wolff, Broerse, & Kamphuis, 2016). This implies that CPS families have complex and severe problems on several interacting levels, resulting in a population that is often referred to as 'vulnerable'.

Shaping the best care for a vulnerable population requires an integrated approach that considers all the problems. The Delta method used in Dutch CPS case management can help professionals to assess situations and support families in defining goals (PI Research & van Montfoort, 2009). However, the diversity of the population makes it unlikely that one single approach can meet all healthcare needs. Therefore, it is interesting to explore the various healthcare needs of the total CPS population and to investigate if and how subgroups with similar needs can be distinguished. Research into the characteristics of the CPS population is necessary to discriminate between potentially different subgroups. The main question of this study is "to what extent can subgroups be distinguished based upon the prevalence of risk and protective factors to enable tailor made case management that fits the subgroups' specific needs?" This is explored with the following sub-questions: what are the most commonly registered risk and protective factors in the CPS population? Can we distinguish representative subgroups or clusters of risk factors? Can we distinguish representative protective factors that can be utilized in a healthcare program? And, finally, is there multi-dimensional interplay between clusters of risks and protective factors?

This study embraced the ecologic perspective of maltreatment and integrated commonly known risk and protective factors from the literature, as described below.

1.1. Risk factors

Risk factors are defined as factors that increase the likelihood of child maltreatment (Vink et al., 2016). Table 1 shows consistent risk factors on three levels according to the literature.

On the micro level, Belsky (1993) recognizes three child risk factors for maltreatment: age, behavior and physical health. Later research is more exact and specifies, for instance, young children (< 5 years) because they depend highly on their parents (Alink et al., 2012). Other research identifies neonatal problems, such as prematurity or low birth weight, that put babies at risk (Bouwmeester-Landweer, 2006; Klein Velderman & Pannebakker, 2008) and also mentions children with behavioral problems or difficult temperament (Afifi & MacMillan, 2011; Carr, 2006; Collishaw et al., 2007; Kim & Cicchetti, 2003; Runyan, Wattam, Ikeda, Hassan, & Ramiro, 2002; Russo, Hambrick, & Owens, 2008) and children from an unwanted pregnancy (Berger, ten Berge, & Geurts, 2004).

Although child-level factors may influence the likelihood of maltreatment, it is generally understood that the largest contributors are parental factors (Alink et al., 2012; Belsky, 1984; Jaffee, Caspi, Moffit, Polo-Thomas, & Price, 2004). Parental factors can be divided into the personal characteristics of a parent and parenting abilities. In terms of personal characteristics, the following factors are known to increase the risk of maltreatment: lower education level (Dubowitz et al., 2011; Gilbert et al., 2009; Sedlak et al., 2010), mental health issues or substance abuse (Berger et al., 2004; Dubowitz & Bennett, 2007; Friedman et al., 2011; Runyan et al., 2002; Zielinski & Bradshaw, 2006), low self-esteem (Dubowitz & Bennett, 2007; Schumacher, Slep, & Heyman, 2001; Stith et al., 2009), financial problems (Cox, Kotch, & Everson, 2003; Friedman et al., 2011; Zielinski & Bradshaw, 2006) and unemployment (Leerdam, Kooijman, Öry, & Landweer, 2003; Sedlak et al., 2010). Finally, parents who have experienced maltreatment in their own childhood are at increased risk of maltreating their own children (Friedman et al., 2011; Runyan et al., 2002).

Focusing on parenting risk factors, poor parenting skills increase the likelihood of maltreatment (Carr, 2006; Hermanns, Öry, & Schrijvers, 2005) and the parents' disappointment due to unrealistic expectations of their children's abilities is often mentioned (Carr,

Table 1
Risk factors.

Level	Factor
Child level	• young age, <5 years • prematurity • low birth weight • disruptive behavior • difficult temperament • child of unwanted pregnancy
Parental level	• low educational level • mental health issues • substance abuse • low self-esteem • financial problems • unemployment • victim of child maltreatment • poor parenting skills • lack of knowledge on child's development pattern • domestic violence • family conflicts • single parenthood • large family size, >3 children • stepfamilies
Environmental level	• low social economic circumstances • areas with poverty • residential instability • social isolation

2006; Li, Godinet, & Arnsberger, 2011; Rosenstein, 1995). Further, the family situation also increases the risk of maltreatment. Examples include domestic violence (Dubowitz & Bennett, 2007; Friedman et al., 2011; Runyan et al., 2002), repeated family conflicts (Friedman et al., 2011; Hermanns et al., 2005; Hindley, Ramchandani, & Jones, 2006), single parenthood, households with three or more children (Dubowitz et al., 2011; Hermanns et al., 2005; Sedlak et al., 2010) and stepfamilies (Alink et al., 2012).

Environmental factors also increase the maltreatment risk, such as living in disadvantaged areas with parents having to cope with stress, unemployment, residential instability and financial disadvantages (Coulton, Crampton, Irwin, Spilsbury, & Korbin, 2007; Holtzer, 2010). Such conditions are also known for their social isolation, which is one of the biggest environmental risk factors for child maltreatment (Carr, 2006; Leerdam et al., 2003).

1.2. Protective factors

Protective factors are the positive abilities of people that both increase the chance of a better outcome, particularly in situations of risk or adversity (Wright & Masten, 2005) and tend to reduce the (re)occurrence of maltreatment (Butchart et al., 2006; Cicchetti & Rizley, 1981; Wright & Masten, 2005). Although little is known about protective factors, several characteristics are consistently

Table 2
Protective factors.

Level	Factor
Child level	• easy temperament • positive coping • social skills • self-esteem • intelligence
Parental level	• self-esteem • internal locus of control • problem understanding • willingness to change • acceptance of care • cooperation with a professional • secure attachment between parent and child • stability within family • parenting with empathy and support for the child • knowledge about the child's development • adequate communication within family
Environmental level	• social support (family & friends) • friendship with peers

mentioned in research (Carr, 2006; Hengartner, Müller, Rodgers, Rössler, & Ajdacic-Gross, 2013; Rooijen, Bartelink, & Berg, 2013; Thoburn, Lewis, & Shemmings, 1995). Table 2 shows an overview of the protective factors found in the literature.

Child protective factors are generally understood to support resilience and thus help children cope with maltreatment (Carr, 2006; Ronan, Canoy, & Burke, 2009; Rooijen et al., 2013; Vink et al., 2016). For instance, some research found that children with an easy temperament are more likely to have a positive coping strategy for difficulties in life and are more likely to build a network for support (Carr, 2006; Chess & Thomas, 1995). Several studies found that intelligence promotes resilience (Barnes & Josefowitz, 2014; Carr, 2006; Haskett, Nears, Ward, & McPherson, 2006; Hengartner et al., 2013; Rooijen et al., 2013) and self-esteem was found to reduce psychosocial stress and gain social connectedness (Barnes & Josefowitz, 2014; Carr, 2006; Cicchetti, 2013; Dang, 2014; Haskett et al., 2006; Moran & Eckenrode, 1992; Rooijen et al., 2013). Social competencies promote resilience and reduce the internalizing of problems (Kim & Cicchetti, 2003; Schultz, Tharp-Taylor, Haviland, & Jaycox, 2009).

Protective factors on the parental level can again be divided into personal characteristics and parenting abilities. Parents with self-esteem and internal locus of control, for instance, are less likely to maintain problematic interaction (Carr, 2006; Rooijen et al., 2013). Problem understanding, willingness to change, acceptance of care, and cooperation are known to promote help-seeking behavior in parents (Carr, 2006; Thoburn et al., 1995). In terms of parenting skills, secure attachment with a child is a protective factor as it is characterized by giving positive feedback and supporting the child while offering structure, stability and consistency in rules (Butchart et al., 2006; Haskett et al., 2006; Heller, Larrieu, D'Imperio, & Boris, 1999; Rooijen et al., 2013). Parents with empathy and knowledge of child development are less likely to be frustrated about a child's abilities (Carr, 2006; Li et al., 2011; Rosenstein, 1995) and parents with a clear understanding of their own developmental pathway are less likely to maltreat their children (Rooijen et al., 2013). Only one parent with sufficient parenting skills is necessary for adequate communication skills and stability (Barnes & Josefowitz, 2014; Carr, 2006; Guterman, Lee, Lee, Waldfogel, & Rathouz, 2009).

Finally, environmental protective factors are mostly known for social support (Alink et al., 2012). Social support increases personal sense of well-being, provides an opportunity to seek advice and reduces symptoms of depression, anxiety and anger in children (Barnes & Josefowitz, 2014; Carr, 2006; Cicchetti, 2013; Folger & Wright, 2013; Stams et al., 2010). A social network can provide protection, because the feeling of being valued can prevent negative core beliefs about oneself and promotes healthier adjustment (Carr, 2006; Hyman, Gold, & Cott, 2003; Li et al., 2011; Rooijen et al., 2013; Runtz & Schallow, 1997; Tremblay, Hébert, & Piché, 1999). Parents and children with social support tend to cope better in stressful situations (Coulton et al., 2007) and socially supported children benefit more from treatment (Browne & Winkelman, 2007). In addition, friendship with peers can improve attachment and create a positive self-image which increases resilience to maltreatment (Barnes & Josefowitz, 2014; Cicchetti, 2013; Stams et al., 2010).

We used all the above-mentioned risk and protective factors noted by CPS case managers in client files while collecting data for this study.

2. Methods

2.1. Research design

We conducted a quantitative study based on client files. Our study is part of a larger evaluation of a SoS approach that encourages the Dutch CPS to use protective factors. The CPS was authorized to use file information anonymously for policy development and research as described by the Dutch Privacy Law (2004). In addition, the Medical Ethics Committee of Erasmus University Medical Center tested the research protocol and approved all parts of the research procedure (MEC-2-14-020).

2.2. Research setting

The study took place in one CPS in the Netherlands. A CPS is an organization that executes juvenile court-ordered family supervision for children aged 0–18 years (Central Bureau of Statistics, 2015; Ministry of Security & Justice, 2014). The intervention lasts one year, with possible extensions of one year at a time. Supervision occurs when a general youth care worker, teacher or other concerned citizen suspects developmental threat due to parental inadequacy or maltreatment (Ministry of Security & Justice, 2015). Their concerns go to the Child Care and Protection Board (CCPB) who assesses the need for conviction. In cases with confirmed developmental threat, a juvenile court judge may rule for a sanction, such as a court-ordered family supervision either with or without custodial placement, and exemption or removal of parental authority (Ministry of Security & Justice, 2014). The current study included cases of family supervision. The cases are managed by a CPS child protection worker who coordinates and refers health care for both caregivers and children in order to resolve developmental threats and increase child safety.

2.3. Participants

The CPS involved in this study managed a total of 1543 cases of court-ordered family supervision in the period 2014–2015. Our study included all new family supervision cases registered between August 2014 and March 2015 for which the case managers filled out a standard risk assessment of child safety, LIRIK (in Dutch: *Licht Instrument Risicotaxatie Kindveiligheid*) and an Action Plan ($n = 250$). The average age of the children was 8.5 ($SD = 5.7$) years and 53% were male. Nearly all children were born in the Netherlands (94%), 83.1% had Dutch nationality and 15.6% more than one nationality. Most lived in co-parenting families, (34.9%), 29.8% lived with one biological parent, 15.6% with both biological parents and 7.8% in a foster home. Large family size (three or more children) occurred in 30.7% cases.

2.4. Data collection procedure

This study collected data from digital and paper client files administered by professionals. Clients were briefed by letter and child protection workers received an e-mail with information on the research and its regulations.

All case files contained demographic information, the LIRIK risk assessment instrument and the Action Plan. We collected the demographic variables of age and gender from the digital client files. After the LIRIK risk assessment was filled out on paper by the case managers, four researchers entered the data in the SPSS software package. The Action Plan was consulted digitally. Two researchers collected information using a checklist of protective and risk factors based on the literature review. The checklist data was also entered into SPSS and checked for insertion error by the two other researchers.

2.5. Measures

Risk and protective factors were measured with the LIRIK check list and the Action Plan assessment report.

2.6. LIRIK

LIRIK is a systematic checklist developed by the Nederlands Jeugdinstituut (Netherlands Youth Institute) that helps Dutch child protection workers evaluate current child safety by registering the risk and protective factors for child maltreatment that are present at a given point in time (Bartelink, de Kwaadsteniet, ten Berge, Witteman, & van Gastel, 2015). The checklist can be filled out on several occasions during case management. This study used the checklist completed during the assessment stage (the first 6 weeks) of the CPS intervention. Both original (2009) and revised (2014) versions were used and the results were equalized between the two versions (available on request). The LIRIK categorizes risk and protective factors on three levels: child (six risk and seven protective items), parent (13 risk and nine protective factors), and family/environmental items (eight risk factors and two protective factors). Validity studies note that professionals find the LIRIK helpful because it provides an overview of all risk and protective factors (Bartelink, 2018; Faber, 2012; ten Berge, van R, & ossum, 2009).

2.7. Action plan

The Action Plan is a standardized written assessment report, used for all CPS cases in the Netherlands. It describes the current family situation in terms of suspicions of unsafety or developmental threats, risk and protective factors, and future goals. A child protection worker writes an Action Plan report together with the family in the first 6 weeks of intervention (the Action Plan is available on request).

We extracted data from the Action Plan with our checklist of risk and protective factors based on the literature review (see Introduction). The checklist was tested in 50 pilot cases. During the pilot phase, we found additional relevant variables and this resulted in a final checklist of 63 factors. Two researchers applied the checklist while observing all 250 cases. Inter-rater reliability was tested on 30 cases and showed substantial reliability with a Cohen's kappa coefficient of 0.64 (Lantz & Nebenzahl, 1996). Next, data reduction took place by merging factors with overlapping content and/or low frequencies. For instance, ADHD, conduct disorders and aggressive behavior were recoded into externalizing characteristics (a full overview of the data reduction is available on request). Finally, overlap with the LIRIK was checked and any duplications were removed. This led to a list of seven child risk factors, two parental risk factors and no risk environmental factors. It also included five protective child factors, three parental protective factors and five environmental protective factors.

2.8. Statistical analyses

Quantitative data analyses were performed using SPSS 24.0 (SPSS Inc., Chicago, IL). First, descriptive statistics and frequency distributions were conducted identify the risk and protective factors. Variables with a frequency of 25 or less were excluded from further analyses because they represent less than 10% of the sample (see Appendices A and B). Multicollinearity was ruled out using correlations between all variables (table is available on request).

Second, we used cluster analysis to find homogenous subgroups of risk and protective variables (Clatworthy, Buick, Hankins, Weinman, & Horne, 2005). Our sample contains categorical variables and therefore, two-step cluster analysis is best to identify specific subgroups. We divided risk and protective clusters because the ecological model uses a weighing principle which indicates that these are separate but possibly interrelating factors (Belsky, 1993). In addition, due to the amount of variables and limited sample size we were not able to analyze all variables in just one comprehensive analysis. Therefore, we first clustered risk factors separately on the child (micro), parental (meso), and environmental (macro) levels, followed by protective factors on all three levels.

The following cluster procedure took place in all analyses. First, we analyzed the exclusion of variables with small importance to the cluster model. We chose to exclude variables with a predictor importance (PI) of 0.1 or smaller that indicates that the variable is present in less than 10% of the population (Mooi & Sarstedt, 2011). This resulted in smaller number of variables and therefore better cluster fit. Next, we executed a two-step cluster analysis. The first step preclusters data based on a determination of the distance between variables with the log likelihood (Şchiopu, 2010). The second step preclusters further in a hierarchical cluster algorithm. The best fitting solution of clusters was obtained by the highest scores of the largest ratio of Bayes Information Criterion (BIC) change and ratio of distance measures (Brawijaya Professional Statistical Analysis, 2011). However, due to dichotomic variables (present/not

present) a two-cluster solution was automatically best (none and multiple factors) and thus ignored. Instead, we chose the second best BIC solution. One analysis used the third best solution because the interpretation of clusters was limited.

Next, the solution model was checked for its goodness-of-fit with the silhouette of the model. It was found fair for scores of 0.2–0.5 and good for scores higher than 0.5 (Mooi & Sarstedt, 2011). The ratio between sizes of clusters was checked and found sufficient with 3.0 or smaller and with a minimal cluster sample size of 30 cases (Gaskin, 2012). This indicates that subgroups actually differ adequately. Further, the names of the clusters were based on variables that were present in at least two-thirds of persons in the cluster sample. Variables that met this criteria were then interpreted on content. The PI was considered, meaning that the factor with a higher PI was seen as more dominant to name-giving.

Third, we analyzed demographic group differences within clusters with chi-square tests for gender and age groups (0–5; 6–12; 13–21). Finally, chi-square tests analyzed interrelations between parental risk clusters and all other clusters, since the literature states that it is largest contributor to the likelihood of maltreatment (Alink et al., 2012; Belsky, 1984; Jaffee et al., 2004). The strength was analyzed with Cramer's V.

3. Results

Here we first present the frequencies and clusters of risk factors on the child (micro), parental (meso) and environmental (macro) levels followed by the frequencies and clusters of protective factors on all levels. Demographic differences, showing significant results for age groups, are outlined below. No significant differences were found for gender (table available on request). Finally, the interrelations between clusters are analyzed.

3.1. Risk factors

3.1.1. Child level

First, we analyzed ten risk factors for their frequencies (see Appendix A). Most frequently mentioned risk factors were e*xternalizing and internalizing characteristics* (41% and 37%), *negative school experience* (36%) and *parentification and loyalty issues* (30%). The following six variables were excluded due to their low frequencies ($\leq$ 25): *(pre)natal problems, chronically ill or handicapped*, *unwanted pregnancy, negative self-esteem*, *lack of problem awareness* and *care refusal.*

Two-step cluster analyses explored potential subgroups within child level risk factors. First the prediction importance (PI) analysis excluded all factors smaller than 0.1: *burden history*, *cognitive developmental problems*, *criminological characteristics* and *difficult temperament.* Then, two-step cluster analyses of the remaining six factors revealed best fit for a three-cluster model (ratio of distance measures of 1.94; BIC = 2755.43). Table 3 presents the results.

All three child clusters cover approximately a third of the total sample. Age differences were measured. In order of cluster size, 'parentification and loyalty issues' occurred more often in children aged 6–12 (X^2 = 79.07, df 4, p = 0.00, crosstab available on request) and either external or internal 'behavioral problems' occurred more often in children aged 13–21. The third cluster indicates that no risk factors were reported, especially in young children (0–5 years). This assumes that parental or environmental problems are present in these cases.

3.2. Parental level

Sixteen parental risk factors are included. The following were registered most often: *major life events* (54%), *conflicts* (47%), *problematic partnership* (42%), *divorce* (41%), *social economic problems* (40%), *poor parenting skills* (39%) and *physical and emotional absent parent* (36%). The following variables were excluded due to their small size ($\leq$ 25): *mental disability*, *negative attitude towards the child,* and *became parent as a teenager* (see Appendix A).

Two-step cluster analyses explored potential subgroups within parental level risk factors. The PI excluded *divorce* and *delicts* due to lack of influence so that two-step cluster analysis was executed on the remaining 14 variables. Best model was a three-cluster model solution, however the interpretation was limited. Therefore, we chose the second best model, a five-cluster solution (ratio of distance measures of 1.28, BIC = 2930.72) to execute two-step cluster analyses with five fixed clusters (see Table 4).

The first cluster, 'multiple parental problems', occurs in nearly a third of the total sample. This cluster is characterized by such factors as *problematic partnership*, *major life events*, *domestic violence*, *conflicts* and *social economic problems*. The cluster is more present in the children's age groups 0–5 and 6–12 (X^2 = 24.22, df 8, p = 0.00, crosstab available on request).

Table 3
Child risk clusters (n = 250).

Clusters	Factors (% of cases within a cluster that registered a factor)	PI	%	n
1. Parentification & loyalty issues	Parentification and loyalty issues (83%)	1.0	36	90
2. Behavioral problems	Externalizing characteristics (69%)	0.43	35	87
	Internalizing characteristics (51%)	0.32		
3. No child risk factors	None		29	73

Note: Silhouette measure of cohesion and separation S(i) = 0.3, fair Ratio of sizes is 1.23, sufficient.

Table 4
Parental risk clusters (n = 250).

Clusters	Factors (% of cases within a cluster that registered a factor)	PI	%	n
1. Multiple parental problems	Problematic partnership (94%)	0.73	31	77
	Major life events (88%)	0.78		
	Domestic violence (86%)	1.0		
	Conflicts (85%)	0.63		
	Social economic problems (77%)	0.72		
2. No parental risk factors	None		28	70
3. Major life events	Major life events (93%)	0.78	16	41
	Conflicts (68%)	0.63		
4. Social economic problems	Social economic problems (85%)	0.72	13	33
5. Poor parenting skills	Poor parenting skills (83%)	0.42	12	29
	Physically and emotionally absent parent (83%)	0.40		
	De-emphasizing or denying child maltreatment (79%)	0.51		

Note: Silhouette measure of cohesion and separation S(i) = 0.4, fair.
Ratio of sizes is 2.66 with a smallest sample size of 29, sufficient.

The second cluster represents more than one-fourth of all cases and is characterized by no registered factors. The third cluster, 'major life events', represents one in six cases in the children's age group 13–21. This cluster is mostly characterized by the factors *major life events* and *conflicts*. The fourth cluster occurs in about one in eight cases and mainly represents the factor *social economic problems.* The fifth cluster is the smallest and stands for *poor parenting skills*, *physically and emotionally absent parent* and *de-emphasizing or denying maltreatment.*

3.3. Environmental level

The environmental risk level contained only one factor, *social isolation.* It is reported in about one in six cases (n = 44, 18%). This suggests that in more than 80% of the cases some form of social network is available. Cluster analysis was not necessary.

3.4. Protective factors

3.4.1. Child level

Eleven child level protective factors were analyzed (see Appendix B). The most frequently mentioned factors were *positive personality* (68%), *positive school experience* (49%), *attractive appearance* (48%), *good relations with important adult* (43%) and *social skills* (42%). The following three factors were excluded due to their low frequencies (≤ 25), *above average intelligence, problem awareness* and *locus of control.*

The two-step cluster analysis included all 11 factors, indicating that all were relevant to the cluster solution (PI > 0.1). The two-step cluster analysis found a three-cluster solution (ratio of distance measures of 1.94, BIC = 2755.43) best. Table 5 presents the results.

The largest, 'positive school experiences' cluster represents two-fifths of the cases. Due to its combined high percentage and high PI, this cluster was renamed *positive school experience* instead of *positive personality.* The second cluster occurred in a third of the cases and was found more frequently in children aged 0–5 years (X^2 = 48.71, df 4, p = 0.00, crosstab available on request). The smallest cluster, 'socially competent', occurred in about one in four children and was named after its frequently reported social factors with a high PI. It was registered significantly more often for children aged 6–12 than 13–21 years (Cramer's V available on request).

Table 5
Child protective clusters (n = 250).

Cluster	Factors (% of cases within a cluster that registered a factor)	PI	%	n
1. Positive school experiences	Positive personality (78%)	0.19	43	107
	Positive school experience (76%)	0.74		
2. No child protective factors	None		30	75
3. Socially competent	Social skills (97%)	1.0	27	68
	Attractive appearance (90%)	0.66		
	Good relationship with important adult (87%)	0.79		
	Positive personality (77%)	0.19		
	Resilience (68%)	0.82		

Note: Silhouette measure of cohesion and separation S(i) = 0.2, fair.
Ratio of sizes is 1.57, sufficient.

Table 6
Parental protective clusters (n = 250).

Clusters	Factors (% of cases within a cluster that registered a factor)	PI	%	n
1. No parental protective factors	None		32	81
2. Basic coping parent	Feeling competent (56%)	0.71	28	70
	Asking for help (54%)	0.85		
3. Multiple coping parent without positive youth experience	Positive self-image (95%)	0.99	23	58
	Asking for help (93%)	0.85		
	Feeling competent (85%)	0.71		
	Emotional availability (78%)	0.72		
	Supporting spouse (74%)	0.53		
	Willing and able to change (72%)	0.60		
4. Multiple coping parent with positive youth experience	Asking for help (100%)	0.85	16	41
	Positive youth experience (100%)	1.0		
	Emotional availability (100%)	0.72		
	Positive self-image (98%)	0.99		
	Feeling competent (93%)	0.71		
	Control of youth experience (93%)	0.72		
	Willing and able to change (90%)	0.60		
	Flexibility (90%)	0.73		
	Supporting spouse (68%)	0.53		

Note: Silhouette measure of cohesion and separation S(i) = 0.5, fair; Ratio of sizes is 1.98, sufficient.

3.5. Parental level

Eleven parental protective factors were included (see Appendix B). The following were registered most often: a*sking for help* (56%), *feeling competent* (53%), *healthcare acceptance* (50%), *emotional availability* (49%), *willing and able to change* (46%), *positive self-image* (45%) and *supporting spouse* (37%). No factors were excluded.

For this level, two factors were excluded due to their insignificant protection importance (0.1 or smaller), *healthcare acceptance* and *problem awareness*. Two-step cluster analysis was executed with the remaining nine variables (see Table 6). The best fitting model was found for a four- cluster solution (ratio of distance measures of 1.73, BIC = 1645.47).

The first cluster, 'no parental protective factors' is present in a third of all cases. The second cluster, 'basic coping parents', represents more than one in four parents. It is characterized by *feeling competent* (PI = 0.71) and *asking for help* (PI = 0.85). The third cluster, 'multiple coping parent without positive youth experience', occurs in a quarter of all cases and contains the same factors as the previous cluster but adds *emotional availability*, *supporting spouse* and *willing and able to change,* thus making it a multiple protective factor cluster. It lacks only positive youth experience. The smallest cluster, 'multiple coping parents with positive youth experience' occurs in a sixth of the sample. Again this cluster is similar to the previous cluster but distinguishes itself with *positive youth experience* and *control of youth experience.*

3.6. Environmental level

The five included environmental protective factors were all derived from the Action Plan. The most commonly observed factors were *formal network* (46%) and *informal network: relatives* (47%). No factors were excluded (see Appendix B).

Informal network: relatives showed little importance (less than 0.1, PI = 0.02) so it was left out from further two-step cluster analysis. The results for the remaining four variables revealed a five-cluster solution (ratio of distance measures of 486.84, BIC = 2.34). Table 7 presents the results. The largest cluster, 'no network', was registered for 29% of the sample.

The second cluster, 'social network', occurs in a fifth of the sample, mostly in families with children aged 0–5 and a few in the age range 6–12 (X^2 = 28.51, df 8, p = 0.00, crosstab available on request). Characterized by *informal network: social network parent*, it is

Table 7
Environmental protective clusters (n = 250).

Clusters	Factors (% of cases within a cluster that registered a factor)	PI	%	n
1. No network	None		29	73
2. Social network	Informal network: social network parent (100%)	1.0	21	53
	Formal network (58%)	0.56		
3. Formal network only	Formal network (100%)	0.56	17	43
4. Family network	Informal network: family members (100%)	1.0	17	43
	Formal network (55%)	0.56		
5. Peer network	Informal network: peers (100%)	0.58	16	41
	Formal network (50%)	0.56		

Note: Silhouette measure of cohesion and separation S(i) = 0.7, fair.
Ratio of sizes is 1.83, sufficient.

Table 8
Significant interrelations between parental risk clusters and all other clusters.

Risk	Parent clusters	1. Multi parental problem	2. No parental risk factors	3. Major life events	4. Social economic problems	5. Poor parenting skills
Environment clusters	1. Social isolation	**36.4**	0.0	9.8	24.2	13.8
	2. No risk environment factors	63.6	**100.0**	90.2	75.8	86.2
Protective Child clusters	1. Positive school experience	42.9	40.0	**48.8**	39.4	44.8
	2. No child protective factors	**27.3**	**48.6**	14.6	24.2	20.7
	3. Socially competent	29.9	11.4	**36.6**	**36.4**	34.5
Parent clusters	1. No parental protective factors	**55.8**	2.9	26.8	**45.5**	34.5
	2. Basic coping parent	5.2	**74.3**	4.9	21.2	17.2
	3. Multiple coping parent without positive youth experience	28.6	8.6	**39.0**	15.2	31.0
	4. Multiple coping parent with positive youth experience	10.4	14.3	**29.3**	18.2	17.2

associated with *formal network* in half of the sample. The third cluster, 'formal network only' (PI = 0.56), indicates that 17% of the sample depends solely on the professional network and occurs the most in children aged 0–5 years and less in children age 12–21 yeas. The fourth cluster, 'family network', indicates that the *informal network: family* is supportive. It is associated with *formal network* in half of the cases. The last cluster, 'peer network', occurs in 16% of the cases with more found in children aged more than six years. It is associated with *formal network* in half of the cluster cases.

3.7. Relations between clusters

According to Belsky (1993), maltreatment occurs in an interplay between risk and protective factors when the risk factors outweigh the protective factors. It is known that the parental level is dominant. This study, therefore, analyzed relations between clusters from the parental level perspective. We analyzed the relations between risk factor clusters, followed by the relations between parental clusters and protective clusters. Table 8 presents the results (with highest percentages in bold).

First, interrelation analyses between risk factors found moderately strong relations between parental risk clusters and environmental risk clusters (X^2 = 19.0, df = 8, V = 0.31). No relations were found between parental and child risk clusters. In-depth analyses of the crosstabs show that 36.4% of the parents in the 'multiple problem' cluster and 24% of the parents in the 'social economic problems' cluster also featured social isolation. In addition, 100% of parents in the 'no parental risk factors' cluster had no social isolation registered. This indicates that 28% of the CPS population had no parental or environmental factors registered, suggesting that this subgroup had child factors only.

Second, parental risk clusters were moderately strongly related (V = 0.37) to child protective and parental protective clusters (V = 0.42). No relations were found between parental risk and environmental protective clusters. In the multi-risk factor cluster, half the parents showed 'no parental protective factors' (55.8%) compared to other risk clusters. Moreover, the child cluster often had 'no protective factors' and 'social isolation' registered compared to other clusters, indicating that this cluster had multiple risk factors and the least number of protective factors on both parental and child levels.

The 'major life events' cluster showed the most 'multiple coping parents either with or without positive youth experience' (68.3%). Children in this cluster were the most socially competent and also had the lowest number of 'no child protective factors'. This indicates that this cluster had most protective capability on both parent and child levels of all clusters.

Parents in the 'social economic problems' cluster showed high levels of 'no parental risk' factors. This cluster also had the smallest number of 'multiple coping parents either with or without positive youth experience' and showed a relatively high percentage of social isolation, indicating that this cluster, like the multiple parental clusters, has limited protective capability. However, children in this cluster were shown 'socially competent', similar to 'major life events'.

Parents in the 'poor parenting skills' cluster had no explicitly high or low representation of protective factors. Meanwhile, the 'no parental risk' cluster showed that basic protective factors occur in a third of the cases. Nearly half the cases registered 'no protective child factors', which is the highest level of all clusters. Finally, it is worth noting that children in all parental risk clusters had some 40% *positive school experience*, 30% *resilience* and 20% 'no protective factors'. However, all parental clusters had more 'no social isolation' than 'social isolation'.

4. Discussion

4.1. Conclusion

This study found five distinct parental subgroups within the CPS population (250 cases of court-ordered family supervision), building on the interplay between risk and protective characteristics on the child, parental and environmental levels. We chose the perspective of parental risk factors as these were reported most often and confirmed the idea that they are the dominating factors for

the occurrence of maltreatment (Alink et al., 2012; Belsky, 1984; Jaffee et al., 2004).

The largest most vulnerable subgroup, 'multi parental problems' (31%), was significantly more present in children aged 0–12 years. The subgroup is characterized by (violent) conflict, major life events, economic problems and social isolation. More than half of these parents and a third of these children have few protective factors. The combination of multiple problems, relatively young children and limited protective factors makes this cluster especially vulnerable.

The next subgroup has to deal with major life events (16%), significantly more in adolescents (13–21 years old). Not related to child or environmental factors, this cluster is characterized by severe single parental problems from such life events as illness or death, divorce or immigration (ten Berge, Eijgenraam, & Bartelink, 2014) and often comes with conflicts. Interestingly, this cluster can potentially benefit from many positives on both sides: parents (positive youth experience, emotional availability, positive self-image and feeling competent) and children (socially skilled, positive school experiences).

The social economic cluster (13%) is characterized by problems concerning housing, unemployment, finance and social isolation. Parents in this vulnerable group have the fewest protective factors of all clusters. The relation between social economic problems and maltreatment has been found in all prevalence studies in the Netherlands and confirms the vulnerability of this cluster (Alink et al., 2012).

Next, we distinguished a subgroup with poor parenting skills (13%). Half of the parents can benefit from multiple protective factors, but a third had no protective factors registered.

The last cluster represents parents with child risk factors only and no parental nor environmental risk factors registered (28%). Half of these children had no protective factors registered either. This contrasts with the literature that suggests that maltreatment is mostly dominated by parental factors (Alink et al., 2012; Belsky, 1984; Jaffee et al., 2004). One explanation is that some juvenile family court orders are based solely on child factors, such as externalizing behavior. Another explanation could be that the registration of actual risk and protective factors is not complete. At the time of our data collection, a CPS was obliged to complete the Action Plan in the first six weeks of case management. However, professionals argue that it is sometimes hard to get in touch with a family in this short period.

4.2. Limitations

A study based on client records has some limitations. Firstly, we focused on only one Dutch CPS, limiting generalizability to other regions in the Netherlands. However, to our knowledge this is the first thorough file study on the characteristics of CPS clients in the Netherlands. Secondly, this study had to leave out some factors that were mentioned in literature as relevant contributors, due to low frequencies; for example, *negative attitude towards child, chronic illnesses in child, locus of control* and *unwanted child*. Some factors mentioned in the literature did not appear as often in the study as expected, such as *mental disabilities, psychiatric* and *addiction problems* (Berger et al., 2004; Dubowitz & Bennett, 2007; Friedman et al., 2011; Runyan et al., 2002; Zielinski & Bradshaw, 2006). We tried to reduce this problem in our study by using data from the Action Plan. Follow-up interviews with professionals about these factors could give more insight into the missing data. Thirdly, this study depended highly on the registration behavior of professionals who were guided by the standardized protocols of LIRIK and Action Plan (both not validated instruments). The instruments register only the occurrence of risk and protective factors and do not specify the meaning of an absent factor. Thus, 'no factor' in the client record does not necessarily mean that the factor is absent in the family. It could also indicate that a professional did not observe the factor or forgot to report it. This limits the interpretation of the 'no factor' outcome.

4.3. Implications

This study analyzed the CPS client files in order to better understand the healthcare needs of this population. The study was able to identify most commonly mentioned risk factors. The prevalence rates of risk factors as reported in our study gives insight into the actual scope of specific problems which enables local policy makers to allocate their healthcare budget. Depending on the type of problems policy makers can stimulate interventions to address problems in housing, employment or parenting support in certain areas.

The classification in subgroups confirmed the dominance of parental risk factors. This is especially relevant for practitioners working with these cases. First, identifying differences in CPS families reveals specific healthcare needs which can stimulate the shaping of case management to a better fit. For instance, 'multiple parental problems' or 'social economic problems' would benefit more from a multi-level case management approach that resolves risk factors and activates protective factors. In contrast, single-level problems, such as 'major life events' and 'poor parenting skills' can benefit from a strategy that explicitly utilizes the protective factors to stimulate empowerment in a family.

Shaping case management requires another sort of cooperation between a CPS case manager and various healthcare institutes. For instance, the social economic cluster strongly depends on close relations with organizations dealing with housing issues and financial debt. Poor parenting depends on programs that build parenting skills, such as Triple P (Prinz, Sanders, Shapiro, Whitaker, & Lutzker, 2009).

Further, the study found protective factors within the CPS population that case management and families can benefit from. Protective factors are the positive abilities of people that can be used and stimulated in the health care process in order to empower children and families to cope with the consequences of maltreatment and prevent the (re)occurrence of maltreatment. The presence of protective factors in cases confirms the potential to improve empowerment in this complex population, as suggested in the Youth Act. Moreover, it confirms the notion that every family has the potential to benefit from, as suggested in problem-solving strategies like Signs of Safety (Turnell & Edwards, 1997).

Our study is one of the first exploring the presence of protective factors and we based our selection upon those factors most consistently mentioned in research (Carr, 2006; Hengartner et al., 2013; Rooijen et al., 2013; Thoburn et al., 1995). Unfortunately little is known about protective factors, let alone about the reasons for a lack of protective factors in families. This may partly be due to the registration behavior as mentioned in our limitations section, but could also indicate that we need further theoretical knowledge on the functioning of other factors (not identified in previous studies as being protective).

Identifying protective factors is not enough, they should also be actually utilized and stimulated by health care practitioners. Protective factors must be integrated in case management interventions to let families benefit from their potential. According to the literature, working with empowerment requires a shift in professional attitude from working only on reducing risk factors to utilizing protective factors as well, especially in the compulsory field of child protection (Turnell & Edwards, 1997). Thorough implementation of a more solution-focused approach like Signs of Safety and an ongoing learning process is required to support professionals in this shift (Rijbroek, Strating, & Huijsman, 2017). Follow-up evaluation can explore the extent to which case managers have integrated protective factors in their Action Plan by, for instance, analyzing the use of protective factors in goal setting.

This first in-depth study of CPS families in the Netherlands requires further research with larger sample sizes, for instance, and data from different regions to confirm its findings. We recommend including such demographics as educational background, family size and composition, and ethnical background. But, again, research on its own is not enough to reshape CPS case management into customized child protection. A dialogue between academic researchers, health care practitioners, policy makers and clients themselves is necessary to be able to interpret research findings in the context of daily work practices of health care practitioners, to provide health care practitioners and policy makers insight in their CPS population and to learn from clients and families themselves how they experience health care. Building upon the knowledge and experience from all of these stakeholders more effective case management can be developed and implemented.

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Appendix A. Frequencies of included risk factors with source (n = 250)

	n	%	source
Child risk factors			
Externalising characteristics	105	41	Action Plan
Internalising characteristics	93	37	Action Plan
Negative school experience	91	36	Action Plan
Parentification and loyalty issues	75	30	Action Plan
Burden history	63	25	LIRIK
Young child, age <5 years	59	24	LIRIK
Difficult temperament	50	20	LIRIK
Social problems	37	15	Action Plan
Crimonological characteristics	30	12	Action Plan
Cognitive developmental problems	30	12	Action Plan
Negative self-esteem	24	10	Action Plan
Chronically ill or handicapped	20	8	LIRIK
Lack of problem awareness	15	6	Action Plan
Unwanted pregnancy	9	4	LIRIK
Care refusal	8	3	Action Plan
(Pre)Natal problems	7	3	Action Plan
Parental risk factors			
Major life events	134	54	LIRIK
Conflicts	117	47	LIRIK
Problematic partnership	104	42	LIRIK
Divorce	102	41	Action Plan
Social economic problems*	101	40	LIRIK
Poor parenting skills	97	39	LIRIK
Physical and emotional absent parent	89	36	LIRIK
Domestic violence	69	28	LIRIK
History of using violence to a person	62	25	LIRIK
Unstable and chaotic lifestyle	57	23	LIRIK
Substance abuse	57	23	Action Plan

Victim of child maltreatment	48	19	LIRIK
Delicts	43	17	Action Plan
History of executing child maltreatment	42	17	LIRIK
Low educated	32	13	LIRIK
Negative attitude towards the child	24	10	LIRIK
Mental disability	20	8	LIRIK
Became parents as a teenager	13	5	LIRIK
Environmental risk factors			
Social isolation	44	18	LIRIK

Appendix B. Frequencies of included protective factors with source (n = 250)

	n	%	source
Child protective factors			
Positive personality	169	68	Action Plan
Positive school experience	122	49	Action Plan
Attractive appearance	121	48	LIRIK
Good relationship with important adult*	108	43	LIRIK
Social skills	105	42	LIRIK
Sufficient development	70	28	Action Plan
Resilience	59	24	LIRIK
Willing to change	59	24	LIRIK
Positive self-image	45	18	LIRIK
Leisure activities	41	16	Action Plan
Healthcare acceptance	26	10	Action Plan
Above average intelligence	24	10	LIRIK
Problem awareness	12	5	Action Plan
Locus of control	1	0	Action Plan
Parental protective factors			
Asking for help	139	56	LIRIK
Feeling competent	132	53	LIRIK
Healthcare acceptance	126	50	Action Plan
Emotional availability	122	49	LIRIK
Willing and able to change	115	46	LIRIK
Positive self-image	113	45	LIRIK
Supporting spouse	92	37	LIRIK
Flexibility	74	30	LIRIK
Control of youth experience	64	26	LIRIK
Positive youth experience	54	22	LIRIK
Problem awareness	47	19	Action Plan
Environmental protective factors			
Informal network: relatives	118	47	Action Plan
Formal network	116	46	Action Plan
Informal network: social network parent	66	26	Action Plan
Informal network: peers	58	23	Action Plan
Informal network: family members	56	22	Action Plan

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