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## Psychometric properties of the early prosocial behaviour questionnaire

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### ABSTRACT


In this paper, we introduce a parent report questionnaire that assesses three different domains of early prosocial behaviour, namely helping, comforting and sharing. Participants were 202 German mothers with children at the ages of 18 and 30 months. Results showed that a three-factor model (representing the three domains of prosocial behaviour) fitted the data more accurately than a single-factor model. Longitudinal confirmatory factor analysis revealed configural and metric invariance of the three-factor model over measurement occasions and, furthermore, analysis of the factor variances and covariances yielded equivalent structural relations between factors across age. These findings legitimize the use of the questionnaire for mean comparison analysis and longitudinal change assessments.

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**KEYWORDS** Domains of prosocial behaviour; prosocial questionnaire; toddlerhood; helping; sharing; comforting

Prosocial behaviour has been defined as any voluntary behaviour that is intended to benefit another (Eisenberg, Fabes, & Spinrad, 2006). In the last decades, the emergence and development of prosocial behaviour has become a topic of great interest in the field of developmental psychology. While earlier approaches looked at the development of prosocial behaviour in rather general terms, the field has moved towards differentiating different types of prosocial behaviour, namely helping, sharing and comforting (Dunfield, 2014). Based on behavioural studies in toddlerhood and preschool age, there is evidence that the different types or domains of prosocial behaviour are not correlated, and show domain-specific developmental trajectories as well as different social and socio-cognitive correlates (Dunfield, Kuhlmeier, O'Connell, & Kelley, 2011; K rtner, Schuhmacher, & Collard, 2014; Schuhmacher, Collard, & K rtner, 2016; Svetlova, Nichols, & Brownell, 2010).

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However, questionnaires that assess prosocial behaviour lag behind this conceptual development in the field. For instance, the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) – one of the most frequently used behavioural screening questionnaire for children and youths – contains a prosocial scale that includes diverse actions whose common theme is showing concern for others, however, no distinction is made between the different types of prosocial actions. Furthermore, the SDQ is applicable for children ranging from 3 to 16 years of age. To the best of our knowledge, there is no established questionnaire assessing the different domains of prosocial behaviour at the time of their emergence, that is, during the second year of life.

In the current study we generated a parental questionnaire to assess prosocial activities that toddlers may engage in, accounting for domain-specificity. In line with the taxonomy proposed by Dunfield (2014), the questionnaire covers three prosocial domains: (a) *Helping* is defined as any action that is intended to facilitate the acquisition of another individual's goal, for instance, by passing over an object that the other reaches for or by helping to clean up (Dahl, 2015; Rheingold, 1982); (b) *Sharing* refers to actions that grant another individual the use or possession of a material resource (Rheingold, Hay, & West, 1976); (c) *Comforting* refers to actions that are intended to alleviate another individual's negative emotional state (Zahn-Waxler & Radke-Yarrow, 1990).

Overall, this study pursued two main goals: (1) Provide empirical evidence for the domain-specific nature of prosocial behaviour based on maternal report data; (2) Test for the longitudinal invariance of the factorial structure of the present questionnaire, that is, test for the stability of the questionnaire's underlying constructs (prosocial domains) over time, in order to establish a robust instrument for assessing early prosocial behaviour in future research.

## Methods

### Participants

A total of 202 German mothers ( $M = 35.17$  years,  $SD = 3.86$ , range from 24.50 to 45.50 years) from educated middle-class families completed the questionnaire. Ninety-four per cent of the mothers held a high school degree or higher. Questionnaires were filled out at the children's age of 18 months ( $M = 17.91$ ,  $SD = .39$ , range from 17.25 to 19.94) and 30 months ( $M = 29.94$ ,  $SD = .45$ , range from 29.04 to 31.74). Gender composition of the children's sample was equal (47% girls, see Appendix B for further information concerning the sample and the recruitment process).

### Questionnaire

In order to assess toddlers' prosocial behaviour, we generated questionnaire items that included the essential aspects of the three central prosocial domains

**Table 1.** Questionnaire items.

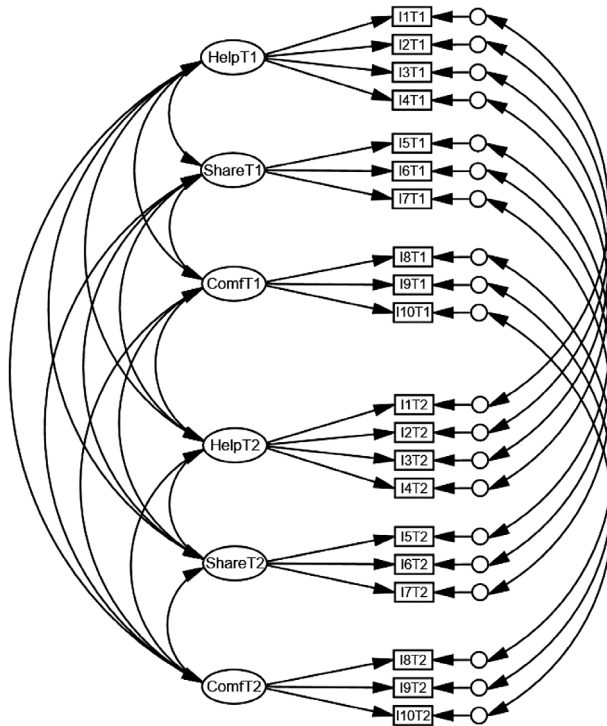
Item	Content
	My child
I1	... helps with household chores
I2	... helps cleaning
I3	... helps carrying items (e.g. plates, hamper ...)
I4	... helps tidying up
I5	... shares things with others
I6	... shares his/her things
I7	... shares food or snacks with others
I8	... comforts others when they are sad or unhappy
I9	... comforts others (e.g. hugs, pets, puffs)
I10	... takes care of others when they are hurt or sick

Note: For the original items' order and the entire questionnaire, see Appendix A.

(Dunfield, 2014): (a) Helping (e.g. *my child helps tidying up*), (b) Sharing (e.g. *my child shares things with others*), and (c) Comforting (e.g. *my child comforts others when they are sad or unhappy*). All items were rated on a four-point Likert-scale ranging from *This behavior occurs ... almost never* (1) to *... almost always* (4). The questionnaire was initially designed to assess toddlers' prosocial actions in broader terms, and thus, mothers completed a questionnaire that comprised a total of 15 items that refer to a variety of prosocial actions (including helping, sharing, and comforting, as well as more general prosocial actions that did not clearly reflect one of the domains of interest). In order to create three conceptually homogeneous factors that covered the three prosocial domains, prior to the analysis, we examined the items and included only those items, which (i) could be clearly allocated to only one of the domains of interest (thus, we excluded the item 'shares things to comfort others' which is associated with both sharing and comforting, and the item 'takes care of younger children', which implies another type of prosocial action (Rheingold & Emery, 1986) that is not embodied in the taxonomy described above), (ii) refer to a specific domain of prosocial behaviour in general, without limiting the recipients (thus, we excluded items entailing situations limited to peer-interactions), (iii) referred to everyday situations (thus, we excluded items that occurred rarely in daily life, for example, 'wants to help when something is broken or needs to be repaired'). Consequently, a total of 10 items were considered for the analysis (see Table 1). See Appendix A for the German and English version of the questionnaire with the initial 15 items.

### Statistical analysis

The data analysis consisted of fitting the data to several models (with increasing constraints) and conducting model comparisons in order to assure that the constraints did not worsen the fit of the model. For each model described below, we used a single-group framework, where the residual variances of the indicators were allowed to correlate over measurement occasions (see Figure 1),



**Figure 1.** Mode to estimate measurement invariance for longitudinal data.

Notes: T1 = first measurement occasion; T2 = second measurement occasion; I = indicator.

in order to account for the longitudinal nature of the data-set (Vandenberg & Lance, 2000). To estimate the parameters, we used the weighted least squares means and variance adjusted estimation technique (WLSMV), which provides the best option to account for ordinal data (Brown, 2015). We used R (R Core Team, 2015), and the lavaan packages (Rosseel, 2012) for all analyses.

Following the two main goals of the study, the analysis proceeded in two steps: In the first step, we conducted a confirmatory factor analysis in order to test the accuracy of a three-factor model over a single-factor model. For the single-factor model, we specified a model with one common factor within each measurement occasion. For the three-factor model, we specified a second model with three common factors within each measurement occasion.

In the second step, we used confirmatory factor analysis in order to test for the invariance of the three-factor structure across measurement occasions. Three nested models with increasing constraints were specified and fitted to the data: First, to test for configural invariance, we specified the three-factor model described above without any constraints. Second, to test for metric invariance we specified a second model, in which the factor loadings were constrained to be equal across measurement occasions. In the third and final model, the

factor variances and covariances were additionally constrained to be equal across measurement occasions.

The lavaan package provides a chi-square test and a chi-square difference test with a scaling correction for the maximum likelihood (Satorra, 2000), which is more accurate for ordinal data; however, because chi-square tests become extremely powerful when sample size is large (Cheung & Rensvold, 2002), we based the overall model fit assessments and model comparisons on the CFI and RMSEA fit indices, since they are independent of sample size. Thus, we used the criteria suggested by Van de Schoot, Lugtig, and Hox (2012) who stated that models with values of CFI  $>.90$  have an adequate fit, and recommended using a value of .08 as an upper limit for the RMSEA. In addition, the fit indices of each model were compared with those of the previous one in order to test whether a model with constraints fitted as well as a model with less constraints. According to Chen (2007), a decrease of  $\geq .005$  in CFI, and an increase of  $\geq .01$  in RMSEA, was taken as an unacceptable decrease of model fit.

## Results

Concerning the first step of the analysis, inspections of the goodness-of-fit indices showed that the three-factor model was more accurate than the single-factor model (see Table 2). Concerning the analysis for measurement invariance across measurement occasions, all three models proved to have excellent model fit, judged by their CFI (all  $> .95$ ) and RMSEA values (all  $< .05$ ). Model comparisons based on the decrease of CFI and increase of RMSEA yielded no substantial differences. On the contrary, restricting the factor loadings and the factor variances and covariances to be equal across measurement occasions resulted in a slight improvement in model fit, taking into consideration the increase in CFI and decrease in RMSEA (see Table 3). Figure 2 presents the final model, which fits the data for both measurement occasions, with the standardized factor loadings and correlations between factors. All three factors were positively correlated and ranged from  $r = .28$  to  $r = .36$ , all  $ps < .001$ .

## Discussion

The first aim of the current study was to test the domain-specific nature of early prosocial behaviour based on maternal report data. Results indicated that the hypothesized three-factor structure was a reasonable empirical map of the latent constructs, which represents the data more accurately than a single-factor structure. This indicates that German mothers' responses were driven by the hypothesized conceptual frame of reference, in which the domains of helping, sharing and comforting are understood as different constructs. Interestingly, there were only small to medium correlations between the three domains of prosocial behaviour at both measurement occasions. Thus, these findings nicely

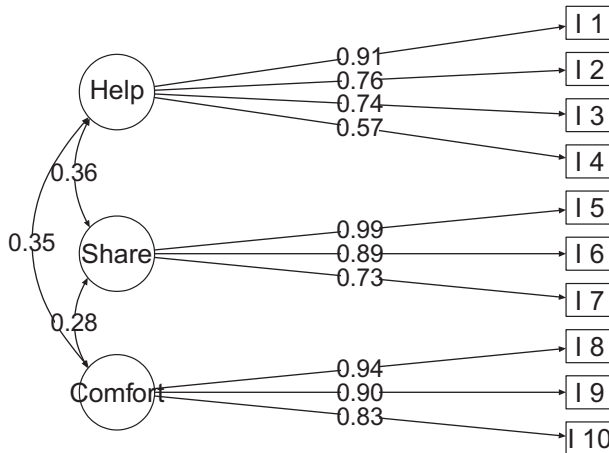
**Table 2.** Comparison of the single-factor model with the three-factor model.

Model	Scaled $\chi^2$	df	$p$	CFI	RMSEA	90% CI-RMSEA	AIC	BIC	$\chi^2_{diff}$	DIF df	$p$
Single-factor model	1236.01	159	<.001	.795	.184	[.174, .193]	8924.7	9093.4	–	–	–
Three-factor model	203.68	145	.001	.989	.044	[.029, .058]	8047.4	8262.4	905.32	13	<.001

Notes: The scaled chi square difference test for non-normal outcomes was not provided by the R lavaan package for this model comparison. Instead, we calculated the chi square difference test for normal outcomes.

**Table 3.** Longitudinal measurement invariance with WLSMV estimator.

Model	Scaled $\chi^2$	df	$p$	CFI	RMSEA	90% CI-RMSEA	Scaled $\chi^2_{diff}$	DIF df	$p$
First Model (configural invariance)	202.68	145	.001	.989	.044	[.029, .058]	–	–	–
Second Model (metric invariance)	210.51	155	.002	.989	.042	[.026, .056]	9.61	7	.229
Third Model (equality of factor variances and covariances)	206.51	158	.006	.991	.039	[.022, .053]	3.46	3	.295



**Figure 2.** Final model with constrained factor loadings, factor variances and covariances. The model fits the data for both measurement occasions.

Notes: All measures are standardized. The items' content is presented in Table 1.

map on the behavioural data of previous studies and further corroborate the differentiation of helping, sharing and comforting as different domains of early prosocial behaviour (Dunfield et al., 2011; Svetlova et al., 2010).

The second aim of the study was to establish a robust instrument to assess different prosocial domains in early childhood, inasmuch as currently there is no parental questionnaire that accounts for the domain specificity of prosocial behaviour during early childhood. The data show that the presented instrument is characterized by configural invariance across time (i.e. measures reflected the hypothesized underlying constructs) and metric invariance across time (i.e. equality of scaling across measurement occasions). Additionally, the equality of domain intercorrelations across measurement occasions could also be shown. As a consequence, these findings legitimize the use of the questionnaire for both mean comparison analysis and longitudinal change assessments (Vandenberg & Lance, 2000).

In conclusion, the present study provides empirical evidence for the domain-specific nature of prosocial behaviour based on maternal reports and offers a useful instrument to assess the three main domains of prosocial behaviour in early childhood. Future research should address the applicability of the questionnaire across different social milieus and cultural contexts and, additionally, test the reduced version of the questionnaire comprising 10 items since it cannot be precluded that the five items excluded might have affected mothers' responses. Furthermore, the questionnaire measure should be validated based on behavioural data as well as fathers' or preschool teachers' reports.



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No potential conflict of interest was reported by the authors.

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## Appendix A. The German and English original version of the early prosocial behaviour questionnaire

### Fragebogen zum frühen prosozialen Verhalten

Bitte lesen Sie sich die folgenden Beschreibungen sorgfältig durch und geben Sie an, wie oft Ihr Kind dieses Verhalten *von sich aus* zeigt. Hierbei zählen alle Versuche, egal ob Ihr Kind dabei 'erfolgreich' ist.

Dieses Verhalten tritt ... auf	① fast nie	② selten	③ oft	④ fast immer
<i>Mein Kind ...</i>				
1. hilft bei der Hausarbeit	①	②	③	④
2. teilt Sachen mit anderen	①	②	③	④
3. kümmert sich um jüngere Kinder	①	②	③	④
4. hilft beim Tragen von Gegenständen (z.B. Teller, Korb, etc.)	①	②	③	④
5. teilt seine Sachen	①	②	③	④
6. tröstet andere (z.B. umarmt, streichelt, pustet)	①	②	③	④
7. will helfen, wenn etwas kaputt ist oder repariert werden muss	①	②	③	④
8. teilt Essen oder Knabbereien mit anderen	①	②	③	④
9. tröstet andere, wenn sie betrübt oder traurig sind	①	②	③	④
10. hilft beim Aufräumen	①	②	③	④
11. kümmert sich um andere, wenn sie verletzt oder krank sind	①	②	③	④
12. hilft anderen Kindern	①	②	③	④
13. lässt andere Kinder mit seinen Sachen spielen	①	②	③	④
14. hilft beim Putzen und Säubern machen	①	②	③	④
15. gibt anderen zum Trost etwas ab	①	②	③	④

## The early prosocial behaviour questionnaire

Please read the following descriptions carefully and indicate how often your child *spontaneously* shows this behaviour. Consider every effort of your child, regardless whether the child is 'successful' in what he or she is doing.

This behaviour occurs ...	① almost never	② rarely	③ often	④ almost always
<i>My child ...</i>				
1. helps with household chores	①	②	③	④
2. shares things with others	①	②	③	④
3. takes care of younger children	①	②	③	④
4. helps carrying items (e.g. plates, hamper...)	①	②	③	④
5. shares his/ her things	①	②	③	④
6. comforts others (e.g. hugs, pets, puffs)	①	②	③	④
7. wants to help when something is broken or needs to be repaired	①	②	③	④
8. shares food or snacks with others	①	②	③	④
9. comforts others when they are sad or unhappy	①	②	③	④
10. helps tidying up	①	②	③	④
11. takes care of others when they are hurt or sick	①	②	③	④
12. helps other children	①	②	③	④
13. let's other children play with his/her things	①	②	③	④
14. helps cleaning	①	②	③	④
15. shares things to comfort others	①	②	③	④

## Appendix B. Further information concerning the questionnaire study

A total of 6.000 families in Münster (Germany) with children between the ages of 1 to 36 months were contacted by mail and asked to participate in the current study. Among the 900 families, who agreed to take part in the study, we selected 208 families. These families were selected based on two criteria: (1) Children's age: Only families with children between the ages 175 and the 185 months could participate in the study; (2) Children's cultural background: In order to achieve a homogenous sample concerning the cultural background, we selected those family households, where German was spoken as the mother tongue. Overall, the sample was representative of the German middle-class population. This assumption was based on the monthly household income, and the parents' educational level (94 and 97% of the mothers and fathers respectively held a high school degree or higher). The families were refunded for the completion of the questionnaire at both measurement occasions.

The questionnaires were sent by mail to the families, filled out at home, and sent back by post or returned personally. The data of six additional mothers was excluded from the analysis because they failed to complete the questionnaire within the second assessment.

The items were developed in German. German items were translated into English and back-translated by native German speakers, who were fluent in English. We found total consensus in the comparisons of the initial German items with the back-translated items. The English items are presented in Table 1. Previous to the main assessment, and in order to assure that mothers were able to understand each item unmistakably, the questionnaire was pre-tested in a sample of 38 German mothers. Therefore, a student assistant went through each item with the mothers in an interview setting. Mothers understood each item clearly.