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# Friendship in young children: Construction of a behavioural sociometric method

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## Abstract

We need methods to measure friendship among very young children to study the beginnings of friendship and the impact of experiences with friendship for later development. This article presents an overview of methods for measuring very young children's friendships. A behavioural sociometric method was constructed to study degrees of friendship among children in daycare centres. Friendship indications of earlier studies were verified. Data were collected by behavioural observations of 674 dyads during their free play in daycare groups. Explorative factor analysis showed a strong significant relationship among playing together, prosocial behaviour, initiatives and imitation, which could be explained by friendship. This association with friendship was not found for quarrels, rejections and proximity during snack and lunch times. Our study showed that the number of children who have one or more friends in daycare depends on the behavioural criteria used in several studies.

## Keywords

daycare, friendship, relationship, social behaviour, sociometric

A solid body of research testifies to the importance of friendship relationships in children's lives (Kernan and Singer, 2010). The experience of positive social relations with peers is a core dimension in children's well-being (Dunn, 2004) and contributes to their social, emotional and cognitive development. Children with friends are more socially competent (e.g. Berndt, 1996), are better at adapting to changes (e.g. Berndt et al., 1999) and perform better at school (e.g. Ladd, 1990). Furthermore, children with friends have higher self-esteem (e.g. Newcomb and Bagwell, 1995), lower levels of stress (Peters, 2010), less likelihood of becoming a victim of bullies (e.g. Hanish et al., 2005) and are less likely to experience anxiety or depression (e.g. Ladd and Troop-Gordon, 2003).

Studies by Parker et al. (1995), Howes (1996) and Rubin et al. (1998) show that friendships among children as young as 1 or 2 years old are possible. But studies of that age group are rare.

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More insight into the meaning and dynamics of friendship among very young children is important for various reasons. First, theoretically, it is important to understand the beginnings of friendship and the impact of experiences with friendship for later development. Second, educationally, children can become friends with unrelated peers at a very early age because they often enter into group daycare. How should teachers and parents perceive the relationships among children? Should they see such relationships as expressions of a temporary play relationship or should they take into account friendship relationships among the children. This also has implications for educational policy. In the Netherlands, for instance, such relations among young children are regarded as just playmates. Children come together for several hours in unstable groups with changing compositions of children because the days and hours spent in daycare are based on the working hours of the parents and not on the relationships of the children.

This article presents an overview of methods for measuring young children's friendships and constructing a behavioural sociometric method that integrates characteristics of friendship behaviour in very young children, which have been used in earlier studies. This behavioural sociometric method was needed to study the factors that promote or hinder the development of friendship among young children and to study the dynamics among cliques of befriended children (see Van Hoogdalem et al., 2012).

In general, researchers define friendship as 'a reciprocal, predominantly positive relationship between two young children' (Goldman and Buysse, 2007). There is less agreement about how friendships operate in young children. Three types of methods can be distinguished (Howes, 2009). First, a sociometric method of peer nominations is often used from 3 years old (Avgitidou, 2001; Drewry and Clark, 1985; Gleason et al., 2005; Guzman et al., 2004; Howes, 1988a; Howes et al., 1994; Howes and Wu, 1990; Lindsey, 2002; Roopnarine and Field, 1984; Santos et al., 2008; Sebanc et al., 2007; Vaughn et al., 2000, 2001). In these studies, the children were asked to identify their friends by using pictures of all children or by using a ranking scale. Although this method is not used for children below the age of 3 years, it is even doubtful whether it is reliable for 3-year-olds since sociometric peer nominations assume that the children understand the concept of friendship and are able to differentiate between friends and non-friends (Hymel, 1983). Sociometric peer nominations were used in this study as a test. Children were asked to choose pictures of children from their group with whom they were friends. Not all of the 3-year-olds were able to select pictures of their friends. The 2-year-olds did not understand the question; they looked very puzzled and refused to do anything, or they called all the children their friends. For this reason, sociometric peer nominations could not be used as a method to identify friends and was not further taken into account in this study.

Second, in a group of 2- and 3-year-olds, the method of sociometric nominations by knowledgeable informants such as teachers and parents was used (Buysse et al., 2002; Dunn and Cutting, 1999; Howes, 1988a, 1988b; Roopnarine and Field, 1984). In these studies, the knowledgeable informants were asked to identify friends by using questionnaires or by using a definition of friendship. Howes (1988a), for instance, told parents that 'friendship is a dyadic relationship including mutual preference, mutual enjoyment, and the ability to engage in skilful interaction' (p. 22). In the study by Roopnarine and Field (1984), no definition of friendship was given. In this regard, the method is even more vulnerable to the assumptions knowledgeable informants make about friendship. Sociometric nominations by teachers were used in this study as a test. Teachers were asked to say which children were friends. The teachers indicated that the part-time presence of both teachers and children made it impossible for them to do this. Therefore, sociometric teacher nominations could not be used as a method to identify friends and was not further taken into account.

Third, the method of behavioural sociometric observations in natural settings was used (Dunn and Cutting, 1999; Hartup et al., 1988; Howes, 1983, 1988a, 1988b; Howes et al., 1994; Howes and Phillippsen, 1992; Roopnarine and Field, 1984; Strayer and Santos, 1996; Vaughn and Santos, 2009). In some of these studies, friendship was defined in terms of proximity; for instance, in the study by Hartup et al. (1988), children were friends if they spent at least 25 per cent of their time in each other's proximity during free play. In other studies, the definition of friendship was based on the time children interacted with each other, such as in the study by Roopnarine and Field (1984), in which children were friends when they interacted for 66 per cent or more of the observed time. In the study by Howes (1983), a success rate of 50 per cent of all social initiations was mentioned as one of the conditions for friendship. Later, Howes and colleagues (Howes, 1988a, 1988b; Howes et al., 1994; Howes and Phillippsen, 1992) considered children to be friends if they spent at least 30 per cent of the observation time in each other's proximity (defined as being within 3 feet of one another), engaged in interactive social play during this time and shared positive affect. Howes' method was used by other researchers as well (e.g. Dunn and Cutting, 1999).

In most studies, a variety of differences in social behaviour was found among dyads of children who were friends and those who were not friends. In general, these studies show that young children who are friends show predominantly prosocial behaviour towards one another. Howes (1988a, 1988b) found that 1- to 6-year-old children expressed a different pattern of initiations and responses to friends than to non-friends. Whaley and Rubenstein (1994), who studied four 22- to 32-month-old befriended dyads, found that friends helped one another; they looked for intimacy by separating themselves from other peers in the environment and had close physical contact; they showed loyalty by protecting both interactive space and objects and they often imitated one another and expressed the same attitudes, values, opinions and interests. Dunn and Cutting (1999) found different patterns among 3- and 4-year-old befriended dyads with respect to conflicts; some friends argued and quarrelled frequently, while in other befriended dyads, quarrels were rare and quickly resolved.

Findings regarding frequency, number of friends and continuity of friendship are difficult to compare because of the variety of definitions. Roopnarine and Field (1984) found that 57 per cent of all 18- to 56-month-old children had one or more friends. In Howes' study (1988a), 30 per cent of the observed 3-year-old children had no friends, 42 per cent had one friend and 28 per cent had two or more friends. Furthermore, Howes (1988a) showed that 2- to 5-year-old children had friendships that lasted 1 year or even longer.

In our study, we measured a variety of characteristics of social behaviour in befriended dyads of 2- and 3-year-old children from earlier studies and analysed whether they were related and could be explained by the underlying factor 'friendship'. We constructed a new behavioural sociometric method with a continuous scale of friendship rather than using the dichotomous scale of earlier studies.

## Methods

### *Dutch context*

In the Netherlands, 25 per cent of children from 0 to 4 years of age were enrolled in centres for group daycare in 2008 (Huynen and Meuwissen, 2008). Dutch children generally attend daycare centres part time (Centraal Bureau voor Statistiek, 2009). In this study, children attend such centres on average for 2.8 days ( $SD = 1.08$ ) a week. In the Netherlands, children attend daycare from the age of 4 months, and at 4 years, they leave daycare to enter the formal educational

system. According to the Dutch government's quality rules, the number of children allowed per group depends on the number of teachers present and is strictly regulated. For groups with 2- and 3-year-olds, a ratio of seven children per teacher is the norm.

## Participants

Observations of eight groups of children in four licensed Dutch daycare centres in urban areas (Arnhem, Den Haag, Eindhoven and Utrecht) were included in this study. The pedagogical staff and managers of the daycare organisations selected were typical with respect to cost, size and resources, and included daycare groups with experienced teachers who were interested in the study. Because this research was part of a larger project, daycare centres with different characteristics were selected.

*Ethics.* Our research design was carried out according to ethical norms and with the informed consent of the teachers and parents (Alderson, 1995; Formosinho and Formosinho, 2010). We agreed that the results would be published anonymously. However, the teachers were informed about the results of the study within 6 weeks after the observation period. The parents as a group were informed about prosocial and friendship behaviour in the group of their children with the help of illustrative videos. The quantitative results and differences in friendship behaviour in individual children were not discussed with the parents. Because of the long observation period needed, we decided to minimise intrusion in the lives of the children by taking notes rather than videotaping. We agreed not to discuss the relationships and interactions among the children with the teachers during the observation periods because we did not want to disturb the ongoing relationships by expressing premature insights. Only if we noticed serious problems that the teachers were not aware of would we signal that. For both researchers and teachers, the discussions about the report of the findings in their group after 6 weeks were important learning experiences that gave rise to new insights on how to support peer relationships in group day care. In two cases, the researchers engaged in additional requested observations for video interaction training and understanding of repeated conflicts in the group. Throughout the study, there was an ongoing concern for the well-being of the children and related ethical issues.

*Characteristics of the groups.* Four of the eight groups were multi-cultural daycare groups, consisting of children having parents of Dutch, Japanese, Caribbean, Ghanaian, Moroccan and Suriname backgrounds. These groups included on average 28 (range = 20–38) different children each week, who on average attended for 6 partial days (3 days;  $SD = 2.32$ ). A child met on average 28 peers (range = 15–37;  $SD = 7.99$ ) in the course of each week. The children in the other four daycare groups studied were all of native Dutch backgrounds. These groups included on average 29 (range = 21–34) different children each week, who on average attended for four partial days (2 days;  $SD = 1.60$ ). In the course of a week, a child met on average 20 peers (range = 6–29;  $SD = 5.07$ ).

*Characteristics of children included.* Children included in this study had to meet the following criteria: they had to be 24–44 months at the beginning of the observation period; they had to be present on at least one of the observation days, which were Mondays, Tuesdays and Thursdays; and they had to participate in the group from the beginning to the end of the observation period. We included a total of 142 children. The selected children had a mean age of 36 months ( $SD = 6.55$ ), 48 per cent were boys and 52 per cent were girls, 85 per cent had a Dutch background and 15 per cent had a different cultural background.

## Procedure

To find empirical evidence for the *interrelationships* among a variety of characteristics of social behaviour that could be explained by friendship, children were observed on two separate occasions for 1 hour during free play as well as during snack and lunch times. Free play was defined as a situation in which children were free to choose what they wanted to do with or without the teacher. Before the observation period started, observers acquainted themselves with the children; they behaved in a friendly way towards the children, but did not intervene in the children's activities. During observations, the focus was on dyads. A dyad was defined as two observed children who had the *opportunity* to socially interact with one another at least 25 per cent of the observation time. A child who came 1 day a week encountered fewer children and as a result was represented in fewer dyads than a child who came all week. In total, 674 dyads were included. On average, a child was represented in nine dyads ( $SD = 3.48$ ). For each dyad, it was determined how often (in percentages) each of the observed social behaviours – playing together, prosocial behaviour, initiatives, imitation, quarrels, rejection and proximity during snack and lunch times – was observed.

## Instruments

**Behavioural sociometric observations.** The amount of time a dyad played together, showed prosocial behaviour, took initiatives, imitated one another, quarrelled and were rejected by one another was determined by observations at 5-minute intervals. A dyad *played together* when the two children were within 3 feet of each other, engaged in a similar activity and had incidental eye contact (referred to as parallel play) or when they were engaged in a similar activity and talked, smiled, offered and received toys or otherwise engaged in social interaction (referred to as associative play; e.g. Kontos et al., 2002). During the 5-minute interval, it was determined whether the dyad showed prosocial behaviour, took initiatives, imitated, quarrelled or rejected one another. *Prosocial behaviour* by the dyad included sharing/giving, helping and showing affection towards one another (Eisenberg and Fabes, 1998). *Initiatives* included inviting the other for play or asking and showing positive attention towards one another. *Imitation* included copying of one another's verbal and non-verbal behaviours (Meltzoff, 1988). A *quarrel* is a serious conflict that occurred when the dyad showed clear negative emotions such as anger, sadness, fear and/or guilt (Van Hoogdalem et al., 2008). One of the children in the dyad was *being rejected* if she or he was not admitted in the play of the other child of the dyad (Corsaro, 2004).

To determine dyad behaviour during snack and lunch times, we observed whether the members of a dyad sat next to one another at those times. From 9:00 a.m. to 9:30 a.m., all children ate a snack, and from 11:30 a.m. to 12:30 p.m., all children ate lunch. At these times, we noted which children were present and who they sat next to. We then calculated for every dyad how much of the time they actually sat next to one another of the total time they could.

## Reliability

Observers were trained and allowed to take part in this study when their reliability for each of the observed behaviours was 0.70 or higher. A random sample of all observations was independently coded to assess reliability of the observations in this study. Inter-reliability of codes was calculated with the Cohen's Kappa coefficient ( $\kappa$ ; Martin and Bateson, 1993). Different observers were used during this research, and their reliability was determined by comparing their observations of at least 2 hours with those of the senior researchers. For all eight observation periods, the overall

**Table 1.** Descriptive percentages of the observed behaviours of the dyads during 5-minute observations.

Observed variable	<i>M</i> (%)	<i>SD</i> (%)	Range
Playing together	12	15.0	82
Pro-social behaviour	1	2.3	15
Initiatives	3	5.7	41
Imitation	2	3.8	25
Proximity during snack and lunch times	13	13.6	100
Quarrels	0.6	1.9	22
Rejections (being rejected)	0.5	1.4	11

*SD*: standard deviation.

average reliability for peers available for social interaction was 0.86. The overall reliability for playing together was 0.85, for prosocial behaviour was 0.78, for initiatives was 0.71, for imitation was 0.71, for quarrels was 0.73 and for rejections was 0.71. There is substantial agreement when  $\kappa$  is between 0.61 and 0.80, and an almost perfect agreement when  $\kappa$  is between 0.81 and 1.00. Thus, the reliability of the observations in this study was high (De Vocht, 2004).

### Statistical analyses

Factor analysis is a method used to find one or more unobserved variables, also called latent variables or factors, which can account for the covariance among a set of observed variables. Explorative Factor Analysis (EFA) was performed using SPSS to reveal possible interrelationships between the measured variables – percentages of playing together, prosocial behaviour, initiatives, imitation, quarrels, rejections and proximity during snack and lunch times of the dyads – which could be explained by the underlying latent factor of friendship.

Kaiser–Meyer–Olkin (KMO) and Bartlett's Test were used to determine whether the data could be grouped in a smaller set of underlying factors and thus support the use of factor analysis. For this, the KMO needs to be above 0.50. In our study, the principal axis method with a varimax rotation was used. The correlation coefficient matrix gives the relationships among the measured variables. The appropriate number of latent factors was determined with the scree test. The scree test states that the 'eigenvalues of the correlation matrix need to be plotted in descending order'. The number of latent factors is equal to the number of eigenvalues that occur prior to the last major drop of eigenvalues magnitude in the scree plot. The strength of the relationship between a measured variable and the latent factor(s) is represented by the factor load. A factor load of 0.40 or higher indicates an association with the latent factor(s). These factor loads were used to calculate friendship scores.

### Results

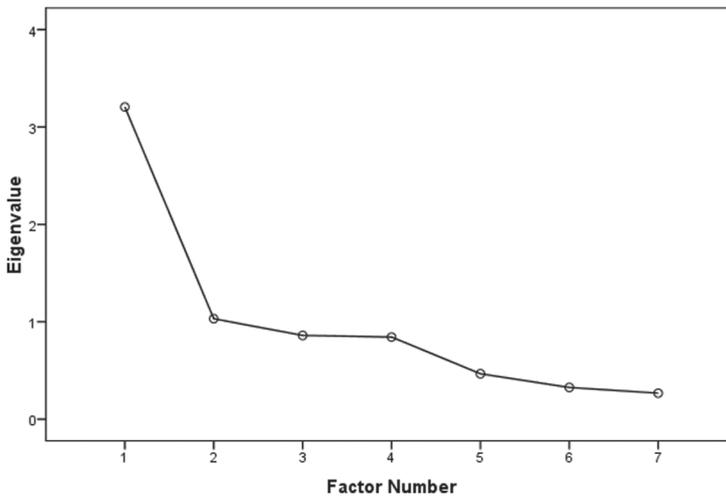
Table 1 shows an overview of the observed variables. The *SDs* and ranges reported in Table 1 suggest considerable variation across the dyads.

The use of EFA was supported by the KMO (0.85) and the Bartlett's test ( $\chi^2 = 1345.57$ ;  $p = 0.00$ ). Table 2 shows the correlation matrix, where it can be seen that the correlation among playing together, prosocial behaviour, initiatives and imitation was high.

The Scree plot (Figure 1) shows that the appropriate number of latent factors is one. The strength of the relationship between the measured variables and the latent factor is represented by the factor

**Table 2.** Correlation matrix of all observed variables.

Correlation	Playing together	Pro-social behaviour	Initiatives	Imitation	Proximity during snack and lunch times	Quarrels	Rejections
Playing together	1.00	0.58	0.68	0.72	0.24	0.23	0.19
Pro-social behaviour	0.58	1.00	0.55	0.64	0.21	0.16	0.20
Initiatives	0.68	0.55	1.00	0.68	0.21	0.24	0.21
Imitation	0.72	0.64	0.68	1.00	0.26	0.20	0.25
Proximity during snack and lunch times	0.24	0.21	0.21	0.26	1.00	0.15	0.03
Quarrels	0.23	0.16	0.24	0.20	0.15	1.00	0.02
Rejections	0.19	0.21	0.21	0.25	0.03	0.02	1.00

**Figure 1.** Scree plot.

loads represented in Table 3. Table 3 shows an association between the latent factor and the measured variables playing together, prosocial behaviour, initiatives and imitation. There seems to be no association between the latent factor and the measured variables' proximity during snack and lunch times, quarrels and rejections.

Based on the factor loads friendship scores for all dyads were calculated –  $((\text{playing together} \times 0.69) + (\text{prosocial behaviour} \times 0.65) + (\text{initiatives} \times 0.78) + (\text{imitation} \times 0.65))/4$ . All dyads together had a mean friendship score of 3.14, with a range from 0.00 to 25.57 and a *SD* of 4.12. The friendship scores provide information about the *degree of friendship* a dyad had. Of the 674 dyads, 608 dyads had a low degree of friendship, which was defined by a friendship score lower than 8.52 ( $25.57/3$ ); 57 dyads had a middling degree of friendship, which was defined by a friendship score between 8.52 and 17.05; and 9 dyads had a high degree of friendship, which was defined by a friendship score of 17.05 or higher. If only dyads of high degree of friendship are

**Table 3.** Relationship between the measured variables and the latent factor friendship.

Measured variables	Factor load
Playing together	0.69
Pro-social behaviour	0.65
Initiatives	0.78
Imitation	0.65
Proximity during snack and lunch times	0.31
Quarrels	0.05
Rejections	0.16

called friends, 20 per cent of the children had one friend. When dyads in the high as well as in the middling degree of friendship are called friends, 68 per cent of the children had one to six friends ( $M = 1.56$ ;  $SD = 1.62$ ).

Using Howes' method (Howes, 1988a, 1988b; Howes et al., 1994; Howes and Phillipsen, 1992), in which children are designated as friends if they spent at least 30 per cent of the observation time in each other's proximity, engaged in interactive social play and shared positive affect, 52 of the 674 dyads were identified as friends. In this way, 43 per cent of the children had one to four friends ( $M = 1.70$ ;  $SD = 0.88$ ).

Using Roopnarine and Field's (1984) method, in which children are designated as friends if they interacted 66 per cent or more of their observed time, 6 of the 674 dyads were identified as friends. In this way, 8 per cent of the children had one to two friends ( $M = 1.09$ ;  $SD = 0.30$ ).

## Conclusion and discussion

Our study shows that the use of sociometric peer nominations and sociometric teacher nominations is not a valid method to identify friends in a peer group of 2- and 3-year-old children in the context of Dutch daycare centres. None of the 2-year-olds and only some of the 3-year-olds were able to identify their friends. Such young children do not yet have the necessary verbal and cognitive capacities to reliably differentiate between friends and non-friends (e.g. Hymel, 1983). Nor were the teachers able to identify which pairs were friends in the group because there was too much disagreement among them; only in very few cases did they point to the same children as friends. The teachers believed this was in part because of their limited time with the children as well as the fact that the children were only at the daycares for a few hours a week. Part-time work as well as part-time attendance by the children is typical at Dutch daycare centres. Although teacher nominations may ordinarily be a trustworthy method to identify friends, it was not true in this context.

In line with our expectations, we found an interrelationship among playing together, prosocial behaviour, initiatives and imitation that may be explained by friendship. Contrary to our expectations, proximity during snack and lunch times, quarrels and rejections were not associated with this construct of friendship.

One explanation for the fact that the proximity during snack and lunch times was not associated with friendship could have been a result of teacher interventions. During the observation periods, we made field notes describing incidents when teachers separated befriended dyads during lunch time. Children who wished to sit next to one another during snack and lunch times were often separated by the teachers. For instance, Dylan and Peter were two children who always wanted to sit next to one another, but used to talk and laugh rather than eat their snack or lunch. As a result, other children became more restless, and more time was needed for the children to finish their snack or

lunch. The teachers saw this as undesirable, and therefore, Dylan and Peter were often prevented from eating with one another, contrary to their wishes.

Moreover, there was no association between quarrels and friendship. Earlier studies found that friends have more quarrels only because they spend more time together. But since we corrected for time by using percentages in our study, we did not find an association between quarrels and friendship (Gottman, 1983; Hartup et al., 1988). Overall, we did not observe many quarrels. Our field notes showed that teachers did not always intervene during quarrels, and that when they did, they seldom tried to reconcile the opponents in conflict, as reported in a recent Dutch study (Singer and De Haan, 2007; Singer et al., 2012; Singer and Hännikäinen, 2002).

Our factor analysis did not reveal any association between rejections and friendship. In 26 (39%) of the dyads identified as friends, rejections were present. Yet, further analyses showed a remarkable finding: of the 26 befriended dyads, mutual rejection was the case in only 2 of them. In the other 24 dyads, only 1 child was rejected by the other child. There may be a dominance hierarchy present within the friendship relationship. Rejections can be a strategy used by the dominant child to force his or her wishes on the subordinate child. Field notes showed that some of these dominant children only played with the subordinate children when their favourite friends were not available for play.

Our study showed the significant impact of the criteria used in dichotomous scales. When we used Howes' criteria (Howes, 1988a, 1988b; Howes et al., 1994; Howes and Phillipsen, 1992) to construct a dichotomous scale, 43 per cent of the children in our study had one or more friends. When we used Roopnarine and Field's (1984) criteria to construct a dichotomous scale, only 8 per cent of the children had one or more friends. When we made three categories of friendships based on the data of our continuous scale of friendship, we found that 13 per cent of the children had at least one significant friendship, 44 per cent of the children had at least one middling degree of friendship and 44 per cent of the children had no higher than a low degree of friendship. Thus, it is almost impossible to conclude what the right method is to determine how many children have real friends. Our study shows that friendship consists of many gradations, which makes the use of a continuous scale preferable to a dichotomous one.

In short, this study confirms earlier studies that 2- and 3-year-old children show coherence in several forms of social behaviour that can be interpreted as signs of friendship: the amount of time children play together, behave prosocially with one another, take initiatives and imitate one another's behaviour. Peers in the group are not all just playmates. Young children develop relationships with each other. But friendship relations among very young children greatly depend on their parents and teachers. In the Netherlands, the interest of the daycare organisation (full enrolment) and the parents (childcare during their working hours) dominates the admission policy. More studies are necessary to understand the impact of broken friendships at this early age on children's social development. But whatever the long-term effects may be, young children enjoy the company of friends, and therefore, it is important to support friendship among very young children.

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