Teacher and peer reports on preschoolers sociometric popularity

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Abstract

This study investigated the association between preschool children's sociometric popularity obtained from peer sociometric nominations and from teachers' classifications. A total of 1535 children (731 girls and 804 boys), aged between 34 and 89.6 months (*M* = 61.96, *SD* = 8.91), and 89 teachers participated in the study. The association between reports from the two sources, although not independent, was weak, with teachers perceiving more children as popular and fewer children as rejected. Teacher and peer classifications were similarly associated with social skills and behavior problems. Sociometric popularity obtained from teachers, but not from peers, was associated with children's age and verbal competence. Overall, findings suggest that traditional peer sociometric nominations, even at early ages, are not replaceable by teachers' classifications of children's sociometric popularity.

Keywords: sociometric popularity, preschool, affiliative relationships, teachers' classifications

Teacher and peer reports on preschoolers' sociometric popularity

Positive peer experiences help children develop social skills, adapt to new contexts, and build appropriate social networks (Rubin, Bukowski, & Laursen, 2011). Difficulties with peers, on the other hand, are associated with negative social adjustment and behavior problems (Rubin & Coplan, 2010), predicting social problems later in life and, ultimately, clinically significant behavior and affective disorders (Chen, Wang, & Cao, 2011; Chung-Hall & Chen, 2010).

Peer sociometric status can be used as an indicator of children's sociometric popularity within the peer group, reflecting the quality of children's experiences with peers. The predictive value of sociometric popularity for children's social (Aikins & Litwack, 2011) and academic and cognitive outcomes (Kiuru et al., 2015; van der Wilt, van der Veen, van Kruistum, & van Oers, 2018) is consensual within the field of developmental psychology, allowing for the identification of children at risk for negative outcomes. Being accepted by peers is considered a good indicator of social adjustment (Schneider, 2016) while peer rejection is both a correlate of other problems (e.g., aggression) and a predictor of future (negative) adjustment (Ladd, 2006).

The "peer nomination" method (Moreno, 1934) is the most commonly used sociometric technique for assessing children's likeability within the peer group. Sociometric peer nominations, based on positive and/or negative criteria, have proven relatively stable over time, even during the primary (Nowicki, 2003) and preschool years (Peceguina, 2010). Further, this method allows access to the peer group perspective on the likeability of each child, providing a means to obtain a deeper understanding of children's peer-related social experiences. However, it is not uncommon that decisions regarding the need and eligibility for interventions targeting children's social skills, peer interactions, and affiliative relationships are based on teachers' reports rather than children's perspectives.

This study adds to the limited knowledge on the associations between peer and teacher's perspectives regarding young children's likeability within the peer group, by investigating the association between preschool children's sociometric popularity obtained from peer sociometric nominations and from teachers' classifications. Within the ecological systems theory (Bronfenbrenner, 2005), the peer group is an important microsystem influencing (and influenced by) young children's characteristics, behaviors, interactions, and relationships. However, compared with other age periods, research on peer-related social experiences in preschool is limited, even though in most developed countries, including Portugal, preschool enrolment exceeds 90% (OECD, 2018).

Social Status Within the Peer Group in Early Childhood

Coie (1990) distinguished two stages of "causation" or development of peer-related social status; in the first stage, behavior leads to status; in a subsequent stage, status drives behavior. Young children's decisions on who they like and dislike are prompted by behaviors. Consequently, at an early stage, a child's behavior and peer-related social competence, or the lack thereof, might determine their social status. In short, sociometric popularity is viewed as an indicator or social competence, whereas peer rejection is viewed as an indicator of social incompetence. Popular children experience good relationships with peers, which promote their development and social skills. Rejected children, on the contrary, experience poor relationships that prevent them from acquiring better skills, gradually moving towards risk (Cillessen, 2011; Cillessen & Bukowski, 2018). Importantly, peer social rejection has an impact that goes beyond the "outside" realm of interactions and relationships. In a study examining cortisol levels and preschool social behaviors, results indicated an association between (higher) cortisol levels and isolation (Sanchez-Martin et al., 2001).

Exclusion from the peer group, during preschool, has been consistently associated with negative outcomes, suggesting that peer rejection during these early years is a valid predictor

of future difficulties (Heinze, Miller, Seifer, Dickstein, & Locke, 2015). When children are excluded from the peer group, they miss opportunities for interacting and practicing social skills (Laine, Neitola, Auremaa, & Laakkonen, 2010). Further, peer rejection seems to be associated with some forms of bullying during preschool (e.g., systematic exclusion from play and relational victimization) (Godleski, Kamper, Ostrov, Hart, & Blakely-McClure, 2015; Helgeland & Lund, 2017). Peer rejection also predicts lower self-regulation and, in turn, poor self-regulation increases the likelihood of peer exclusion (Stenseng, Belsky, Skalicka, & Wichstrøm, 2015). Associations with ADHD have also been found, with peer rejection adversely affecting symptoms regardless of subtypes (Stenseng, Belsky, Skalicka, & Wichstrøm, 2016).

Characteristics of Young Children in Different Sociometric Status Groups

Based on Moreno's approach (1934), Coie, Dodge, and Coppotelli (1982) and Newcomb and Bukowski (1983) developed a set of procedures to assign children to sociometric groups defined by certain patterns of positive (i.e., liked most) and negative (i.e., liked least) nominations from each member of the peer group. Briefly, children may be classified into one of four extreme social groups: *popular* (overall well liked), *rejected* (overall disliked), *controversial* (both liked and disliked, high visibility), and *neglected* (neither liked or disliked, low visibility). An additional group, *average*, includes children falling in between both positive and negative nominations.

Several characteristics distinguish children in each sociometric group, particularly *popular* and *rejected* children (Nelson, Burner, Coyne, Hart, & Robinson, 2016; Slaugther, Imuta, Peterson, & Henry, 2015). Research with preschool children indicates that popular children, in general, display higher levels of social competence (Ladd & Sechler, 2013; Peceguina, 2010), sociability, cognitive abilities, participation in group activities (Gazelle, 2008), and verbal competence (van der Wilt et al., 2018), as well as lower levels of aggressive and

withdrawal behavior. Some studies report sex differences, with girls more popular than boys (von Grunigen, Perren, Nagele, & Alsaker, 2010).

In contrast, preschool-aged children who are *rejected* are more likely to behave aggressively or to withdraw from interactions, and more likely to be socially (Peceguina, 2010) and cognitively less skilled (Menting et al., 2011). Often, they report feelings of loneliness and social dissatisfaction (Heinze et al., 2015), and show more propensity towards externalizing problems such as aggressiveness and anti-social behavior (Stenseng, Belsky, Skalicka, & Wichstrøm, 2014) and/or internalizing problems such as depression and anxiety (Rubin, Bukowski, & Parker, 2006; Wichstrøm, Belsky, & Berg-Nielsen, 2013). Rejected children are the most frequently studied group, regarding aggressive behavior, social rules violation, hyperactivity, and general disruptive behavior (Rubin et al., 2006). These behavior problems are a strong predictor of social rejection (Gifford-Smith & Brownell, 2003). However, not all rejected children are aggressive; those who are not, usually have higher apathy levels and more difficulties engaging in exploratory behavior (Rubin, Coplan, & Bowker, 2009). Rejected non-aggressive children, most frequently girls, have higher levels of internalizing behavior, namely social withdrawal (Rubin et al., 2006). On the contrary, rejected and aggressive children, usually boys, present high levels of externalizing behaviors in preschool (see Rubin et al., 2006), and in elementary school (White & Kistner, 2011).

Controversial children exhibit a combination of popular and rejected children's characteristics. Controversial preschool-aged children might be conflictual and aggressive and/or reveal higher levels of internalizing behavior (Morais, Otta, & Scala, 2001), as rejected children. They can be extremely agreeable with some peers and extremely unpleasant with others (van der Wilt et al., 2018). *Neglected* children have received less attention because they are difficult to identify from a methodological and practical perspective, as their behaviors are not usually disruptive, and they receive virtually no negative or positive affiliative

nominations (Rubin et al., 2006). The scarce information on these children poses challenges on characterizing them as a group (Rubin et al., 2011). Finally, children falling in between these characteristics are described as *average*, showing medium levels of acceptance, rejection, social impact, and social preference (Morais et al., 2001).

We note that language might be one of the key predictors of a child sociometric status. According to Vygotsky' cultural-historical theory (1978), the primal function of language is social, with language serving as a tool for interaction with others and a way to regulate other's behavior. As a result, when a child has difficulties using language in preschool, the likelihood of experiencing conflict and misunderstandings with peers might increase (McCabe & Meller, 2004; Menting, van Lier, & Koot, 2011; Nærland, 2011). In addition, parental education is consistently positively associated with young children's social, emotional, and cognitive development (e.g., Burchinal, Zaslow, & Tarullo, 2016; Hartas, 2011), even when accounting for other socioeconomic status (SES) indicators, such as household income (Brooks-Gunn & Duncan, 1997).

Assessing Peer Group Sociometric Popularity

As discussed by Cillessen (2011, p. 94), "Coie et al. (1982) provided the standard method for sociometric status assessment...", establishing the "classic sociometric status types" based on children's positive and negative peer nominations. In addition, theirs is the "most commonly cited procedure for measuring sociometric status via peer nominations" (Gifford-Smith & Brownell, 2003, p. 239). Peer sociometric nominations are, thus, important in identifying children who are rejected or are at-risk of peer rejection, allowing access to peer group experiences based on insiders' views. However, some limitations have been attributed to this method such as (1) the time-consumption for obtaining and analyzing data, (2) difficulties in obtaining parental consent for all children in the classroom, (3) potential limited stability of young children's social preferences (Wu, Hart, Draper, & Olsen, 2001), and

(4) ethical issues regarding the potential negative consequences of asking children to nominate peers they do not like to interact with (Bell-Dolan & Wessler, 1994). As a result, teachers are sometimes considered possible alternative sources for obtaining information on young children's social experiences in the peer group (Cillessen, 2011; Maedgen & Carlson, 2000; Nelson, Robinson, & Hart, 2005).

Arguments favoring this approach include the fact that teachers' ratings on other dimensions of children's social development are valid and reliable, from specific conditions (e.g., Attention Deficit Hyperactivity Disorder; Thomas, Sanders, Doust, Beller, & Glasziou, 2015), to wider constructs (e.g., children's social skills; Gresham & Elliott, 1990; and behavior problems; van Lier et al., 2012). Furthermore, preschool teachers spend considerable amounts of time with children in the classroom, observing their interactions (McMullen, Veermans, & Laine, 2013) and promoting, regulating, and guiding children's interactions and relationships (Curby, Brock, & Hamre, 2013; Merritt, Wanless, Rimm-Kaufman, Cameron, & Peugh, 2012). Importantly, decisions regarding young children's need for interventions targeting social skills and peer interactions and/or relationships are frequently based on teachers' reports.

However, teachers' reports reflect an outsider's view of children's peer group experiences (Wu et al., 2001) and their judgements might be constrained by (a) lack of access to peer-related incidents they do not witness (Smith, 2015) and (b) other visible and immediate events in peer transactions, such as the presence/absence of aggression. Indeed, teachers might not have access to more subtle transactions between young children, and their reports might be influenced by variables such as academic abilities and behaviors toward the teacher and peers (Shin, Kim, Goetz, & Vaughn, 2014). For example, McMullen et al. (2013) found that children's behavior problems are not *per se* a motive for peer rejection, although teachers

tend to perceive rejection as a consequence of children's behavior. Importantly, peer nominations are a direct indicator of children's actual sociometric popularity based on the individual experiences and preferences of multiple informants while teachers can only provide their own perspective on who is (dis)liked within the peer group.

The number of studies analyzing the association between peer and teacher assessments of sociometric popularity is very limited (Cillessen & Marks, 2011). Those available targeted mostly elementary age or older children (e.g., Renk & Phares, 2004; Wu et al., 2001). Importantly, the two most recent studies available on this topic (Andrade et al., 2005; Berg, Lansu, & Cillessen, 2015) found only moderate associations between reports by teachers and peers in elementary school. Specifically, Andrade et al. (2005) reported that the proportion of elementary school children assigned to popular and average status by teachers was similar to the proportion obtained through the standard method based on peer nominations, (i.e., Coie et al., 1982). That is, they reported that about 15.4% of the class was rated as popular and 65.5% was rated as average (vs. 15% and 55% respectively, based on peer nominations; Cillessen, 2011). However, the proportion of children classified by teachers as rejected (1.8%) or neglected ("ignored", 3.3%) was lower than the proportion typically classified in the same groups based on peer nominations (i.e., 15% and between 5% and 10%, respectively, based on standard sociometric methods; Cillessen, 2011). In turn, Berg and colleagues (2015) reported 67.8 % agreement between peers and teachers on elementary children's popularity. These findings seem to suggest limited correspondence between peer and teachers' perceptions on elementary children's sociometric popularity. Importantly, similar evidence on the sociometric popularity of preschool-aged children is missing, and no study to date has directly compared teacher classifications of peer social status and sociometric status assessed through the standard method most used in the field (i.e., Coie et al., 1982).

Portuguese Preschool System

This study was conducted in Portugal, a Southern European country where preschool education is available for children between 3 years of age and the age of compulsory education (Law No. 5/97). Enrolment in the 1st year of basic education is compulsory for children turning 6 years of age by September 15th. Children who complete 6 years between September 16th and December 31st have conditional access, depending on available vacancies, after priority criteria are applied (Regulatory Order No. 6/2018), and parents' choice.

Preschool provision is supervised by the Ministry of Education, and includes public, private for profit, and private non-profit centers. In 2017/2018, 53.1% of the children attending preschool in Portugal were enrolled in public settings, 30.7% were enrolled in private non-profit settings, and 16.2% were enrolled in for-profit settings (Direção-Geral de Estatísticas da Educação e Ciência, 2018).

Even though preschool education is optional, universal access from the age of 4 is mandated by law (Law No. 65/2015). Coverage rates are relatively high, with approximately 82.8%, 93.1%, and 94% of 3, 4 and 5-year-olds, respectively, currently attending preschool (Direção-Geral de Estatísticas da Educação e Ciência, 2019).

Importantly, the minimum qualification level to lead a preschool classroom in Portugal is a masters' degree in early childhood education (European Commission/EACEA/Eurydice, 2019). In addition, national Curriculum Guidelines for Preschool Education (Lopes da Silva, Marques, Mata, & Rosa, 2016) support teachers across the entire preschool network.

Current Study

This study adds to the limited evidence on the correspondence between teacher and peer-based assessments of preschool-aged children's sociometric popularity within the peer group (see Cillessen & Marks, 2011). Specifically, we investigated the associations between young children's sociometric popularity based on teachers' classifications (Andrade et al., 2005), and sociometric popularity based on peer nominations, relying on the standard and

most commonly used method for assessing sociometric status (i.e., Coie et al., 1982). We argue that peer nominations are direct and unique sources of information regarding children's likeability within the peer group and, therefore, not easily replaced by teachers' reports. Therefore, if any, we expected to find only limited agreement between teacher and peer classifications of young children's sociometric popularity.

We also aimed to analyze the associations between sociometric popularity (obtained from teachers and peers) and children's characteristics such as sex, age, behavior problems, social skills, and verbal competence. We expected that *popular* children, based on both sources, were older, had better social skills and verbal competence, and were most likely girls. Further, we expected that *rejected* children, based on both sources, had more behavior problems, showed lower social skills and verbal competence, and were mostly boys. Finally, we analyzed the association between sociometric popularity and parental education, hypothesizing positive associations.

Methods

Participants

A total of 1535 children (731 girls and 804 boys; 86 children with disabilities) aged between 34 and 89.6 months (M = 61.96, SD = 8.91) participated in this study. These children were involved in the individual sociometric interviews required for this study, representing an average of 82.12% (SD = 12.31) of all children across participating classrooms.

From this sample, we randomly selected 4 typically developing children (2 boys and 2 girls) in each classroom for additional assessments. This resulted in a subsample of 352 children (177 girls) ranging from 43.70 to 79.40 months (M = 65.22, SD = 7.36). Children with disabilities were not included in this study. Regarding parents' education, a considerable percentage completed 12 years of education (27.5% of fathers, 29.6% of mothers) or a college degree (16.3% of fathers, 24.5% of mothers).

These children attended 89 preschool classrooms from 40 preschools in the metropolitan area of Lisbon: 25 preschools within public school clusters, 10 private non-profit preschools, and 5 private for-profit preschools. Most classrooms were mixed-age (84.3 %), including children between 3 and 6 years of age. Eight classrooms had 5- and 6-year-olds only, and six classrooms 4-years-old only. Group size ranged between 14 and 27 children (M = 21.21, SD = 2.55). Each classroom had a lead teacher with a university degree in early childhood education and, at least some of the time, a teacher's assistant. Only the lead teachers (N = 89) participated in this study. All teachers, but one, were female, with a mean age of 46.51 (SD = 8.50) and an average of 21.18 years of teaching experience (SD = 7.96).

Procedure

This study was approved by the General-Directorate of Education and the National Data Protection Authority. All the public-school clusters in the metropolitan area of Lisbon were invited to participate as well as private for-profit and non-profit centers identified by local early childhood intervention teams.

The metropolitan area of Lisbon is a littoral territory, composed mostly of urban and semi-urban areas, that concentrate almost a quarter of the Portuguese population (AML, 2019) and 50.5% of the foreign population with legal resident status (PORDATA, 2019). This region contributes to over 36% of the national GDP (AML, 2019) and has the lowest at-risk-of-poverty rate in Portugal (Instituto Nacional de Estatística, 2019). Its preschool coverage rate is 81.8% (vs. a national preschool coverage rate of 90.1%) (Direção-Geral de Estatísticas da Educação e Ciência, 2019).

Selection criteria required that (a) each classroom had at least one child with disabilities, to address research questions not included in this paper; (b) most children in the classroom had 4 and/or 5 years, to maximize the reliability of the sociometric reports by children;

and (c) at least 60% of all classroom children returned signed consent forms for the sociometric interviews. Once the schools/centers were selected, teachers and researchers met for discussing study goals and procedures. Detailed consent forms, including letters addressed to the families, were distributed. Once the required consent forms were returned, data collection began.

Sociometric popularity data were collected between February and April (at least five months after the beginning of the school year) and all assessments took place in the centers in a quiet meeting room made available by school staff. For the four focal children in each classroom, individual assessments of verbal competence were conducted by trained researchers with a master's degree in psychology. Sociometric interviews were conducted individually with all children with signed consent, typically over 80% of all children in the classroom. The interviews, paper and audio recorded, were introduced as a game with classmates' pictures. Confidentiality was emphasized. Overall, individual child interviews took between 10 to 15 minutes. After data collection, all pictures were destroyed.

Measures

Sociometric nominations. We conducted individual interviews to obtain peer sociometric nominations (McCandless & Marshall, 1957) from which social preference, social impact, and sociometric status were computed. Researchers placed the pictures of all children on a table (typically, 4 rows with 6 pictures each, in a group of 25 children). Children were asked to name each peer as pictures were placed on the table. They were then asked to choose the peer with whom they *liked to play the most*. The request was repeated two more times to obtain three positive nominations. Next, they were asked to select the peer *they liked to play the least* (repeated twice). As peers were chosen, photographs were removed.

We used peer nominations to compute social preference (P) and social impact (I). Subsequently, we classified children into sociometric status groups, following Coie and colleagues' (1982) procedures, considered the golden standard for assessing sociometric status (Cillessen, 2011). Sociometric nomination procedures have been successfully used with preschoolers, including 3-years-olds (Shin et al., 2014; Szewczyk-Sokolowski, Bost, & Wainwright, 2005; Wu et al., 2001), and preschool children with disabilities (Ferreira, Aguiar, Correia, Fialho, & Pimentel, 2017; Reed, McIntyre, Dusek, & Quintero, 2011). This set of procedures considers the absolute frequencies of positive and negative nominations received by each child, converted into standardized *z* scores. These scores represent the *like most* (LM) and *like least* (LL) measures and are used to calculate *P* (i.e., LM - LL) and *I* (i.e., LM + LL). The final taxonomy is based on the normal distribution and is obtained with the four standardized scores (i.e., LM, LL, P and, I), as follows: *popular children* (P > 1.0, LM > 0 and LL < 0), *rejected children* (P < 1.0, LM < 0 and LL > 0), *neglected children* (I < 1.0, positive nominations absolute frequency = 0), *controversial children* (I > 1.0, LM and LL > 0), *average children* (P and I, between - .0.5 and 0.5); and *other* children, including all children not fitting into the criteria. Despite their relatively low stability, sociometric status groups have demonstrated excellent concurrent validity (see Cillessen, 2011).

Social skills and behavior problems. The Social Skills Rating System (SSRS, Gresham & Elliott, 1990/2007), teacher version for preschool-aged children, was used to assess children's Social Skills and Behavior Problems. For this study, we used 40 items: 30 for the Social Skills scale, and 10 for the Behavior Problems scale. Each item is measured on a 3-point ordinal scale (0 = *Never*, 1 = *Sometimes*, 2 = *Very often*). The authors reported high reliability (internal consistency) for both scales, with an average coefficient alpha of .90 for the Social Skills scale and of .84 for the Behavior Problems scale. In this study, we found similar internal consistency levels: Cronbach's α = .92 and .79 for the Social Skills and the Behavior

Problems scales, respectively. For the Behavior Problems subscales, we found high internal consistency for the externalizing behavior subscale ($\alpha = .86$) but not for the internalizing behavior subscale ($\alpha = .54$).

Teachers' classifications of peer sociometric popularity. Teachers were asked to classify each child into one of five peer sociometric groups: (a) *the child is actively rejected by peers*; (b) *the child is simply ignored by peers*; (c) *the child is actively rejected by some peers but is popular with other peers*; (d) *the child is average in peer popularity*; and (e) *the child is high in peer popularity.* This classification is included in the Nova Scotia Modified IOWA Conners (NSIC; Goyette, Conners, & Ulrich, 1978; Milich, Loney, & Landau, 1982; see Andrade et al., 2005), a scale widely used to assess children's behavioural problems. Andrade et al. (2005) reported preliminary date supporting the validity of this classification in elementary school-aged children. Specifically, Andrade and colleagues (2005) reported differences among social status groups on positive peer nominations, with rejected, neglected (i.e., "ignored"), and controversial children receiving fewer positive peer nominations than average and popular children.

Children's language competence. Children's language competence was assessed using the Wechsler Intelligence Scale for Children (WPPSI-R, Wechsler, 2003). The WPPSI-R is appropriate for assessing children aged between 3 to 7. This test, individually applied to children, includes a total of 12 subtests, grouped in two sub-scales: (1) performance and (2) verbal. For the purposes of the present study, the verbal scale was used.

Demographics. Teachers filled in a questionnaire on their age, education, and experience, type of center (i.e., public, private for-profit, and private non-profit), group size, children's age, and parents' education.

Analyses

We computed independence chi-square tests to examine: (a) the association between

children's sociometric groups, derived from peer nominations and teachers' classifications; and (b) the association between both classifications of sociometric popularity and children's sex and parent's education. We also conducted *one-way* ANOVA tests to examine if children in different sociometric groups, based on teachers' classifications and peer nominations, differed in selected individual characteristics, including age, behavior problems, social skills, and verbal competence. Cohen's *d* was computed to provide effect size estimates. Due to extremely low counts, children classified by teachers and peers as neglected or rejected were clustered in one group for computation of chi-square tests. Parents' education was coded into three levels: *low* = less than nine years of education, *middle* = more than nine and less than 15 years of education, and *high* = more than 15 years of schooling. Teachers classifications of sociometric popularity were missing for nine children and peer nominations were missing for one child, accounting for small differences in reported samples sizes across analyses.

Results

Children's Sociometric Popularity Based on Reports by Teachers and Peers

Table 1 presents the means and standard deviations for all variables. A Chi-square test was performed to examine the independence of sociometric popularity obtained from teachers' classifications and peer nominations. Because 30% of cells had an expected count below 5, a Monte Carlo simulation was used (Marôco, 2011; Steele & Douglas, 2006). Results indicated that sociometric popularity obtained from teachers' classifications and peer sociometric nominations were not independent, $\chi^2(12) = 41.93$, $p < .001$, $n = 342$, but the strength of the association was weak (Cramer's $V = .202$, $p < .001$). As presented in Table 2, only 10 children (2.9%) were classified as either rejected or neglected by teachers, compared with 85 (28.8%) classified as rejected and 8 (2.3%) classified as neglected, based on peer nominations. In addition, 54 children (15.8%) were classified as popular based on peer nominations, whereas 122 (35.7%) were classified as popular by teachers.

Sociometric Popularity Reported by Teachers and Children's Characteristics

Teachers' classifications of children's sociometric popularity were not associated with children's sex, $\chi^2(5) = 2.258$, $p = .812$, nor with parental education, $\chi^2(6) = 7.438$, $p = .282$, for mothers; $\chi^2(6) = 9.594$, $p = .143$, for fathers. However, as presented in Table 3, children classified by teachers as popular, controversial, average, or rejected/neglected differed on age (F (3,339) = 3.645, $p = .013$), social skills (F (3,339) = 39.830, $p < .001$), behavior problems (F (3,339) = 9.861, $p < .001$), including externalizing (F (3,339) = 8.485, $p < .001$) and internalizing behaviors (F (3,339) = 14.541, $p < .001$), and verbal competence (F (3,339) = 3.812, $p = .010$).

Post-hoc analyses (*Hochberg* test, for homogeneous variances; *Games-Howel*, when the homogeneity assumption was not met) indicated that controversial children were younger than popular children ($p = .044$, $d = 0.43$). Rejected/neglected and controversial children did not differ on their social skills ($p = .556$, $d = 0.47$), but all other groups did ($p < .001$, *ds* between 0.76 and 1.92), with popular children showing significantly higher social skills levels than all others. Rejected/neglected children presented higher levels of internalizing behaviors than all other groups ($p = .005$, d between 1.22 and 1.96). Controversial children exhibited higher levels of externalizing behavior than average and popular children ($p = .001$, $d = 0.70$; $p = .008$, $d = 0.39$, respectively); average children presented lower levels of externalizing behavior than popular children ($p = .023$, $d = 0.36$). Popular children had higher verbal competence scores than controversial and average children ($p = .017$, $d = 0.49$; $p = .024$, $d = 0.34$, respectively).

Sociometric Popularity Based on Peer Nominations and Children's Characteristics

Classifications of children's sociometric popularity based on peer nominations were not associated with children's sex, $\chi^2(3) = 1.649$, $p = .648$, nor with parents' education, $\chi^2(8) = 10.157$, $p = .254$, for mothers, $\chi^2(8) = 6.157$, $p = .590$, for fathers. As presented in Table 4,

differences between sociometric groups based on peer nominations were found for social skills (F (5,345) = 5.779, $p < .001$), behavior problems (F (5,345) = 4.082, $p < .001$), both internalizing (F (5,345) = 3.492, $p = .004$) and externalizing behavior (F (5,345) = 2.556, $p = .027$), but not for age nor verbal competence. The *Games-Howell* test was used for *post-hoc* analyses. Results indicated that rejected children had lower social skills than popular, average, and controversial children ($p < .001$, $d = 0.76$; $p = .004$, $d = 0.71$; and $p = .011$, $d = 0.74$, respectively). Rejected children presented more behavior problems than average and controversial children ($p = .018$, $d = 0.57$; and $p = .002$, $d = 0.79$, respectively). Rejected children had more internalizing behavior problems than controversial children ($p < .001$, $d = 0.95$). No significant differences were found in the post-hoc tests for externalizing behavior problems.

Discussion

This study investigated the associations between children's sociometric popularity obtained from teacher and peer reports. Differences between sociometric groups obtained from the two sources, on individual child characteristics such as sex, age, social skills, behavior problems, verbal competence, and parents' education, were also examined.

Sociometric popularity estimates based on teachers' classifications and peer nominations were not independent. However, similar to Andrade et al. (2005) and Berg et al. (2015), the strength of the association was weak, and the two methods resulted in relatively different pictures of individual children's likeability within the peer group. Previously, within the same research project that originated this study and using similar methods, Ferreira et al. (2017) reported that classifications of peer sociometric popularity of preschool children with disabilities based on teacher and peer reports were, in fact, independent. As in previous studies (e.g., Andrade et al., 2005; Ferreira et al., 2017; see also Cillessen, 2011), teachers held a more po-

sitive view of children's social experiences, perceiving only a small number of children as rejected by their peers.

Different reasons may be considered for these different perspectives. First, teachers' classifications may be biased by social desirability, with teachers likely feeling compelled to provide a positive assessment of individual children's sociometric popularity within the group, perhaps considering that children's likeability reflects positive classroom experiences. Second, teachers tend to perceive rejection as a consequence of externalizing behaviors (Gifford-Smith & Brownell, 2003) and children participating in this study had low levels of behavior problems. Third, even though some children are doing less well in the network of peer interactions and relationships, based on low peer likeability, they may still have positive social experiences in the group, namely by establishing and maintaining one or two close friends. Conversely, their teachers may be able to identify and value these positive experiences and, therefore, may not classify such children as rejected or neglected. It is also possible that participating teachers did not wish to label children as rejected or neglected but would be apt to rate them on the behavior characteristics associated with different social status groups.

Prior studies have supported the notion that teachers are a valid source of information regarding children's behavior problems, in particular, aggressive behaviors (Huesmann, Eron, Guerra, & Crawshaw, 1994) and are able to distinguish rejected children from all other sociometric groups (Nelson et al., 2009), probably because rejected children tend to display higher levels of behavior problems. Our findings, however, suggest that teachers identify few rejected children when using a classification method that relies on a global assessment of children's sociometric popularity within the preschool peer group. Based on these findings, it is possible that methods based on peer nominations are more sensitive for identifying young children experiencing rejection within the peer group, while teachers may be more willing to

identify popular children. Indeed, some methods may be more appropriate for identifying certain types of characteristics and experiences than others and their validity and reliability may vary across age groups. Leff and colleagues (1999), for example, found that the use of multiple teachers' reports (with elementary and middle school children) resulted in better identification of aggression and victimization (especially for elementary school children) than the use of a single teacher per classroom. Monks and Smith (2010) used peer, self, and teacher nominations of participant roles in peer victimization (in 5- and 8-year-olds) and found better agreement between peer and teacher reports than with self-nominations. Huesmann et al. (1994) tested teachers' predictions on how elementary school children perceived their peers, rather than asking for their views. This method resulted in valid and highly reliable scores and was a better predictor of peer aggression than teachers' ratings of aggressive behavior. In turn, Ladd and Kochenderfer-Ladd (2002) tested cross-informant measures of peer victimization and found that, between grades 2 to 4, data from self, peer, teachers, and parents were reliable and increasingly concordant over time. Moreover, no single informant measure was found to be the best predictor of relational adjustment and no single measure resulted in better estimates of relational adjustment than a multi-informant composite.

Consistent with prior research, and confirming our hypotheses, children classified as popular by their teachers were older and had better social (Eisenberg, Spinrad, & Knafo-Noam, 2006) and verbal (Hartas, 2011) skills. These results support the notion that sociometric popularity is associated with children's social competence. It is likely that the effects are reciprocal, with social skills contributing to increased sociometric popularity, via higher-quality peer interactions and relationships, and sociometric popularity subsequently shaping children's peer-related social experiences (Coie, 1990; Ladd, 2006). Similar to other studies (e.g., Morais et al., 2001; Rubin et al., 2006), children in the controversial group exhibited hi-

gher levels of externalizing behaviors and children in the rejected group displayed higher levels of internalizing behaviors, even though the level of behavior problems for participating children was generally low.

Contrary to our hypotheses and previous research (e.g., Morais et al., 2001), no associations between children's sex, parental education, and social status based on teachers' classifications were found. When considering peer nomination data, the pattern of findings was similar, except for differences regarding children's age and verbal competence. In this case, contrary to our expectations, different sociometric groups did not differ as a function of children's age and verbal competence. Based on these findings, it appears that social skills and behavior problems inform both teacher and peer perspectives, while other characteristics such as children's age and verbal competence seem to be more salient for teachers than children when reporting on individual children's sociometric popularity. Shin et al. (2014) also reported that variables such as academic abilities and behaviors toward the teacher and peers influenced teachers' classifications. Sociometric popularity based on peer nominations might reflect, to a greater extent, variations on proximal predictors of the quality of social exchanges such as the strategies children use to reach their social goals or their conformity to group behavior norms (Rubin et al., 2006). Importantly, cognitive biases and social goals also may partially explain these differences, with children attending to factors that facilitate social interactions and teachers attending to factors involved in social regulation (see Smith, 2015). Nevertheless, it is meaningful that sociometric status groups based on peer nominations as well as teachers' classifications differed on behavior problems and social skills as reported by teachers, reflecting the validity of teachers' behavioral reports (Gresham & Elliott, 1990; van Lier et al., 2012).

Strengths, Limitations, and Future Research

In addition to addressing a relevant research question, this study had important strengths, namely (1) its focus on the preschool period, which has been somewhat neglected in extant studies focusing on this topic; (2) the use of a well-established measure of sociometric popularity, based on peer nominations; and (3) the use of a considerable sample size from a European country. However, some limitations need to be considered and discussed.

The measures used to capture teacher and peer reports of children's sociometric popularity are distinct in their nature, limiting comparisons of data obtained from both sources. Indeed, while sociometric popularity computed from peer nominations is based on the individual experiences and preferences of multiple informants, teachers' classifications are based on a global assessment of the likeability of each child within the peer group, from the perspective of a single outsider informant. Future research could rely on more comparable methods of assessing sociometric popularity, by asking teachers to identify, for each focal child, which classmates are most and least liked. Further, including additional informants such as other adults with whom children interact daily in the preschool context, could help address the limitations resulting from using brief reports by a single teacher (vs. all peers in the classroom). Prior studies do support the use of reports by multiple teachers (e.g., Leff, Kupersmidt, Patterson, & Power, 1999). Therefore, additional research based on multiple informants and multi-methods (e.g., adding behavior observations) would be valuable. In addition, future studies could include a measure of teacher-child relationship quality or teacher preferences to investigate potential associations with teacher's perceptions of individual children's sociometric popularity.

Similar to Andrade et al. (2005), we did not provide teachers with detailed descriptions on each of the five sociometric groups (i.e., popular, rejected, average, controversial, and neglected). Even though the labels of each social status type were easily grasped by teachers, future studies could provide such descriptions. In addition, prompting teachers to classify

children's social status based on the perspective of their peers might result in higher agreement with sociometric popularity based on peer nominations (Huesmann et al., 1994). Test-retest procedures to check the stability of teachers' classifications would also be useful.

In addition, although we interviewed most children in each classroom (over 80%, on average), we only collected data on individual children's characteristics for a subsample of 4 randomly selected children. While this option reduced the burden on teachers and required fewer resources, future studies including more children from each classroom could find more children falling in the less frequent sociometric groups, such as the neglected group of children.

Importantly, while we used the conventional criteria proposed by Coie et al. (1982) to obtain children's sociometric status from peer nominations, we acknowledge measurement issues as this method does not result in the classification of all children and it proposes a strict criteria to identify neglected children (i.e., positive nominations absolute frequency = 0), likely underestimating the number of children in this sociometric group. Still, for the purposes of this study, the use of a standard and substantially used and tested method was considered an important strength. Finally, our cross-sectional correlational research design precludes any cause-effect inferences.

Conclusions and Implications

This study answered Cillessen and Marks's (2011) call for research "on the correspondence between teacher and peer assessments of acceptance and popularity" (p. 48). According to our findings, even though sociometric popularity based on teachers' classifications and peer nominations was not statistically independent, teachers and children report substantively distinct perspectives of what was going on in the social fabric of children's daily interactions and relationships. Teachers´ classifications of peer sociometric popularity resulted in

more positive snapshots of children's likeability within the peer group. These findings suggest that teachers overestimate the social status of young children and, thus, may not identify some of the children who are experiencing rejection and neglect within the peer group. This overestimation of social status could have implications for teachers' decisions to design and implement specific interventions targeting those children or to search for additional supports, namely those provided by early childhood intervention services. Therefore, if teachers' perspectives alone are considered for intervention eligibility purposes, some children may go under the radar, eventually failing to receive intervention that minimizes potentially negative social outcomes.

It is noteworthy that these findings were obtained in a sample composed exclusively of preschool teachers with a university degree in early childhood education, as mandated by Portuguese law. Clearly, investments in continuous professional development are, nevertheless, warranted. Our findings suggest the need for specific training to improve teachers' knowledge about classroom social dynamics and about factors that could increase the likelihood of a child developing towards an unadjusted path resulting in the negative and long-lasting outcomes associated with social maladaptation (Dishion & Patterson, 2006; Parker et al., 2006).

Overall, findings provide limited support to the use of teachers' classifications as an alternative to or a replacement of sociometric popularity obtained from peer nominations. Instead, teachers' classifications may provide a complementary perspective on young children's likeability within the peer group. However, more studies investigating the associations between teacher and peer perspectives are necessary to understand how and to what extent teachers' reports add to children's perspectives.

As actors in the complex structure of the peer group, children are natives to this territory and, therefore, the owners and judges of peer likeability. We should, indeed, ask children first

and foremost, with the certainty that consulting children to appropriately portray their social experiences has irreplaceable value.

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Table 1

Means, Standard Deviations, Maximum and Minimum for the Study Variables (N = 352)

Variable	*M*	*SD*
Age (months)	65.12	7.60
Social skills	1.49	0.31
Behavior problems	0.42	0.35
Externalizing	0.52	0.50
Internalizing	0.28	0.34
Verbal competence	10.53	2.20

Table 2

Social Status Classifications Based on Teachers Report and Children Peer Nominations

		Teachers report			
		Popular	Controversial	Average	Rejected & Ne
Peer nominations	Popular	**29**	2	23	0
	Controversial	17	**3**	8	0
	Average	21	4	**16**	1
	Rejected	16	18	45	**6**
	Neglected	1	4	3	**0**
	Other	38	25	59	3
	Total	122	56	154	10

Table 3

One-way Variance Analyses Testing Differences Between Social Status Based on Teacher Classifications on Child Individual Characteristics

	Popular (n = 122)		Controversial (n = 57)		Average (n = 154)		Rejected (n = 10)
Child characteristics	M	SD	M	SD	M	SD	M
Age	66.72	7.20	63.58	7.41	64.68	7.22	61.96
Social skills	1.67	0.23	1.25	0.28	1.47	0.29	1.10
Behavior problems	0.41	0.34	0.62	0.42	0.34	0.31	0.60
Externalizing	0.56	0.47	0.77	0.61	0.40	0.43	0.47
Internalizing	0.19	0.29	0.39	0.34	0.26	0.33	0.80
Verbal competence	11.06	1.82	10.11	2.05	10.34	2.40	9.93

Note. $*p \leq .05$. $**p \leq .01$. $***p \leq .001$.

Table 4

One-way Variance Analyses Testing Differences Between Social Status Based on Peer Nominations on Child Individual Characteristics

	Popular (n = 58)		Rejected (n = 86)		Controversial (n =28)		Neglected (n = 9)		Average (n = 45)		Other (n = 125)		
Child characteristics	M	SD	M	SD	M	SD	M	SD	M	SD	M	SD	F
Age	66.40	7.43	64.09	7.34	65.77	7.09	64.45	5.50	64.95	7.71	65.53	7.41	.805
Social skills	1.58	0.24	1.37	0.31	1.59	0.28	1.33	0.25	1.59	0.31	1.49	0.32	5.779***
Behavior problems	0.38	0.35	0.55	0.41	0.27	0.29	0.38	0.30	0.35	0.28	0.41	0.32	4.082***
Externalizing	0.47	0.47	0.67	0.57	0.39	0.43	0.50	0.43	0.42	0.41	0.49	0.47	2.556*
Internalizing	0.24	0.36	0.37	0.38	0.09	0.17	0.19	0.21	0.24	0.32	0.29	0.32	3.492**
Verbal competence	10.72	2.32	9.99	2.31	10.71	2.18	9.83	1.21	11.05	1.80	10.68	2.19	2.010

Note. *$p \leq .05$. **$p \leq .01$. ***$p \leq .001$.