TEACHER-CHILD INTERACTIONS, DISABILITY PROFILE, AND SOCIAL EXPERIENCES OF CHILDREN IN INCLUSIVE PRESCHOOL CLASSROOMS

Milene Alexandra Gregório Ferreira

Tese submetida como requisito parcial para obtenção do grau de

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Palavras-chave:

Crianças com incapacidades; relações sociais; interações educadora-criança; competências sociais

Key words:

Children with disabilities; social relationships; teacher-child interactions; social competence

Categorias de Classificação da tese

(PsycINFO Classification Categories and Codes)

3500 Educational Psycology

3560 Classroom Dynamics & Student Adjustment & Attitudes

3570 Special & Remedial Education

2800 Developmental Psychology

2840 Psychosocial & Personality Development

RESUMO

Em Portugal, quase todas as crianças com incapacidades encontram-se a frequentar contextos de educação pré-escolar regular, tornando-se fundamental promover a sua inclusão de uma forma que potencie o seu desenvolvimento global, bem como o desenvolvimento de sentimentos de pertença, relações sociais positivas e amizades. De facto, recentemente, o desenvolvimento socio-emocional e comportamental das crianças com incapacidade foi considerado um objetivo crucial de uma inclusão de elevada qualidade na infância (DEC/ NAEYC, 2009).

Composta por três estudos, a presente dissertação tem por objetivo alargar o conhecimento existente acerca das experiências sociais das crianças com incapacidades que frequentam contextos de educação pré-escolar e da forma como as suas características individuais e a exposição ao contexto, considerando quer a qualidade das interações educador-criança quer e o tempo de exposição a essas interações, influenciam o estabelecimento de relações sociais e o seu desenvolvimento social. Neste estudo, participaram um total de 86 crianças com incapacidades (63 rapazes) com idades que variavam entre os 45 e 88 meses (M = 67.53, DP = 10.54), frequentando 86 jardins-de-infância inclusivos da área metropolitana de Lisboa, bem como os seus respetivos educadores de infância. O primeiro estudo permitiu descrever as experiências sociais das crianças com incapacidades ao nível das relações diádicas e ao nível do grupo, identificando características individuais e perfis de funcionalidade que dificultam a inclusão social. No segundo estudo, procurou-se compreender em que medida as características das crianças associadas a maior risco de exclusão social e as características dos contextos que parecem ser protetoras, como a qualidade das interações educador-criança (e.g., Burchinal et al., 2010), influenciam as suas experiências sociais e como esta relação é moderada pelo tempo de exposição. Por fim, no terceiro estudo, analisou-se o papel moderador da qualidade das interações educador-criança e do tempo de exposição na relação entre o grau de incapacidade das crianças e as suas competências sociais e comportamentais.

Os resultados encontrados evidenciam que as crianças com perfis de incapacidade mais graves e que revelam dificuldades socio-comportamentais apresentam um maior risco de exclusão social, verificando-se que os seus educadores de infância poderão não identificar processos de rejeição destas crianças, colocando em causa a sua inclusão social. Crianças com dificuldades comportamentais e baixa competência verbal parecem revelar mais dificuldades em termos de inclusão social quando têm níveis superiores de exposição, ou seja, quando faltam menos dias. A qualidade das interações educador-criança não parece ter um impacto direto nas experiências sociais das crianças; contudo, parece moderar a associação entre o grau de incapacidade das crianças e os seus problemas de comportamento, tendo a baixa qualidade um impacto negativo nos comportamentos das crianças com incapacidades mais ligeiras.

Com base nestes resultados, importa no futuro apoiar os educadores no desenvolvimento de competências de identificação de processos de rejeição e exclusão de crianças com incapacidade pelos seus pares, bem como na implementação de estratégias ativas que promovam o envolvimento das crianças com incapacidade em interações de elevada qualidade, potenciando o desenvolvimento das suas competências e relações sociais. Por outro lado, a simples permanência das crianças com comportamentos desafiantes e menos competências de linguagem em contextos inclusivos parece não ser suficiente para assegurar a sua inclusão social, sendo importante implementar intervenções específicas que promovam, efetivamente, as suas competências socio-comportamentais.

ABSTRACT

In Portugal, almost all children with disabilities attend regular preschool classrooms. Therefore, it is crucial to promote their inclusion ensuring their global development, as well as the development of a sense of belonging, positive social relationships, and friendships. Indeed, recently, the socio-emotional and the behavioral development of children with disabilities was considered a critical goal of high-quality early childhood inclusion (DEC/ NAEYC, 2009).

Constituted by three studies, the present dissertation aims to extend the existing knowledge on the social experiences of children with disabilities who attend inclusive early childhood education and care (ECEC) settings and on how their individual characteristics and exposure to context, specifically the quality of teacher-child interactions and the amount of their exposure, influence the development of social relationships and social development. In this study, participated a total of 86 children with disabilities (63 boys), aged between 45 and 88 months (M = 67.53, SD = 10.54) from 86 inclusive preschool classrooms from the metropolitan area of Lisbon, as well as their respective teachers. The first study aimed to describe the social experiences of children with disabilities in terms of dyadic relationships and group level experiences, identifying individual characteristics and functional profiles that hinder their social inclusion. In the second study, we sought to understand to what extent children's characteristics associated with a higher risk of social exclusion and context characteristics that seem to be protective, as the quality of teacher-child interactions (e.g., Burchinal et al., 2010), influence their social experiences and how this association is moderated by their exposure. Finally, in the third study, we analyzed the moderating role of teacher-child interactions quality and dosage in the associations between children's degree of disability and their social and behavioral competences.

Findings showed children with more severe disabilities, and children who revealed socio behavioral difficulties present a higher risk of social exclusion, while suggesting their teachers may not be aware of processes of social rejection, jeopardizing their social inclusion. Children with behavior difficulties and low verbal competence seem to have more social inclusion difficulties, when they have higher levels of dosage, that is, when they miss more school days. Teacher-child interactions quality does not seem to have a direct impact on children's social experiences; however, it does seem to moderate the association between the children's degree of disability and their problem behaviors, with lower quality having a negative impact on the behavior of children with mild disabilities.

Based on these findings, it is important to support early childhood education teachers' in identifying processes of social rejection and exclusion of children with disabilities by their peers, as well as in implementing active strategies that promote the involvement of children with disabilities in high-quality interactions, enhancing the development of their competences and social relationships. On the other hand, the simple exposure of children with challenging behaviors and less verbal competences to inclusive settings does not seem to be sufficient to ensure their social inclusion, and the implementation of specific interventions to effectively promote their social-behavioral skills seems necessary.

TABLE OF CONTENTS

INDEX OF TABLES

INDEX OF FIGURES

CHAPTER I

General Introduction

> Today an ever-increasing number of infants and young children with and without disabilities play, develop, and learn together in a variety of places – homes, early childhood programs, neighborhoods, and other community-based settings. The notion that young children with disabilities and their families are full members of the community reflects societal values about promoting opportunities for development and learning, and a sense of belonging for every child. (DEC/ NAEYC, 2009, pp. 1)

In Portugal, about 99% of children with disabilities attend classrooms in regular schools (Direção-Geral de Estatísticas da Educação e Ciência, 2016). According to DEC/ NAEYC (2009), early childhood inclusion has to ensure that every child, with and without disabilities, participates in a wide variety of contexts and activities, achieving his/her potential. Furthermore, developing a sense of belonging, positive social relationships, and friendship are critical goals for high-quality early childhood inclusion.

Positive social outcomes (e.g., having a friend) have been identified for young children with disabilities attending inclusive preschools (Buysse, Goldman, & Skinner, 2002). However, globally, research reports high levels of social rejection (Odom et al., 2006) and few friends for children with disabilities (Guralnick, Gottman & Hammond, 1996), especially for children with decreased peer-related social competence (Meyer & Ostrosky, 2016). Portuguese preschool children with disabilities also seem to experience difficulties in social interactions with peers, spending more time alone, isolated, than children without disabilities (Gamelas, 2003). Further, previous research findings suggest older Portuguese children and with less severe disabilities are at higher risk of social rejection (Aguiar, Moiteiro, & Pimentel, 2010).

In inclusive preschool classrooms, children with and without disabilities play together, developing social relationships, and it seems that they experience higher levels of global quality than children enrolled in non-inclusive classrooms (Grisham-Brown, Cox, Gravil, & Missall, 2010). Interactions between teachers and children in inclusive classrooms also seem to be of higher quality and more developmentally appropriate (Hestenes, Cassidy, Shim, & Hedge, 2008). Further, children with disabilities seem to have good-quality individual experiences in inclusive settings, based on positive teacher-child relationships (Jeon et al., 2010). Harmonious, stimulating, and warm

classrooms that provide emotional support, create an environment where children feel safe and seek the teacher as a source of support, promoting children's connections (Downer, Sabol, & Hamre, 2010). Classrooms with high-quality teacher-child interactions have been associated with positive socio-emotional developmental outcomes for children without disabilities, including children from disadvantaged backgrounds (Howes, 2011; Mashburn et al., 2008). However, few studies have looked into these associations among children with disabilities.

The present work is part of a broader project entitled "Enhancing peer relationships: Preschool teachers' ideas and practices", funded by Fundação para a Ciência e a Tecnologia (PTDC/CPE-CED/117476/2010), that aims to (a) understand the ideas of Portuguese preschool teachers about what is important to promote children's relationships; (b) document the strategies that teachers use towards this goal, investigating the relationship between teachers' ideas and practices and the social participation of children with and without disabilities; and (c) investigate whether children's ability profiles influence the associations between teachers' practices and children's social participation experiences. The specific contribution of this particular work is the focus on the social experiences of children with disabilities and on the role of teacher practices, specifically, teacher-child interactions, on the social outcomes of this specific group of children.

In general, this work aims to investigate the social experiences of children with disabilities at the dyadic and group level, as well as to identify individual characteristics and classroom features that enhance or hinder their social inclusion. In inclusive classrooms, teacher practices may influence children's social competence and relationships. Therefore, the quality of teacher-child interactions and its associations with children's social experiences are examined in this study. More specifically, this work aims to (1) identify disability profiles with increased risk of social rejection and exclusion; (2) investigate teachers' awareness of social exclusion and rejection processes experienced by children with disabilities; (3) investigate the associations between early childhood education and care (ECEC) dosage and children's friendships, social acceptance, and socio-behavioral competence; (4) investigate the associations between teacher-child interactions and children's friendships, social acceptance, social skills, and problem behaviors. To this effect, a set of three studies are presented and

discussed in this dissertation, trying to increased available information on children's social experiences and identifying potential areas of intervention.

This work examines children's social development outcomes building on the bioecological theory of human development (Bronfenbrenner & Morris, 2006). According to this theoretical framework, human development can be better understood on the basis of a process-person-context-time model; more specifically, development results from processes that involve dynamic interactions between a developing individual and the persons, objects, and symbols within a context, during a period of time. Processes are one of principal components of this model and are also known as proximal process. Their impact on human development varies as a result of the characteristics of the developing person, his/her contexts (immediate or remote environment), and time (for example, frequency, duration). These processes occur within a microsystem. Microsystems are the immediate environment with specific physical, social, and symbolic characteristics, where the developing person experiences interpersonal relations, social roles, and activities that enhance or hinder his/her involvement in interactions with increased complexity over time (Bronfenbrenner, 1994). Children's preschool settings are important microsystems, where development occurs. This work studies the associations among the individual characteristics of children with disabilities (i.e., personal characteristics), their interactions with peers, classroom-level teacher-child interactions (proximal processes), and children's social outcomes, within a specific microsystem, the preschool setting, while considering the impact of time on these processes.

Social Experiences of Children with Disabilities in Inclusive Classrooms

Inclusive preschools, a natural environment with children without disabilities, who may be more available for interactions, seem to enhance the opportunities for children with disabilities to develop friendships, a specific type of relationships which are dyadic, reciprocal, and voluntary (Buysse et al., 2002; Goldman, 2007; Rubin, Bukowski, & Parker, 2006). Despite findings suggesting positive effects of inclusion for children with disabilities (Buysse et al., 2002), most of them seem to be at risk of social exclusion (Odom et al., 2006). As described above, personal characteristics influence proximal processes (Bronfenbrenner & Morris, 2006) and, consequently, their desired outcomes. Depending on the type of disability, children present specific characteristics that can influence their play activities and interactions with other children, which are

indicators of young children's social relationships, such as friendship (e.g., Dietrich, 2005; Hollingsworth & Buysse, 2009).

Research suggests some individual characteristics of children with disabilities are related to having fewer friends, including type of diagnosis (Buysse, 1993), developmental status (Guralnick et al., 1996), developmental age (Buysse, 1993), and socio-behavioral competence (Meyer & Ostroky, 2016). Children with language disabilities are more likely to have at least one friend when compared to children with developmental delay or cognitive disabilities (Buysse, 1993; Guralnick et al., 1996). Further, children with more social skills and less problem behaviors (Meyer & Ostrosky, 2016) are more likely to have friends. It is not clear if gender is related to friendship. Preschool children tend to form same gender friendship dyads (Vaughn, Colvin, Azria, Caya, & Krzysik, 2001) and it seems that it is more likely that a girl chooses a peer with disabilities to play with (Diamond, Hong, & Tu, 2008), which may suggest that boys with disabilities have an increased risk of social exclusion. Therefore, this issue needs further investigation.

Children's characteristics also seem to influence their inclusion at a higher level of social complexity, the group level. Research on the social acceptance of children with disabilities suggests the severity of disability (Aguiar et al., 2010) and type of disability (Odom et al., 2006) are related to levels of social acceptance and rejection. Disabilities that influence children's socio-behavioral competence, such as intellectual disabilities and autism-pervasive developmental disorders, appeared more related to social rejection (Meyer & Ostrosky, 2016; Odom et al., 2006). Age also appears to be associated with social acceptance but, in this case, chronological age appears negatively associated with the acceptance of children with disabilities (Aguiar et al., 2010).

Also at the group level, sociometric status may be an indicator of children's social impact and preference. Peer sociometric nominations can be used to determine five independent social statuses: popular, rejected, neglected, average, and controversial (Coie, Dodge, & Coppotelli, 1982). Knowing each child's social status helps to identify processes of social rejection and neglect. Little available research, based on peer report, suggests children with disabilities have more disadvantageous sociometric statuses than their typically developed peers (Ochoa & Olivarez, 1995).

Social networks are useful both to analyze children's social connections within the group, providing information about the structure of the group (Scott, 2009), and to study the influence of the group structure on individuals (Wasserman & Faust, 2009). Group or solitary play are examples "of enduring patterns of proximal process" (Bronfenbrenner & Morris, 2006, pp. 797). For example, being involved in subgroups enhances the opportunities to develop more relationships (Schaefer, Light, Fabes, Hanish, & Martin, 2010). Very limited knowledge exists about the social networks of young children with disabilities. Available research suggests children with sociocognitive disabilities have lower involvement in peer social networks than children with physical disabilities (Aguiar, Pimentel, Moiteiro, Boavida, & Figueiredo, 2011) and older children with high-functioning Autism Spectrum Disorders assume more peripheral positions in the peer group structure (Chamberlain, Kasari, & Rotheram-Fuller, 2007), with more children isolated, and having smaller networks (Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011), than their typically developed peers.

Friendship in inclusive classrooms has been the focus of many international studies, especially in United States of America (e.g., Buysse, 1993; Buysse et al., 2002; Dietrich, 2005; Guralnick et al., 1996), as it is considered an indicator of children's social inclusion. However, having friends (or not) does not mean being popular (or unpopular) (Peceguina, Santos, & Daniel, 2008). Peer acceptance and sociometric status or social network features have been less studied in this particular group of children.

This dissertation aims to improve our knowledge across different levels of social complexity and offers a European perspective on the social experiences of children with disabilities in inclusive preschool settings. Moreover, social experiences of children with disabilities are often described based on teacher or parent reports, rather than on sociometric peer assessments, which has been considered a gap in the literature (Meyer & Ostrosky, 2014). This work considers children's perspective, including children with disabilities, of their relationships.

Teacher-Child Interactions

Classroom quality can be conceptualized in different ways, but it is commonly accepted that it includes both structural characteristics, such as group size, adult-child ratio, teachers' education, and process characteristics, such as teacher-child, teacher-group, and child-child interactions, as well as participation in activities (Vandell &

Wolfe, 2000). Process quality has been consistently reported as having a positive impact on the academic and social development of young children without disabilities (e.g., Burchinal et al., 2008; Mashburn et al., 2008) and on children's social experiences (Mikami, Griggs, Reuland, & Gregory, 2012), with effects lasting over time (Vandell et al., 2010). This work focuses on process quality by addressing proximal processes (i.e., teacher-child interactions) that happen inside preschool classrooms and seem to promote children's development. Considering the important role of teacher-child interactions in organizing children's experiences (Pianta, Hamre, & Allen, 2012) and as a basic mechanism through which children's social development happens (Mashburn et al., 2008), a new quality framework has been recently proposed, the Teaching Through Interactions framework (Pianta, La Paro, & Hamre, 2008). This framework examines different aspects of teacher-child interaction and organizes them in three domains: emotional support, classroom organization, and instructional support (Pianta et al., 2008). Each of these domains is differently related to children's social development.

Emotional support is more frequently related to children's socio-emotional development (Downer et al., 2010). Specifically, it predicts higher ratings of children's social skills and fewer problem behaviors (Mashburn et al., 2008), and moderates the effects of challenging behaviors on teacher-child dyadic relationships (Buyse, Verschueren, Doumen, Damme, & Maes, 2008). It also seems to moderate the effect of poverty and the effect of caregivers' depressive symptoms on children's prosocial behaviors (Johnson, Seidenfeld, Izard, & Kobak, 2013). However, low-to-moderate emotional support levels seem to predict problem behaviors but not social skills (Burchinal, Vandergriff, Pianta, & Mashburn, 2010). Sensitive and warm teachers may facilitate the engagement of children in multiple prosocial interactions, while negative emotional climates possibly promote relational hostility and conflictual teacher-child interactions, as well as less positive child-child interactions (Howes, 2011). The effect of these proximal processes on children's social development is relatively consistent, although modest (Curby et al., 2009; Mashburn et al., 2008). Interestingly, a direct negative effect of higher levels of emotional support was found for social preference, an indicator of social acceptance (Mikami et al., 2012).

The other two domains of teacher-child interactions present inconsistent findings. For example, classroom organization seems to be related to self-regulation development (Downer et al., 2010). However, Cadima, Verschueren, Leal, and Guedes

(2015) did not find gain effects of the organizational domain on self-regulation. High levels of instructional support predict children's social skills (Burchinal et al., 2008), and improve children's self-regulation skills across the school year (Cadima et al., 2015). However, lower levels of cognitive self-control were found for children in classrooms with higher levels of instructional support (Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009).

The studies reported above focused on the interactions between teachers and children without disabilities. In this work, we examine the impact of such proximal processes on the social skills and problem behaviors of children with disabilities. Each domain will be analyzed to help understand the role of different domains of classroom interactions on children's development. The associations between teacher-child interactions and children's social acceptance and friendship will also be examined. These associations are underexplored, both for children with and without disabilities.

Within the bioecological theory, time is also an important variable (Bronfenbrenner & Morris, 2006). The exposure (amount of time) to teacher-child interactions in preschool settings may vary in duration (days, months), frequency, interruption, timing, and intensity (Bronfenbrenner & Evans, 2000). To effectively promote children's development it is likely that (high-quality) proximal processes have to occur frequently, at the right moment, be predictable and intensive enough, and last for a sufficient amount of time (Bronfenbrenner & Evans, 2000). Findings from previous research about the associations between early childhood education dosage (i.e., degree of exposure) and children's social development have been inconsistent; however, it seems that children at risk, who are engaged for more time in higher-quality interactions with teachers, have increased social development outcomes (Zaslow et al., 2010). The exposure to high-quality interactions for long periods of time may function as a protective factor for children at high risk, such as children with disabilities. In the present work, we will analyze the effects of this variable on the social experiences and socio-behavioral development of children with disabilities.

The present work

In our first study, we explore how the individual characteristics of children with disabilities influence their proximal processes, resulting in having more or less positive social experiences. Children's type of disability has been related to their ability to

establish friendships (e.g., Buysse, 1993, Guralnick et al., 1996) and their social acceptance (e.g., Odom et al., 2006). In this study, children with disabilities are grouped into functional profiles, considering a set of domains. Functional disability profiles seem to describe more comprehensively children's functioning than only the diagnostic category (Castro, Ferreira, Dababnah, & Pinto, 2003), allowing for the identification of functional characteristics that, together, may contribute to an increased risk of social exclusion and rejection. Gender (Aguiar et al., 2010) and age (Diamond et al., 2008) have also been related to social inclusion. Their potential role as moderators on the associations between children's disability profile and their friendships, social acceptance, and centrality in the social network will be explored (see Figure 1).

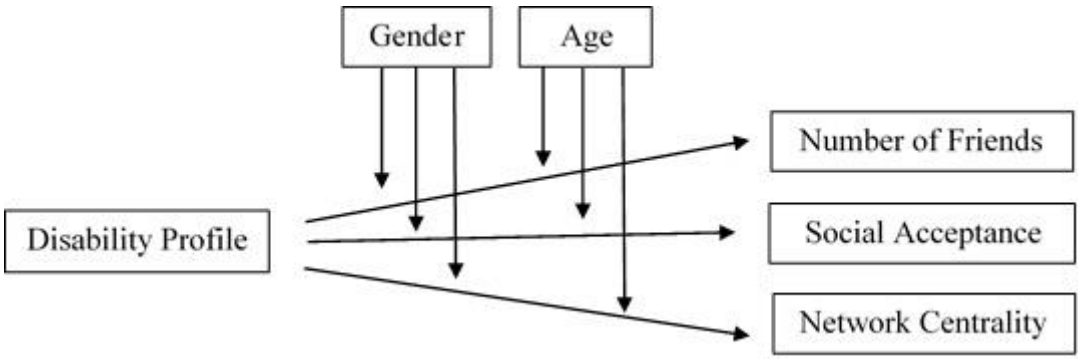

Figure 1. Hypothesized relationships among variables in study 1: The associations between children's disability profile and their social experiences.

In general, this first study describes different social experiences of children with disabilities – number of friends, social acceptance, sociometric status, and characteristics of the social network – reported by children and their peers. The study also identifies disability profiles with increased risk of social rejection and exclusion. Based on previous studies, we believe children with socio-behavioral disabilities will present fewer friends, higher levels of social rejection, and more peripheral positions in the social network, than children with physical disabilities. In this first study, we also compare the social status of children with disabilities based on children and teacher reports. This analysis intends to explore teachers' awareness of processes of social exclusion and rejection in children with disabilities.

The second study focuses on teacher-child interactions (proximal processes), the exposure to these processes (i.e., dosage), and social outcomes of children with disabilities in preschool classrooms. It also focuses on children's individual characteristics, namely verbal competence (e.g., Odom et al., 2006; Son et al., 2014) and socio-behavioral competence (e.g., Meyer & Ostrosky, 2016), as these competences have been previously identified as characteristics that influence the social outcomes of children with disabilities. More specifically, the second study examines (1) the associations between teacher-child interactions and children's friendship and social acceptance, while testing moderator effects of dosage (see Figure 2a), and (2) the relationship between children's verbal competence, social skills, and externalizing behaviors with children's friendship and social acceptance, also testing moderator effects of dosage (see Figure 2b).

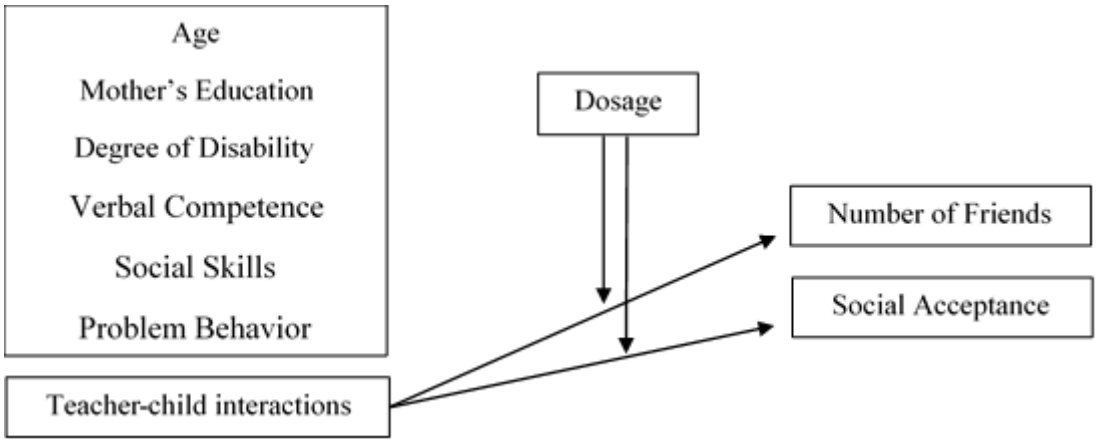

Figure 2a. Hypothesized relationships among variables in study 2: The associations between teacher-child interactions and children's friendships and social acceptance.

Based on the little available research and on Bronfenbrenner and Morris's (2006) theoretical framework, it is expected that children who have spent more time with the lead teacher and have more days of attendance in classrooms with higher quality teacher-child interactions have more friends and are more socially accepted. In addition, we expect a positive effect of spending more time with the lead teacher and having higher attendance for children with less social skills and verbal competence and more problem behaviors.

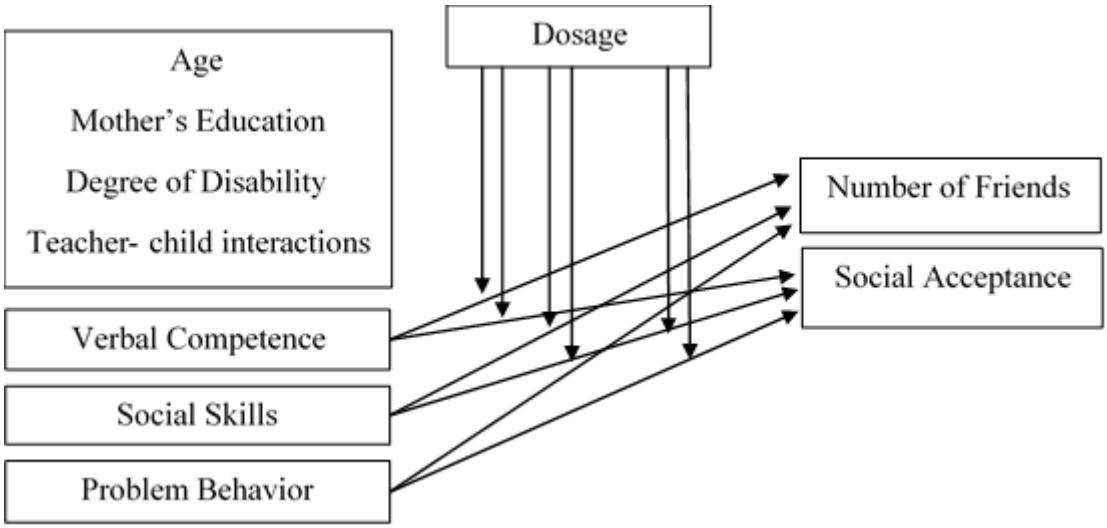

Figure 2b. Hypothesized relationship among variables in study 2: The associations between children's competence and their friendships and social acceptance.

One of the most consistent findings on children's social inclusion is the role of social skills and problem behaviors on their social experiences (e.g., Meyer & Ostrosky, 2016; Odom et al., 2006). High-quality teacher-child interactions have been positively related to the socio-behavioral competence of children without disabilities (e.g., Mashburn et al., 2008); however, we are unaware of such effects on children with disabilities. Therefore, our third study examines the associations between children's degree of disability and their social skills and behavior problems, controlling for previous levels of social and behavioral outcomes, while testing the moderator effects of teacher-child interactions and dosage (see Figure 3).

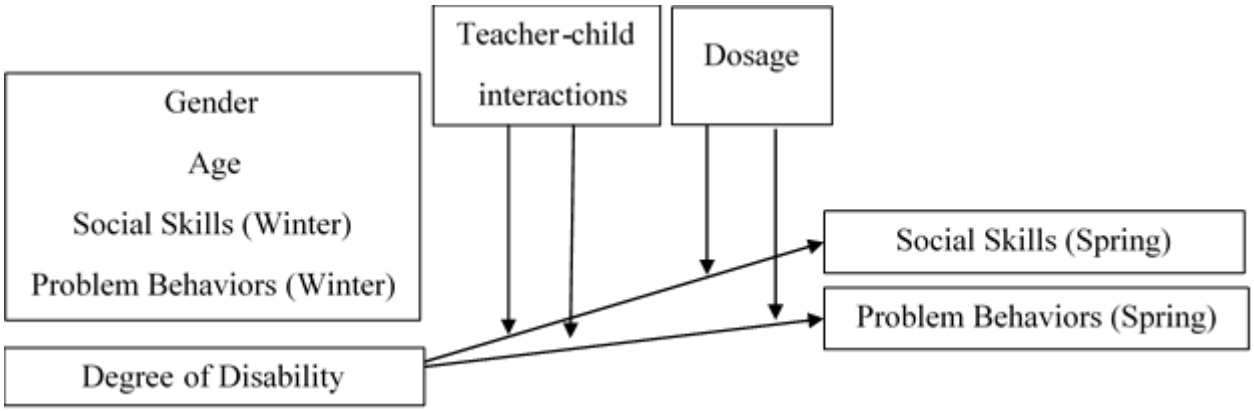

Figure 3. Hypothesized relations among variables in study 3: The associations between children's degree of disability and their social skills and problem behaviors.

A positive moderating effect of both high-quality teacher-child interactions and ECEC dosage is expected for children with more severe disabilities, resulting in improvements in their social skills and problem behaviors over the school year.

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CHAPTER II

Social Experiences of Children with Disabilities in Inclusive Portuguese Preschool Settings [1]

[1] Ferreira, M., Aguiar, C., Correia, N., Fialho, M., & Pimentel, J. S. (in press). Social experiences of children with disabilities in Portuguese inclusive preschool settings. *Journal of Early Intervention.*

Abstract

Based on peer sociometric reports, we examined how number of friendships, social acceptance, and characteristics of social networks vary as a function of disability profile. We also investigated teachers' awareness of the sociometric status of young children with disabilities. Participants were 86 children with disabilities (63 boys) enrolled in inclusive preschool classrooms from the Metropolitan Area of Lisbon, Portugal (M_{age} = 67.33 months, *SD* = 10.54). Findings suggest children with severe or socio-behavioral disabilities may be at increased risk for social rejection and isolation, having fewer friends and lower social network centrality than children with mild disabilities. Low agreement between teachers' classifications of the social status of children with disabilities and classifications based on peer nominations, raises concerns about their awareness of processes of social rejection and neglect. Findings highlight the need for interventions to support positive social experiences at the dyadic and group levels in Portuguese inclusive preschool classrooms.

Keywords: children with disabilities, preschool, social relationships, inclusion

Introduction

Early childhood inclusion aims to promote children's positive social relationships, sense of belonging, and membership, ensuring that every child has opportunities to participate in a variety of activities and contexts, independently of their abilities (DEC/NAEYC, 2009). In inclusive preschool settings, children with and without disabilities have the opportunity to spend time together and interact with each other (Dietrich, 2005). However, children with disabilities seem to spend more time alone than their typically developed peers (Gamelas, 2003) and are more likely to be socially rejected (Odom et al., 2006).

Children's social experiences with peers can be analyzed at different levels of social complexity, including interactions, relationships, and groups (Rubin, Bukowski, & Parker, 2006). Interactions are the most basic level and represent complementary and interdependent social exchanges between two individuals. Relationships refer to a set of interactions that take place within a dyad of individuals who are known to each other, can influence new interactions between the members of the dyad, and are characterized by emotions, expectations, and shared meanings, developed over time. Friendships constitute one particular type of relationship. Finally, the third, and more complex level, is the group, a network of relationships between individuals that influence each other. Typically, groups have specific norms, which characterize them, and properties such as hierarchical organization and cohesiveness (Rubin et al., 2006).

Previous evidence suggests children with disabilities struggle at all levels of peer social experiences. For example, according to Guralnick (1990), children with disabilities present difficulties in engaging in group play and perform specific social behaviors, do not use important social processes such as negotiation, have fewer friendships, and are less often chosen to play or to be a resource or a model for peers.

In this study, we will investigate the social experiences of Portuguese preschoolers with disabilities, in inclusive preschool classrooms, at two levels: relationships (i.e., friendships) and groups. In Portugal, the legal framework for special education is inclusion-oriented, ensuring that 99% of all children with disabilities are served in regular schools (87% in public schools), with only 13% of these not participating full time in their regular classroom (Direção-Geral de Estatísticas da Educação e Ciência, 2016). Recently, based on a representative sample, the Inspeção-

Geral de Educação e Ciência (2015) reported that about 20% of public Portuguese preschool classrooms include at least one child with disabilities. Moreover, the Portuguese preschool coverage rate is rather high, with 96.1%, 90.6%, and 76.9% of children aged 5, 4, and 3 years-old, respectively, enrolled in preschool settings (Direção-Geral de Estatísticas da Educação e Ciência, 2015).

Friendship

Friendships are dyadic, reciprocal, and voluntary relationships (e.g., Goldman, 2007; Rubin et al., 2006). Friends choose to stay with one another, play, express enjoyment and positive affect (e.g., Dietrich, 2005; Hollingsworth & Buysse, 2009). Children with disabilities who establish friendships are more likely to be socially interactive (Guralnick, Gottman, & Hammond, 1996), have less frequent solitary play and more playmates than children without friendships (Guralnick, Neville, Hammond, & Connor, 2007). Furthermore, Meyer and Ostrosky (2016) found evidence that having a close friendship may partially mediate the association between social competence and peer acceptance. Children with disabilities with friends also present better results in behavioral characteristics such as activity level, reactivity, goal-directedness, and responsiveness to adults (Buysse, 1993). In an inclusive setting, friends without disabilities can be an important resource for children with disabilities to develop social competence (Guralnick, 1990), because they tend to support and scaffold dyadic interactions (Guralnick, Connor, & Johnson, 2011).

Friendships of preschool children with and without disabilities seem to be similar (Dietrich, 2005; Hollingsworth & Buysse, 2009; Meyer & Ostrosky, 2014). However, in general, children with disabilities have less reciprocal relationships than peers without disabilities (Buysse, Goldman, & Skinner, 2002). The number of friends seems to be associated with type of diagnosis (Buysse, 1993) and developmental status (Guralnick et al., 1996). For example, research has shown children with language disabilities have more friends than children with developmental delay or cognitive disabilities (Buysse, 1993; Guralnick et al., 1996), and children with reciprocal friends seem to have higher developmental age than children without reciprocal friends (Buysse, 1993).

Studies with preschool-age children without disabilities found that young children form, essentially, same-gender friendship dyads (Vaughn, Colvin, Azria, Caya, & Krzysik, 2001). The same pattern has been found for children with ASD (Kasari et

al., 2011). However, despite the preponderance of boys with disabilities, in most cases their friends are girls (Guralnick et al., 2007). Conversely, Diamond, Hong, and Tu (2008) found it is more likely for a girl to choose a child with disabilities to play with. Therefore, boys may be at a disadvantage when compared to girls and consequently have an increased risk of social rejection. Further examination of the role of gender on the social experiences of children with disabilities is thus warranted.

Social Acceptance

Within a group, individual children can have different social experiences, which can be described in terms of social acceptance and rejection. Social acceptance and rejection quantify how much peers like or dislike a child (Rubin et al., 2006).

Social acceptance and rejection of young children with disabilities have been the subject of few studies (e.g., Odom et al., 2006). Despite the fact that young children in inclusive classrooms show high acceptance towards peers with disabilities (Diamond, 2001), about a quarter of young children with disabilities are rejected (Odom et al., 2006) and typically developing children's identification of a peer as having a disability seems to be negatively associated to their associative/cooperative play (Yu, Ostrosky, & Fowler, 2015).

Children's individual characteristics, such as type of disability, degree of disability, and age seem to be related to their social acceptance. For example, previous research suggests children with speech and language impairments or orthopedic impairments are more socially accepted by peers than children with intellectual disabilities and autism-pervasive developmental disorder (Odom et al., 2006). Furthermore, younger children and children with more severe disabilities seem to be more socially accepted (Aguiar, Moiteiro, & Pimentel, 2010). Research also suggests social acceptance is associated with social behavior such as interest in peers, social awareness, communication, and social skills. In contrast, social rejection appears associated with social withdrawal (related to internalizing behavior problems) and conflict-aggression (i.e., externalizing behavior problems) (Odom et al., 2006).

Sociometric Status

At the group level, children can also be classified into five social statuses - popular, rejected, neglected, average, and controversial (Coie, Dodge, & Coppotelli, 1982; Newcomb, Bukowski, & Pattee, 1993). Social status seems to be an important

predictor of children's subsequent adaptation (Peceguina, Santos, & Daniel, 2008). However, previous research, based on evidence from peer reports, suggests children with disabilities have more disadvantaged sociometric statuses within their peer groups, when compared to their typically developing peers (Ochoa & Olivarez, 1995). Interestingly, to the best of our knowledge, there is no data on teachers' awareness of the sociometric status of young children with disabilities in the peer group, which is likely necessary to identify and support children experiencing social rejection or neglect.

Social Networks

Still at the group level, social networks analysis provides information on the structure of the group and its influence on individuals (Wasserman & Faust, 2009). For example, one may identify cohesive subgroups such as cliques, constituted by at least three individuals with mutual ties (i.e., all "choosing" each other) (Scott, 2009; Wasserman & Faust, 2009) or determine the children's centrality in the peer group based on network activity. Individuals with higher degree centrality have more connections, while individuals with lower degree centrality have fewer links to other individuals in the social network, taking peripheral positions in the group (Scott, 2009).

Very limited research has examined the characteristics of the social networks of preschool children with disabilities. The few available studies focus of specific types of disability, suggesting, for example, that older children with high-functioning Autism Spectrum Disorder (ASD) present low levels of social network centrality, take more peripheral positions in the social structure of the group (Chamberlain, Kasari, & Rotheram-Fuller, 2007), and have a smaller network (Kasari, Locke, Gulsrud, & Rotheram-Fuller, 2011) than their peers. Aguiar, Pimentel, Moiteiro, Boavida, and Figueiredo (2011) found evidence that children with physical disabilities are more involved in peer social networks than children with sociocognitive disabilities.

In conclusion, we now know enough to understand that children with disabilities struggle with the demands of being part of a friendship dyad and a group of children. Early childhood inclusion aims towards ensuring children's positive social relationships, sense of belonging, and membership (DEC/NAEYC, 2009), addressing multiple levels of peer-related social experiences (i.e., individual, dyadic, and group). Consequently, it is important to further understand which individual characteristics place young children with disabilities at an increased risk of social rejection or

exclusion in inclusive preschool settings. As these social experiences occur in the peer system, we will focus on indicators based on peer sociometric reports, contributing to a body of evidence built mostly on teachers' report. Therefore, in this study, we examine how number of friendships, social acceptance, participation in cliques, and degree centrality vary as a function of type of disability. We hypothesize that children with socio-behavioral disabilities are more likely to have fewer friendships, be socially rejected, participate in fewer cliques, and occupy more peripheral positions, than children identified with physical disabilities. We will consider if children's gender and age moderate these associations. Furthermore, we examine teachers' awareness of the sociometric status of young children with disabilities in the peer group by comparing teachers' classification of children's social status and social status derived from standard sociometric data. Such information will likely help understand the extent to which teachers are able to identify children at risk for peer rejection or neglect.

Method

Participants

Eighty-six children with disabilities (63 boys) from 86 inclusive preschool classrooms of the Metropolitan Area of Lisbon, Portugal, participated in the study. Children's age ranged between 45 and 88 months (M = 67.53, SD = 10.54). One child with disabilities was randomly selected per classroom, according to the following criteria: (1) receiving special education or early childhood intervention services under Decree-Law n.º 3/2008 or Decree-Law n.º 281/2009, respectively; (2) not having an extreme disability profile; (3) having parental consent; (4) attending a classroom where at least 60% of all children also had parental consent to participate in data collection procedures; and (5) not attending a classroom serving exclusively or mostly 3 year-olds (in order to increase both the reliability and validity of outcome measures).

Children with extreme disability profiles (e.g., children who were simultaneously deaf and blind and had no mobility) were excluded because, based on our previous experience, these children are usually identified as extreme outliers in most measures, resulting in their removal from subsequent analyses. One child with disabilities was randomly selected in each classroom in order to avoid nesting and decrease the amount of information requested from each teacher. Note, also, that by law, Portuguese preschool classrooms should not include more than two children with disabilities. The minimum participation rate of classroom children in the sociometric

interviews was based on two types of information: previous studies reporting participation rates above 70% (e.g., Santos, Daniel, Fernandes, & Vaughn, 2015) and findings suggesting a more limited pool of participants may also provide valid information (see Zakriski et al., 1999). Nevertheless, mean participation rate in the current study was 82.36% (*SD* = 12.34). Overall, in addition to the 86 target children, participated in the study 1493 children (731 boys), aged between 34 and 89.6 months (*M* = 61.68, *SD* = 8.79).

According to teachers' report, based mostly on the information available on target-children's individual files, 25 children had developmental delay, 19 children had autism spectrum disorders, eight children had rare disorders (e.g., Guillain-Barré syndrome, WAGR syndrome, Goldenhar syndrome), seven children had speech or language impairments, four children had cerebral palsy, three children had Down syndrome, two children had multiple disabilities, two children had emotional disabilities, eight children had other disabilities, five children had no diagnosis (i.e., were receiving services but assessment was still ongoing or had been inconclusive), and data were missing for three children.

Fourteen percent of participating children were rated by teachers as having a profound disability in at least one domain of the ABILITIES Index. Using the same criteria, 42% were rated as having a severe disability, 31% were rated as having a moderate disability, 7% were rated as having a mild disability, and about 4% were rated as having a suspected disability. Data on the ABILITIES Index were missing for two percent of participating children.

In this study, preschool classroom teachers were informants for several variables. Eighty-six teachers (1 male), aged between 24 and 60 years old (*M* = 46.45, *SD* = 8.46) participated. About 96% of teachers had at least one-year experience in classrooms with children with disabilities and 58% had no experience in early childhood intervention or early childhood special education.

About 78% of classrooms were located in public preschools, 15% were located in private non-profit centers, and 7% were located in private for-profit centers. Most classrooms (83.7%) were mixed-aged, with 7% of classrooms serving four-years-olds and 9.3% of classrooms serving five-year-olds. In Portugal, older children have priority for publicly funded preschool enrollment, which means that, typically, mixed-aged

classrooms (especially in urban areas) are mostly composed of 5 and 4 year-old children, with few 3-year olds (considering children's age at the beginning of the school year). The number of children in each classroom ranged between 14 and 27 (M = 21.30, SD = 2.53).

Measures and Procedures

Severity of disability. The ABILITIES Index (Simeonsson & Bailey, 1991/2005) is a measure designed to assess children's functional abilities/disabilities in nine domains (19 items): audition, behavior and social skills, intellectual functioning, limbs, intentional communication, tonicity, integrity of physical health, eyes, and structural status. Teachers rated children on each domain using a 6-point scale (1 = *normal ability*, 2 = *suspected difficulty*, 3 = *mild difficulty*, 4 = *moderate difficulty*, 5 = *severe difficulty*, and 6 = *profound difficulty*). The overall degree of disability across domains was calculated through a sum of all dimensions multiplied by the following weights: audition = 1.8; social skills = 1.4; inadequate behavior = 1.7; intellectual function = 2.0; limbs, hands = 1.5; limbs, arms = 1.4; limbs, legs = 1.6; understanding = 1.2; communicating with others = 1.0; tonicity, tightness = 1.5; tonicity, looseness = 1.4; overall health = 1.5; vision = 1.7; and structural status = 1.3 (Grande & Aguiar, 2011).

This index has been used in Portuguese studies and has shown internal consistency, informant agreement, convergent-discriminant validity (Grande & Aguiar, 2011), and stability over time (Bailey, Simeonsson, Buysse, & Smith, 1993). In this study, internal consistency was .81 for all items.

Verbal and nonverbal competence. Verbal and nonverbal competence of children with disabilities was assessed with the validated Portuguese version of the Wechsler Preschool and Primary Scale of Intelligence - Revised (WPPSI-R) (Wechsler, 2010). This is a standardized measure, composed of two scales, verbal and performance, with six subtests for each one. In this study, we used four or five subtests of each scale. For the verbal competence score, we used the information, arithmetic, vocabulary, similarities, and comprehension (optional) subtests; for the performance score, we used the object assembly, geometric design, block design, picture completion, and mazes (optional) subtests. Children's testing was conducted individually, in a quiet room at the preschool center, by researchers with (at least) a master's degree in psychology. We

calculated mean scores for the two scales. Internal consistency was .92 for verbal competence and .84 for performance scores.

Social skills and problem behaviors. Teachers completed the preschool version of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990/2007) to assess children's social skills and problem behaviors. As in previous studies (Aguiar et al., 2010), we used two scales, social skills (α = .93) and problem behaviors (α = .82), as well as two subscales of problem behaviors: externalizing problems (α = .85) and internalizing problems (α = .68). Children's behaviors were rated on frequency (0 = *never*, 1 = *sometimes*, 2 = *very often*) for a total of 40 items, 30 items related to social skills and 10 items related to problem behaviors (six items for externalizing problems and four items for internalizing problems). For social skills, higher scores reflected higher competence. For problem behaviors, higher scores reflected more behavior problems.

Friendship. Collection of sociometric data began in January/February, about four to five months after the beginning of the school year, in order to allow social relationships to become stable and friendships to develop. Individual interviews were performed, in a separated room, with all children in the classroom with parental consent. The interviews followed a detailed protocol and were conducted by researchers with (at least) a master's degree in psychology. During the interview, two different sociometric measures were used: peer nominations and ratings. These sociometric measures have often been used in studies about friendship and social acceptance (e.g., Aguiar, Moiteiro, & Pimentel, 2010; Meyer & Ostrosky, 2016; Peceguina et al., 2008). In these two tasks, we used photographs of all children in the classroom. In the peer nomination task, children were asked to choose three children (photos) they "like to play the most" (positive nominations) and three children they "liked to play the least" (negative nominations). For peer ratings, we used children's photographs and three boxes, one with a happy face to put photos of the peers children "liked to play with a lot" (rating of 3), another with a neutral face to put photos of peers they "liked to play with sometimes" (rating of 2), and the last one, with a sad face, to put the photos of children they "did not like to play with" (rating of 1). Prior to the peer ratings task, several trials using pictures of different foods were conducted to establish children's understanding of the task. Children with disabilities were also invited to participate, except in two cases due to their disability profile (i.e., affecting vision or communication). Six children with

disabilities did not understand the sociometric tasks (i.e., were non-responsive or could not successfully complete the initial trials with pictures of food) and one child left the center prior to the sociometric data collection (resulting in missing data for friendship data). These data were converted into two sociometric matrixes (nominations and ratings) and a new matrix was created to identify children's friendships, based on reciprocal positive nominations and positive ratings, cumulatively. Therefore, only when a child with disabilities both nominated and rated positively a peer and, in turn, the same peer nominated and rated positively the child with disabilities, were the two children identified as reciprocal friends.

Social acceptance. In each classroom, mean sociometric ratings received by each child were converted into a *z* score, reflecting individual children's social acceptance.

Sociometric status. Sociometric status of children with disabilities was calculated from the absolute frequency of positive nominations from peers (like most – LM) and negative nominations (like least – LL), social preference (P = LM - LL) and social impact (I = LM + LL). Social preference and social impact are based on standardized scores of positive and negative nominations. Children with disabilities were classified in six sociometric status groups: (a) popular children (P > 1.0, LM > 0, and LL < 0), (b) rejected children (P < 1.0, LL > 0, and LM < 0), (c) neglected children (I < 1.0 and absolute frequency of positive nominations = 0), (d) controversial children (I > 1.0, LM and LL > 0), (e) average children (P and I between -0.5 e 0.5), and other (children not classified with any sociometric status) (Peceguina et al., 2008).

Sociometric status was also evaluated by teachers, based on their perception of children's experiences in the group. Based on Andrade et al. (2005), teachers were asked to classify each child as being: (a) actively rejected by his/her peers (rejected), (b) mostly ignored by his/her peers (neglected), (c) actively rejected by some peers but popular among other peers (controversial), (d) average popular (average), or (e) very popular among his/her peers (popular). Preliminary results, based on teachers' classifications of children's sociometric status in elementary school-aged children, suggest the concurrent validity of this procedure, based on associations with peer nominations (Andrade et al., 2005).

Social Networks. The sociometric matrixes previously described were used to compute children's degree of centrality and number of cliques, based on social network analyses with UCINET (v. 6.553). UCINET (Borgatti, Everett, & Freeman, 2002) is a software that involves a set of network analyses techniques, allowing researchers to identify and visualize different social networks structures and substructures, as well as the relationship between individuals or the relationships of a specific individual (Hanneman & Riddle, 2005). In this study, children's centrality was operationalized as normalized degree centrality (i.e., the number of vertices adjacent to a given vertex, divided by the maximum possible degree, expressed as a percentage) and cliques were operationalized as the number of maximal complete sub-graphs (i.e., subgroups in which all children are connected to each other), with a minimum of three children, each child participated in.

Results

Descriptive statistics

Descriptive statistics for study variables are presented in Table 1. According to teachers' report, children with disabilities displayed average social skills and externalizing behavior, and low levels of internalizing behavior.

Table 1. *Descriptive statistics*

	M	*SD*	Min.	Max.	*N*
Social Skills	0.95	0.39	0.07	1.85	86
Problem Behavior	0.76	0.40	0.00	1.90	86
Problem Externalizing Behavior	0.97	0.53	0.00	2.00	86
Problem Internalizing Behavior	0.45	0.42	0.00	1.75	86
Non Verbal Competence	6.72	3.12	1.00	15.00	81
Verbal Competence	5.95	3.23	1.00	15.00	81
Number of Reciprocal Friendships	0.45	0.64	0.00	2.00	76
Social Acceptance (*z* Scores)	-0.55	1.00	-2.63	2.03	84
Centrality - Degree	0.03	0.04	0.00	0.20	76
Number of Cliques	0.04	0.20	0.00	1.00	76

Regarding the number of reciprocal friendships, about 55.8% of children had no friends, 25.6% had one friend, and only 7.0% had two friends. Note that 11.6% of the children did not participate in the sociometric tasks or did not understand them, resulting in missing data on reciprocal friendships. Average social acceptance was low,

with 45.9% of children scoring below the 25th percentile of their classroom peer group and only 8.2% scoring above the 75th percentile. Furthermore, children with disabilities had a low degree of centrality and only three children with disabilities were involved in a clique.

Sociometric status based on sociometric peer nominations and teacher report

Children's sociometric status classified by teachers was more positive than sociometric status based on peer sociometric nominations. As shown in Table 2, these two classifications showed low agreement, with teacher classifying 26.8% of children as popular and 3.7% of children as rejected while classifications based on peer nominations resulted in 3.7% of children classified as popular and 41.5% classified as rejected.

Table 2. *Children with disabilities sociometric status rated by peers and teachers*

		Sociometric status rated by teacher					Total
		Rejected	Neglected	Controversial	Average	Popular	
Sociometric status - Peers	Rejected	2	3	8	13	8	34
	Neglected	0	0	1	3	0	4
	Controversial	0	0	1	0	0	1
	Average	0	0	4	4	3	11
	Popular	0	0	1	1	1	3
	Other	1	2	7	9	10	29
	Total	3	5	22	30	22	82

Teacher or peer data were missing for four children (therefore, for this analysis, n = 82). The chi-square test was performed to examine independence of teacher and peer ratings. Monte Carlo simulation was used to ensure statistical accuracy, because the assumptions of χ^2 were not verified (Maroco, 2011). Results indicated that the sociometric status rated by teachers was independent of the sociometric status rated by peers ($\chi^2(16) = 8.31$, $p = .93$, $n = 53$).

Correlations among variables

Table 3 presents the Spearman correlation coefficients among variables. As expected, centrality and number of reciprocal friendships were strongly correlated. Peer social acceptance was negatively and moderately correlated to problem behaviors, and, specifically, externalizing behaviors. Verbal competence was moderately correlated

with the number of reciprocal friendships and degree of centrality. Sociometric status rated by teacher (but not sociometric status based on peer nominations) was strongly positively correlated with social skills and negatively correlated with problem behaviors, including both externalizing (moderate effect) and internalizing behaviors (noteworthy effect). Sociometric status rated by teachers was also correlated with peer social acceptance.

Table 3. *Spearman correlation coefficients among variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Gender (boys =1, girls =0)	-												
2. Age	-.05	-											
3. Social Skills	-.21	.17	-										
4.Problem Behavior	.27*	-.05	-.52**	-									
5. Externalizing Behavior	.22*	-.06	-.41**	.92**	-								
6. Internalizing Behavior	.29**	-.03	-.52**	.62**	.29**	-							
7. Non Verbal Competence	.08	-.05	.23*	-.15	-.18	.01	-						
8. Verbal Competence	-.00	-.17	.34**	-.14	-.16	-.05	.65**	-					
9. Number of Friendships	.20	-.11	.27*	-.18	-.16	-.09	.30**	.45**	-				
10. Social Acceptance (*Z* Scores)	-.13	-.17	.01	-.28*	-.28**	-.12	-.03	-.00	.33**	-			
11. Sociometric Status - Peers	-.20	-.13	-.12	-.04	-.06	.04	.21	.09	.43**	.43**	-		
12. Sociometric Status - Teacher	-.16	.09	.53**	-.43**	-.26*	-.57**	.04	.11	.20	.25*	.06	-	
13. Centrality - Degree	.20	-.11	.25*	-.17	-.16	-.06	.31**	.44**	.98**	.35**	.45**	.19	-
14. Number of Cliques	-.03	.08	.19	-.28*	-.28*	-.13	.25*	.12	.38**	.25*	.42**	.04	.38**

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

Characteristics of accepted and rejected children

Based on standardized scores of social acceptance, we divided participating children in two distinct groups: accepted and rejected children. Similar to Odom et al. (2006), children were considered accepted if they had a score of social acceptance above 0.5 and rejected if had a score below -1.0. These criteria were used over popular and rejected sociometric status because we were interested in social acceptance within the group and not popularity among peers. Using such criteria, 16 children (19%) were identified as accepted and 29 children (34.5%) were identified as rejected. Table 4 presents the characteristics of both groups of children.

Table 4. *Information of type of disabilities, severity of disabilities, social skills, problem behavior, verbal and nonverbal competence, reciprocal friendship, and social network for socially accepted and rejected groups.*

Variable	Accepted (*n* = 16)	Rejected (*n* =29)	*U*
Gender			
Girls	4	6	
Boys	12	23	
Type of Disability			
Developmental Delay	3	10	
Autism Spectrum Disorder	5	7	
Speech or Language Impairments	2	0	
Multiple Disabilities	0	2	
Down Syndrome	1	0	
Cerebral Palsy	0	1	
Rare Disorder	1	3	
No Diagnosis or Other Disabilities	3	4	
Age (months)	62.97 (9.11)	68.33 (10.77)	1.68*
Severity of Disabilities	60.33 (19.39)	55.04 (13.64)	-1.05
Social Skills	0.97 (0.52)	0.96 (0.32)	218.50
Problem Behavior	0.61 (0.34)	0.93 (0.41)	2.73**
Externalizing Behavior	0.68 (0.45)	1.18 (0.51)	3.29 **
Internalizing Behavior	0.50 (0.45)	0.57 (0.49)	0.45
Verbal Competence	6.00 (3.96)	5.98 (3.21)	-0.02
Non Verbal Competence	6.83 (4.04)	6.90 (2.90)	0.07
Number of reciprocal friendships	0.82 (0.87)	0.18 (0.39)	218.00*
Social Network			
Cliques	0.18 (0.41)	0.00 (0.00)	182.00
Centrality – Degree	0.05 (0.06)	0.01 (0.03)	220.00*

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

The type of disabilities most represented in the rejected children group was developmental delay. When compared to rejected children, accepted children were younger (d = -0.54); had fewer behavior problems (d = -0.85), specifically, externalizing behavior problems (d = -1.04); had a higher number of reciprocal friends (d = 0.62); and were more likely to be involved in a clique (d = 0.79).

Social experiences as a function of type of disability

In order to describe the social experiences of children with different disability profiles, we first conducted hierarchical clusters analysis, using Ward's method. Sensorial skills (mean scores of audition and vision) and Body and overall health (mean scores of limbs, tonicity, integrity of physical health, and structural status) from the ABILITIES Index, the verbal and nonverbal competence scores from the WPPSI-R, and the social skills and problem behaviors (reversed) scores from the Social Skills Rating System were used in cluster analysis. As some variables represented ability and others disability, to ensure consistency and facilitate interpretation, we reversed all scores representing disability, therefore reversing all dimensions from the ABILITIES Index and problem behaviors from the SSRS. For seven children, data were missing for at least one measure used in this cluster analysis (therefore, n = 79). Table 5 presents the characteristics of children included in each disability profile. Hierarchical cluster analysis grouped children in four disability profiles (see Figure 1): mild disabilities (n = 27), severe disabilities (n = 15), socio-behavioral disabilities (n = 24), and physical disabilities (n = 13).

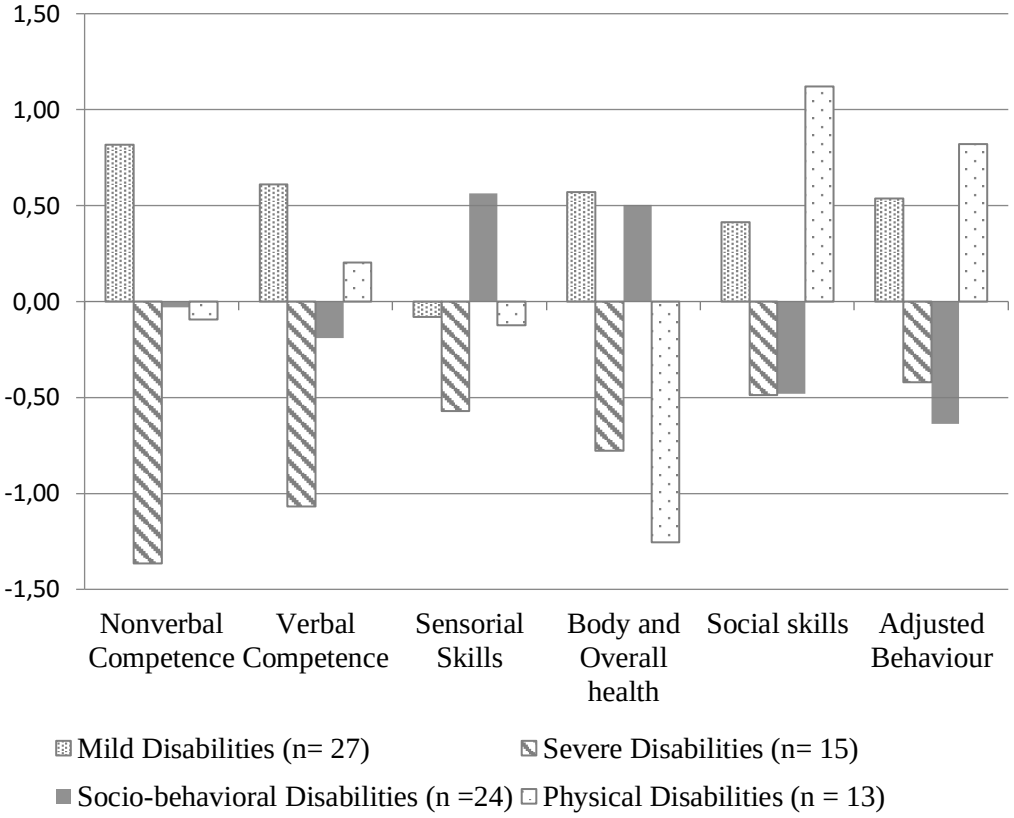

Figure 1. *(Dis)Abilities Profile based on Hierarchical Cluster Analysis (Ward's Method)*

The mild disabilities profile included a relatively high-functioning group of children, across most areas. The severe disabilities profile included a low-functioning group of children, across most areas, particularly in verbal and nonverbal performance, as measured by the WPPSI-R, and body and overall health. The socio-behavioral disabilities profile included children with lower scores on social skills and appropriate behavior and relatively high functioning in sensorial skills, body structure and health. Finally, the physical disabilities profile included children with lower than average body and overall health and higher than average social skills and adjusted behavior.

Table 5. *Information of type of disabilities, friendship and social network for disabilities profile*

Variable	Mild Disabilities (*n*=27)	Severe Disabilities (*n*=15)	Socio-behavioral Disabilities (*n*=24)	Physical Disabilities (*n*=13)	X^2_{KW}
Gender					
Girls	8	4	3	5	
Boys	19	11	21	8	
Type of Disability					
Developmental Delay	5	6	10	4	
Autism Spectrum Disorder	7	1	8	1	
Speech or Language Impairments	5	0	2	0	
Cerebral Palsy	0	2	0	2	
Down Syndrome	0	3	0	0	
Multiple Disabilities	1	0	1	0	
Rare Disorder	1	3	0	3	
No Diagnosis or Other Disabilities	7	0	3	3	
Age	68.46 (9.12)	70.48 (12.74)	67.00 (9.12)	66.54 (9.94)	0.50
Number of Friendships	.67 (.68)	.09 (.30)	.30 (.56)	.62 (.77)	9.12*
Social Acceptance	- .45 (.87)	- .51 (1.05)	- .93 (1.00)	- .35 (.98)	1.51
Social Network					
Cliques	.11 (.32)	.00 (.00)	.00 (.00)	.00 (.00)	7.68
Centrality - Degree	.04 (.05)	.01 (.02)	.02 (.04)	.04 (.05)	5.37

Note. The values within parentheses are standard deviations.

* $p < .05$.

Disability profiles differed as a function of the number of reciprocal friends ($X^2_{KW}(3) = 9.12$, $p = .03$, $n = 74$), with children with severe disabilities having fewer reciprocal friends than children with mild ($d = -1.10$) or physical disabilities ($d = -0.91$), and children with socio-behavioral disabilities having fewer friends than children with mild disabilities ($d = -0.59$).

In order to test the hypothesized moderating effects of children's gender and age on the associations between disability profile and children's number of reciprocal friends, social acceptance, and degree of centrality, we conducted multiple regression analysis. Dummy coding was used for disability profiles, selecting mild disabilities as

the reference group. Four models were tested for each outcome: the first model included only disability profile; the second model included disability profile, gender, and age; the third model tested the interactions between gender and disability profile, controlling for children's age; and, finally, the fourth model tested the interactions between age and disability profile, controlling for children's gender. Regression models predicting social acceptance and network centrality were not statistically significant and are not reported, for parsimony.

The first model for friendship, $F(3,70) = 3.06$, $p < .05$, $R^2_a = .08$, replicated the effects of the inferential analyses, indicating that children with severe or socio-behavioral disabilities had fewer friends than children with mild disabilities (see Table 6). These effects were stable across the first two models. The second model, $F(5,68)=2.76$, $p < .05$, $R^2_a = .11$, indicated a statistically significant effect of children's gender which was not replicated in the subsequent models. In the third model, $F(8,65)=2.43$, $p < .05$, $R^2_a = .14$, an interaction between the physical disabilities profile and children's gender was found, associated with the fact that girls with physical disabilities, in this sample, had no reciprocal friends. Finally, the fourth model, was not statistically significant, and consequently did not confirm interactions between children's disability profile and age.

Table 6. *Multiple Regression Analysis for Variables Predicting Number of Reciprocal Friendships*

	Model 1			Model 2			Model 3			Model 4		
	B	*SE β*	*β*	*B*	*SE β*	*β*	*B*	*SE β*	*β*	*B*	*SE β*	*β*
Severe Disabilities[a]	-.58	.22	-0.32*	-.54	.23	-0.30*	-.55	.23	-0.31*	-.47	.29	-0.26
Socio-behavioral Disabilities[a]	-.36	.18	-0.26*	-.42	.18	-0.30*	-.42	.18	-0.30*	-.42	.18	-0.30
Physical Disabilities[a]	-.05	.21	-0.03	-.03	.21	-0.02	.06	.21	0.04	-.03	.21	-0.02
Gender				.34	.16	0.23*	.32	.17	0.22	.34	.17	0.24
Age				-.00	.01	-0.03	-.00	.01	-0.02	-.00	.01	-0.03
Severe disabilities x Gender							.10	.46	0.03			
Socio-behav. disabilities x Gender							.31	.46	0.09			
Physical disabilities x Gender							.94	.43	0.27*			
Severe disabilities x Age										-.01	.03	-0.08
Socio-behav. disabilities x Age										-.00	.02	-0.01
Physical disabilities x Age										-.02	.02	-0.08
R^2		.12			.17			.23			.18	
F for chance in R^2		3.06 *			2.76 *			2.43 *			1.74	

Note. [a] Profile of reference is Mild Disabilities.

* $p < .05$.

Discussion

In this study, we examined how number of friendships, social acceptance, and characteristics of social networks varied as a function of disability, while testing for the moderating effects of gender and age. We also aimed to examine teachers' awareness of the sociometric status of young children with disabilities in the peer group by comparing teachers' classification of children's social status and social status obtained through peer nominations. We anticipated that children with socio-behavioral disabilities (including behavior problems) would be more likely to have fewer friendships, be socially rejected, have smaller networks, and occupy more peripheral positions, than children identified with physical disabilities. Our hypothesis was only partially confirmed. However, the social experiences of children with disabilities do seem to vary as a function of their disability profile. Our findings suggest that children with severe or socio-behavioral disabilities have fewer friends than children with mild disabilities. Nevertheless, children with physical disabilities did not differ from children with mild disabilities in predicting the number of friendships. In our sample, children with severe disabilities across domains and children with socio-behavioral disabilities experienced unfavorable circumstances at the relationship level, as suggested by the number of reciprocal friendships. These findings are mostly consistent with reports from Aguiar et al. (2011), in that participation in social relationships seem to be more challenging for children with social and behavioral problems or for children with severe disabilities in multiple developmental domains (including cognitive, social, and behavior difficulties), but not particularly for children with physical problems. Our approach to type of disabilities was not based on diagnostic category, as most studies in the field, but rather focused on the description of children's functioning on several domains, independent of their diagnosis. However, we do note that disabilities such as developmental delay (see Guralnick et al., 1996) and autism spectrum disorder (see Odom et al. 2006) were the most represented in the disability profiles with fewer friends.

Age and gender were tested as moderators of the associations between disability profile and friendship. Based on previous research (Aguiar et al., 2010), we expected younger children to be more accepted than older children and to have more friends. However, despite the fact that descriptive analyses examining the characteristics of accepted and rejected children showed that the accepted group was, on average,

younger, no statistically significant effect was found for age in hierarchical multiple regression controlling for type of disabilities and gender. In this study, gender had an effect on the number of friendships in one of the models which disappeared when interactions were tested between gender and disability profile. Statistically significant interactions between the physical disabilities profile and gender suggest that girls with physical disabilities had fewer friends (actually, none of the girls in this profile had a single friend). This finding was unexpected, because same-gender group dyads are prevalent in this age-group (Vaughn et al., 2001) and girls are more likely to choose a child with disabilities to play with (Diamond et al., 2008). Thus, confirmation based on studies with larger samples is warranted, aiming to examine if disabilities associated with use of limbs, tonicity, integrity of physical health, and body structure, likely more visible to other children than other disabilities, are socially more detrimental for girls than boys, which raises important gender issues.

When examining the characteristics of accepted and rejected children, based on peer sociometric ratings, we found that accepted children had more friends, higher social network centrality, and might be involved in a clique (which did not happen in the rejected group). Other differences between accepted and rejected children were related to children's age (as discussed above) and problem behaviors, with rejected children showing higher levels of problem behaviors and, specifically, externalizing problems, since differences in internalizing behavior were not statistically significant. The salience of children's externalizing behavior to peer rejection is consistent with previous literature (Odom et al., 2006).

We report fewer friends for children with disabilities than the majority of other studies (e.g., Buysse, 1993). These differences may be accounted for the use of different informants and methods, associated with different criteria for defining friendship. Note that few studies have considered the perspective of children in identifying friendships of children with disabilities (Meyer & Ostrosky, 2014), with previous reports of children's friendships, clearly more positive, relying mostly on teachers' or parents' reports (e.g., Buysse, 1993). However, recently, using peer nominations, Meyer and Ostrosky (2016) found a similar mean number of friends for children with disabilities, prior to implementing an intervention to increase the number of close friendships.

Interestingly, our findings on children's social status suggest different informants, in this case, children and teachers, provide different views of the status of

children with disabilities in their peer group. Teachers only classified 3.7% of children with disabilities as being rejected by the peer group. This proportion is similar to previous reports of teacher ratings of children without disabilities (Andrade et al., 2005). However, classifications of social status based on peer sociometric nominations resulted in 41.5% of children considered to be rejected by their peers. The independence of teacher and peer classifications of social status is also visible in the percentage of children considered to be popular within the peer group, with teachers classifying 26.8% of children as popular and only 3.7% of children classified as popular on the basis of peer reports. Naturally, it can be argued that different constructs were measured through teacher and peer reports, given the distinction between sociometric popularity, an indicator of acceptance, and perceived popularity (see Asher & McDonald, 2009). While such differences may partially account for the disagreement found among teacher and peer reports of peer social status, the modest to strong correlations previously reported between perceived popularity and sociometric popularity (see Asher & McDonald) suggest the independence in teacher and peer reports found in this study should be valued. As social status seems to be an important predictor of children's outcomes (see Rubin et al., 2006), it is important that teachers are attuned to the social experiences of children with disabilities in their group, being able to identify processes of social rejection and neglect that hinder the desired outcomes of early childhood inclusion. Because being able to identify children at risk for social rejection is instrumental in providing support, our findings suggest this may be an important area of professional development.

Few studies describe features of the social networks of young children with disabilities. In this study, children presented low centrality, which means they occupied peripheral positions in the group, with few reciprocal connections to their peers. Findings are consistent with previous research reporting limited social networks (Guralnick, 1997) and low levels of centrality (Kasari et al., 2011) for children with disabilities.

Limitations

Several limitations should be considered in discussing our findings. The number of participants was small, with a highly diverse range of disabilities, which may limit our understanding of the specificities of different disability profiles. Moreover, some children with disabilities did not understand the sociometric task or could not

participate, resulting in a possible bias associated with missing data on children likely to exhibit lower-level functioning. Another limitation to be considered is related to the participation rate of classroom children in the sociometric tasks: whenever full participation is not secured, the complete range of relationships and social structures within the classroom cannot be accessed. Furthermore, as teacher's awareness of children's social status among the peer group is likely to be influenced by the amount of time children spend in the classroom, children's attendance and time spent in pull-out interventions should considered in future research on this topic. Note, however, that time is likely to be relevant both for teacher and peer perceptions of children's social status. Finally, building on the need for more studies with children as informants, including children with disabilities themselves (Meyer & Ostrosky, 2014), we recruited both teachers and children as participants. However, consideration of parents' reports would add relevant information on children's experiences with peers, namely outside the preschool setting, due to their role in promoting and supporting children social relationships (Buysse, 1993; Yu, Ostrosky, & Fowler, 2011).

Conclusions

Concluding, based on an approach focused on functionality rather on diagnosis, we found that children with severe disabilities across multiple domains, and children with socio-behavioral disabilities may be at increased risk for social rejection and, therefore, may need focused interventions aiming for positive social experiences, especially at the dyadic level. Girls with physical disabilities are also likely to benefit from tailored interventions. Based on peer reports, our findings suggested considerable levels of rejection and isolation experienced by children with disabilities in Portuguese inclusive early childhood settings, of which early childhood teachers may not be fully aware of.

Implications

Based on our findings, we recommend Portuguese preschool teachers should benefit from professional development opportunities aiming to (a) support their efforts in identifying children experiencing social rejection by their peers and (b) promote peer relationships, particularly for children with socio-behavioral disabilities and severe disabilities. Interventions such as the *Pyramid Model for promoting social-emotional competence (see* Hemmeter, Snyder, Fox, & Algina, 2016) might be important resources to this effect. Early childhood intervention/early childhood special education

professionals might also have an important role in supporting preschool teachers in these tasks, namely through consultation practices.

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CHAPTER III

Friendships and social acceptance of children with disabilities: The role of teacher-child interactions, individual skills, and ECEC dosage[1]

[1] Ferreira, M., Aguiar, C., Correia, N., Fialho, M., & Pimentel, J. S. (2016). Friendships and social acceptance of children with disabilities**:** The role of teacher-child interactions, individual skills, and ECEC dosage. Manuscript submitted for publication.

Abstract

Children with disabilities attending inclusive early childhood education and care (ECEC) struggle with social experiences with peers. This study investigated the relationship between teacher-child interactions, children's verbal, social, and behavioral skills, and the friendships and social acceptance of children with disabilities, while testing the moderator effects of ECEC dosage. Eighty-six children with disabilities (63 boys; M_{age} = 53; *SD* = 10.54), attending 86 inclusive ECEC classrooms from the Metropolitan Area of Lisbon, Portugal, participated in the study. *Research Findings:* We found no effects of teacher-child interactions on children's social acceptance and friendships and ECEC dosage did not moderate this relationship. However, ECEC dosage moderated the association between children's individual skills and their social acceptance and friendship. Children with lower verbal competence and children with more externalizing behaviors had lower social acceptance when they attended more school days. Additionally, children with more externalizing behavior had fewer friends when they spend more months with the lead teacher. *Practice or Policy:* Findings suggest ECEC dosage matters for children's social acceptance and friendships. More time in ECEC is not enough to support children's social acceptance, particularly for children with increased language and behavioral difficulties, who likely require more intensive and individualized interventions to support and enhance their peer relationships.

Keywords: teacher-child interactions, children with disabilities, social acceptance, friendship, dosage

Introduction

Social outcomes such as establishing positive relationships, namely friendships, and developing a sense of belonging and membership are central to high-quality early childhood inclusion for all children (DEC/NAEYC, 2009). Research findings suggest children with disabilities attending inclusive early childhood education and care (ECEC) settings are more likely to have a reciprocal friendship than children attending specialized settings (Buysse, Goldman, & Skinner, 2002), probably as a result of exposure to more peers without disabilities, which are more available to interact and play. However, children with disabilities seem to experience more time alone in inclusive ECEC classrooms (Gamelas, 2003), have few friends (Guralnick, Gottman, & Hammond, 1996), and experience more risk of social rejection (Odom et al., 2006), suggesting the need to investigate the conditions under which inclusive ECEC settings facilitate desired social outcomes for children with disabilities.

Exposure to high-quality teacher-child interactions in ECEC settings seems to have positive and persistent effects on children's development (Bryant, Zaslow, & Burchinal, 2010; Buyse et al., 2008; Vandell, Belsky, Burchinal, Steinberg, & Vandergrift, 2010). Teacher-child interactions are recognized as important experiences (Downer, Sabol, & Hamre, 2010), representing proximal processes characterized by exchanges between individuals that can either enhance or hinder each other's development (Bronfenbrenner & Evans, 2000). Teacher-child interactions and relationships are important indicators of process quality (Vandell & Wolfe, 2000) and have been described as encompassing three domains: emotional support, classroom organization, and instructional support (Downer et al., 2010). Children who experience emotionally supportive interactions with teachers in ECEC classrooms seem to display higher levels of social skills and lower levels of problem behaviors (Mashburn et al., 2008). Additionally, consistency of teachers' emotional support also seems to be important: children from classrooms with more consistent emotional support present more social skills (Curby, Brock, & Hamre, 2013). Classrooms with high instructional support, that is, classrooms with teachers that support children concept development, provide high-quality feedback, and encourage children communication (Pianta, La Paro, & Hamre, 2008), also predict children's social performance (Burchinal et al., 2008). Finally, classroom processes such as behavior management and productivity (Pianta et

al., 2008) are related to self-regulation and school engagement (Rimm-Kaufman, Curby, Grimm, Nathanson & Brock, 2009).

The level of exposure to these proximal processes may influence development in different ways, depending on its frequency, predictability, duration, and timing (Bronfenbrenner & Evans, 2000), which may help explain the low to moderate effect sizes reported for ECEC experiences. Research on teacher-child interactions has considered different approaches to measure children's exposure to ECEC settings, also known as dosage, including hours per day or per week, attendance/absence over one school year, etc. (Xue et al., 2016; Zaslow et al., 2010). While different levels of exposure to ECEC seem to be related to children's academic outcomes (e.g., Xue et al., 2016), effects on socio-behavioral outcomes seem to be less consistent. Some studies have reported positive effects of exposure to high-quality teacher-child interactions, namely for disadvantaged children (Zaslow et al., 2010); however, other studies have found no evidence of effects of ECEC exposure on social skills and behavior problems (Xue et al., 2016).

Teacher-child interactions may be particularly important for children at risk. For example, Buyse et al. (2008) found positive effects of emotionally supportive interactions for children at risk of establishing less close and more conflictual relationships with teachers because of their internalizing and externalizing behavior. Similarly, moderation effects of emotional support were found for prosocial behaviors of children with caregivers with depressive symptoms (Johnson, Seidenfeld, Izard, & Kobak, 2013). Furthermore, children from poor families seem to improve their social skills and adjusted behavior when experiencing high levels of emotional support (Burchinal, Vandergrift, Pianta, & Mashburn, 2010). Interestingly, moderate-to-low emotional support does not seem to predict social competence but positively predicts behavior problems (Burchinal et al., 2010). Focusing on indicators of children's social acceptance within the peer group, Mikami, Griggs, Reuland, and Gregory (2012) reported low social preference stability for children attending classrooms with higher levels of emotional support, which may translate into increased opportunities for children with initial lower social preference. However, children with high levels of externalizing behavior showed decreases in social preference throughout the school year, regardless of the level of emotional support provided by teachers.

Collectively, these findings support the expectation that teacher-child interactions may also play an important role in fostering the social development of a particular type of disadvantaged children, that is, children with disabilities. Research is needed to understand the role of teacher-child interactions in fostering the social outcomes of children with disabilities in inclusive ECEC settings. Previous research focusing on the associations between global classroom quality and the social acceptance of children with disabilities in Portuguese inclusive ECEC settings found no evidence of such associations (e.g., Aguiar, Moiteiro, & Pimentel, 2010). While ECEC quality in such settings may not have been high enough to produce the expected effects, and the measure of ECEC quality included dimensions of structure quality unlikely to impact social outcomes, children's exposure to ECEC experiences was also not controlled or tested as a predictor or a moderator.

Early childhood inclusion does seem to have a positive impact on the social outcomes of both children with and without disabilities (e.g., Buysse et al., 2002; Diamond, 2001; Nikolaraizi et al., 2005). Specifically, the proximity afforded by ECEC inclusion may result in increased opportunities for the development of friendships between children (Dietrich, 2005). A fundamental characteristic of friendship is reciprocity: friends spend time together, play, and show mutual affection, consistently across time, and in different activities (Dietrich, 2005). Friendships are identified by parents and teachers as important emotional and cognitive resources, which provide opportunities to learn about relationships (Hollingsworth & Buysse, 2009). However, simply being together does not seem to be enough to promote friendships between children with and without disabilities (Diamond, 2001) or ensure peer social acceptance (Odom et al., 2006). ECEC teachers may, thus, play a fundamental role in facilitating the development and maintenance of such positive relationships for children with disabilities.

Children's disability profile may impact the extent to which they are chosen to play by their typically developing peers (Yu, Ostrosky, & Fowler, 2014). For example, previous research suggests children with physical disabilities are less likely to be chosen to participate in an activity requiring motor skills by normally developing children (Diamond, Hong, & Tu, 2008) and it also seems that children without disabilities tend to choose to play with children with disabilities more often if they do not identify them as having disabilities (Yu et al., 2014). However, few studies focusing on the degree of

severity of children's disability have found mixed findings, with Buysse et al. (2002) not finding associations with the number of friends and Aguiar et al. (2010) reporting negative associations with peer acceptance. Note that children's social and language skills have been identified as factors likely to protect children with disabilities from peer relationship difficulties (Son et al., 2014). Likewise, social and self-regulatory skills of children with disabilities enhance their peer acceptance and friendships (Meyer & Ostrosky, 2016). On the other hand, having at least one best friend seems to partially mediate the relationship between problem behaviors and social rejection: children with disabilities with fewer social skills and more problem behaviors who have at least one best friend have their risk of peer's social rejection decreased (Meyer & Ostrosky, 2016). Similar to children without disabilities, age and gender of children with disabilities also seem to influence children's peer experiences (Aguiar et al., 2010; Diamond et al., 2008; Vaughn et al., 2001).

In this study, we first aim to examine the relationship between teacher-child interactions and the social outcomes of children with disabilities, specifically friendship and peer social acceptance. Based on assumptions of the bioecological theory (Bronfenbrenner & Morris, 2006), and on disperse evidence on children's exposure to ECEC, as described above, we also aim to investigate the moderator effects of dosage on this association. We expect children with disabilities attending ECEC classrooms with higher-quality teacher-child interactions to exhibit higher social acceptance and more friends. Proportion of days absent and number of months with the lead teacher, will be tested as moderators. We expect to find stronger associations between teacher-child interactions and children's friendships and social acceptance when children miss fewer school days and have spent more months with the lead teacher in the classroom.

We further aim to investigate the associations between children's individual verbal, social, and behavioral skills and their social experiences of friendship and social acceptance, also assuming these relationships may be moderated by ECEC dosage. We hypothesize children with disabilities with more verbal and social competence, and fewer behavior problems have more friends and are more accepted by their peers. We further expect that children with less verbal, social, and behavioral skills that miss more school days or have spent less time with lead teacher have an increased risk of social rejection and isolation.

Method

This study is part of a broader research project, [REMOVED FOR BLIND REVISION], authorized by the National Authority for Data Protection (i.e., Comissão Nacional de Proteção de Dados) and by the General-Directorate of Education. All teachers and parents of participating children provided signed informed consent forms. Children's verbal assent was obtained and any refusals to participate were respected.

Participants

Participants were 86 children with disabilities (63 boys), attending 86 inclusive ECEC classrooms from the Metropolitan Area of Lisbon, Portugal. Their age ranged between 45 and 88 months (M = 67.53, SD = 10.54). Mothers' education varied considerably: 7% of mothers had less than four years of basic education, 18.6% of the mothers had four years of basic education, 9.4% of mother completed middle-school (i.e., 6 years of formal schooling), 16.2% of mothers had completed basic education (i.e., 9 years of formal schooling), 25.8% of mothers completed high-school (i.e., 12 years of formal schooling), and about 14% of mothers had a university degree. Teachers did not provide information about education of 9.3% of the mothers. ECEC classrooms were eligible to participate if they included at least one child who received special education or early childhood intervention services under Decree-Law no. 3/2008 or Decree-Law no. 281/2009 and 60% of the all children in the classroom had parental consent. One child with disabilities with parental consent was randomly selected per classroom to avoid nesting effects. Children with severe multiple disabilities were excluded. According to teachers' report, 29% of the children had developmental delay, 22% had autism spectrum disorders, 9% had a rare disorder (e.g., Guillian-Barré syndrome, WAGR Syndrome, Goldenhar Syndrome), 8% had speech or language impairments, 5% had cerebral palsy, 4% had Down syndrome, 2% had multiple disabilities, 2% had emotional disabilities, 9% had other disabilities, 6% had no diagnosis (e.g., ongoing assessment), and for 4% of the children, teachers did not provide information. Degree of disability was rated by teachers, with the ABILITIES Index (Simeonsson & Bailey, 2005), and when considering the highest level of difficulty across functionality domains, about 14% of the children presented a profound disability, 42% presented a severe disability, 31% had a moderated disability, 7% had a mild disability, 4% had a suspected disability, and 2% of the children were not rated by their teachers.Participated in this study 86 ECEC teachers (1 male), aged between 24

and 60 years old (*M* = 46.45, *SD* = 8.46). About 96% of participating teachers had at least one year of experience in inclusive classrooms and most (58%) did not have experience in Early Childhood Intervention or Early Childhood Special Education.With respect to type of center, 78% of participating ECEC classrooms were located in public preschools, 15% were located in private non-profit centers, and 7% were located in private for-profit centers. About 84% of the classrooms were mixed-aged (i.e., serving children between 3 and 5/6 years of age), 7% served four-year-olds, and 9% served five-year-olds. Group size ranged between 14 and 27 children (*M* = 21.30, *SD* = 2.53).

Measures and Procedures

Degree of disability. We obtained a composite score of children's degree of disability from the ABILITIES Index (Simeonsson & Bailey, 2005). The ABILITIES Index assesses children's functional abilities/disabilities in nine domains (19 items), namely, audition, behavior and social skills, intellectual functioning, limbs, intentional communication, tonicity, integrity of physical health, eyes, and structural status. Each ABILITIES Index domain was rated on a 6-point scale (1 = *normal ability*, 2 = *suspected difficulty*, 3 = *mild difficulty*, 4 = *moderate difficulty*, 5 = *severe difficulty*, and 6 = *profound difficulty*) by the classroom lead teacher. The following weights were used to calculate the composite score: audition = 1.8; social skills = 1.4; inadequate behavior = 1.7; intellectual function = 2.0; limbs, hands = 1.5; limbs, arms = 1.4; limbs, legs = 1.6; understanding = 1.2; communicating with others = 1.0; tonicity, tightness = 1.5; tonicity, looseness = 1.4; overall health = 1.5; vision = 1.7; and structural status = 1.3 (Grande & Aguiar, 2011). This measure has shown internal consistency, agreement among different informants, and convergent-discriminant validity in previous studies using Portuguese samples (e.g., Grande & Aguiar, 2011), as well as stability of ratings over time (Bailey, Simeonsson, Buysse, & Smith, 1993). In this study, internal consistency for the composite score was .81.

Verbal competence. The Portuguese adaptation of the Wechsler Preschool and Primary Scale of Intelligence - Revised (WPPSI-R; Wechsler, 2010) was used to assess children's verbal competence. We used the mean scores of four to five subtests of the verbal scale: information, arithmetic, vocabulary, similarities, and comprehension (optional). It was applied individually in a quiet room at the ECEC center. Verbal competence internal consistency was .92.

Social skills and problem behaviors. The teacher preschool version of the Social Skills Rating System (SSRS; Gresham & Elliott, 2007) was used to assess children's social skills and problem behaviors. Similarly to the previous studies (e.g., Aguiar et al., 2010) two scales were used: social skills (α = .93) and problem behaviors (α = .82). Two subscales of problem behavior may also be obtained: externalizing behaviors (α =.85) and internalizing behaviors (α = .68). Teachers rated the frequency of children's behavior (0 = *never*, 1 = *sometimes*, 2 = *very often*) for a total of 40 items (30 items for social skills, 10 items for problem behaviors, including six items for externalizing behaviors, and four for internalizing behaviors). High scores on social skills identify children with higher social skills and high scores on problem behaviors identify children with more problem behaviors.

Friendship. Friendship data were collected in a separate room at the ECEC center at least four months after the beginning of the school year, to allow children's peer relationships to become stable. Individual sociometric interviews were conducted with all children in the classroom with parental consent. During these interviews, two different sociometric procedures were conducted: peer nominations and peer ratings. Using photographs of all children in each classroom, we first conducted the peer nomination task, asking children to make three positive nominations ("like to play the most") and three negative nominations ("like to play the least"). We then proceeded with the peer ratings task, asking children to sort peer photos into one of three boxes. Children were asked to place the photos of peers they "liked to play with a lot" (rating of 3) inside the box with a happy face; to place the photos of peers they "liked to play with sometimes" (rating of 2) in the box with a neutral face; and, finally, the photos of peers they "did not like to play with" (rating of 1) in a box with a sad face.

Children with disabilities were also invited to participate, except in two cases due to their disability profile (i.e., affecting vision or communication). Six children with disabilities did not understand the sociometric tasks and one child left the center prior to the sociometric data collection (resulting in missing data for friendship data).

Data were recorded in two sociometric matrixes for each classroom, one matrix for peer nominations and other for peer ratings. These matrixes were transformed into a single matrix, which identified children's reciprocal friendships, based on reciprocal positive nominations and positive ratings, cumulatively. Therefore, in this study, reciprocal friendships were identified only when a child with disabilities both

nominated and rated positively a peer and, in turn, the same peer nominated and rated positively the child with disabilities. These measures have been largely used (see Meyer & Ostrosky, 2016; Yu, Ostrosky, & Fowler, 2012).

Social acceptance. Individual children's social acceptance scores were obtained as the standardized score (*z* score) of the sum of all peer ratings in each classroom.

Teacher-child interactions. The Classroom Assessment Scoring System (CLASS) (Pianta et al., 2008) is an observational measure designed to assess the quality of teacher-child interactions. CLASS is organized into three domains, namely, emotional support, classroom organization, and instructional support. Emotional support (α = .90) comprises four dimensions: positive climate, negative climate, teacher sensitivity, and regard for student perspectives. Classroom organization (α = .86) includes three dimensions: behavior management, productivity, and instructional learning formats. Finally, instructional support (α = .87) includes three dimensions: concept development, quality of feedback, and language modeling.

Observations began at the beginning of the school day (i.e., morning) and, in each classroom, four observation cycles were conducted, as recommend by the authors. Each cycle lasted about 30 minutes, with 20 minutes for observation and 10 minutes for scoring. Observers rated CLASS dimensions on a Likert 7-point scale (1-2 = *low quality*, 3-5 = *middle quality*, and 6-7 = *high quality)*. For each dimension, the mean score across the four cycles was calculated. A mean score was computed for each CLASS domain and an overall score of teacher-child interactions (α = .92) was computed has the mean of all 10 dimensions. Four observers previously trained and certified for the Pre-K CLASS version conducted all observations. Reliability checks were performed in about 25% of participating classrooms, resulting in ICCs ranging from .57 (instructional support) and .68 (emotional support). ICC for the overall CLASS score was .63.

ECEC dosage. Children's exposure to ECEC was measured using two different indicators, based on teachers' report: proportion of days absent and number of months with the lead teacher.

Results

Descriptive statistics

Table 1 displays means and standard deviations of children's characteristics, social outcomes, and teacher-child interactions. Children with disabilities had average-level social skills and externalizing problem behaviors, while displaying low levels of internalizing behaviors. Regarding social outcomes, results showed children with disabilities had low social acceptance and few reciprocal friendships. About 56% of children had no friends, 26% had one friend, 7% had two friends, and 12% did not participate in or understand the sociometric tasks.

Table 1. *Descriptive statistics*

	M	*SD*	Min.	Max.	*N*
Degree of disability	57.54	16.94	31.00	110.70	83
Verbal competence	5.95	3.23	1.00	15.00	81
Social skills	0.95	0.39	0.07	1.85	86
Problem behaviors	0.76	0.40	0.00	1.90	86
Externalizing behavior	0.97	0.53	0.00	2.00	86
Internalizing behavior	0.45	0.42	0.00	1.75	86
Months with lead teacher	15.89	11.50	3.10	45.00	84
Proportions of days absent	0.07	0.06	0.00	0.27	84
Friendships	0.45	0.64	0.00	2.00	76
Social acceptance	-0.55	1.00	-2.63	2.03	84
Teacher-child interactions	3.99	0.63	2.65	5.58	85
Emotional support	5.01	0.81	2.88	6.69	85
Classroom organization	4.92	0.80	3.33	6.42	85
Instructional support	1.69	0.48	1.00	3.25	85

Proportion of days absent varied considerably (with three children not missing a single day but at least one child missing almost one third of all school days), despite the fact that the mean proportion of days absent seems to be low. On average, participating children with disabilities spent more than a year with the lead teacher of the classroom.

Scores of teacher-child interactions suggest middle-quality levels for emotional and classroom organization and low-quality levels for instructional support. About 7% of the children experienced low-quality teacher-child interactions and 93% of the children experienced middle-quality teacher-child interactions.

As showed in Table 2, Pearson correlation coefficients among variables indicated children's degree of disability was positively correlated with the proportion of days absent (moderate effect), overall teacher-child interactions, emotional support, and classroom organization (weak effect); and negatively correlated to children's verbal competence and friendship (moderate effect). Verbal competence was positively correlated with mother and father's education, social skills, and friendship (moderate effects). Social skills were positively correlated with friendship (moderate effect) while problem behaviors were negatively correlated with social acceptance (moderated effect) and positively related to sex (moderated effect). Social acceptance was positively associated with classroom organization. To ensure parsimony and increase statistical power, based on the zero-order correlation matrix, fathers' education (due to strong correlations with mother education) and internalizing behavior problems (due to lack of association with both outcomes and main relevant predictors) were not included in subsequent analyses.

Table 2. *Pearson correlation coefficients among variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
1. Gender (1=boys)																	
2. Chronological age	-.05																
3. Mother education	-.07	-.21															
4. Father education	-.02	-.04	.72**														
5. Months with lead teacher	-.10	.23*	.07	.22													
6. Proportion of days absent	-.24*	-.05	-.07	.02	-.06												
7. Degree of disability	-.09	.07	-.04	.17	-.02	.33**											
8. Verbal competence	.02	-.16	.36**	.30*	.18	-.28*	-.34**										
9. Social skills	-.19	.20	-.05	.00	.08	-.07	-.17	.36**									
10. Problem behaviors	.29**	-.06	-.07	-.03	-.07	-.08	.18	.12	-.52**								
11. Externalizing	.22*	-.08	-.06	-.07	-.04	-.12	.13	.15	-.43**	.92**							
12. Internalizing	.28*	.00	-.05	.06	-.08	.04	.19	-.01	-.44**	.67**	.33**						
13. Friendships	.19	-.10	.18	.04	.07	-.25*	-.28*	.46**	.28*	-.19	-.19	-.10					
14. Social acceptance	-.14	-.20	.24*	.15	-.05	.10	.12	.01	.04	-.30**	-.31**	-.14	.34**				
15. Teacher-child interactions	.00	-.09	.06	.02	-.14	-.05	.23*	-.12	.03	-.06	-.03	-.08	-.11	.17			
16. Emotional sup.	.10	-.16	.11	.03	-.13	-.01	.22*	-.07	-.03	.00	.00	-.01	-.11	.14	.94**		
17. Classroom org.	-.08	-.07	.08	.08	-.21	-.04	.25*	-.15	.06	-.11	-.09	-.09	-.09	.26*	.90**	.77**	
18. Instructional sup.	-.08	.06	-.11	-.13	.03	-.12	.10	-.10	.08	-.06	.00	-.16	-.09	.01	.73**	.57**	.54**

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

Associations between teacher-child interactions and children's friendship and social acceptance: The moderator role of dosage

Multiple regression analyses were conducted to test the associations between teacher-child interactions and children's social acceptance and friendship, investigating the hypothesized moderating effects of dosage. A set of three models were tested for each social outcome: the first model included chronological age, mothers' education, degree of disability, verbal competence, social skills, externalizing behavior, proportion of days absent, number of months with the lead teacher and teacher-child interactions; the second model included Model 1 predictors but also tested the moderating effects of the proportion of days absent; and the third model included Model 1 predictors but tested the moderating effects of the number of months with the lead teacher.

Regarding social acceptance, the first model (see Table 3) indicated a statistically significant negative effect of externalizing behavior ($F(9,62) = 2.24$, $p = .03$, $R^2_a = .14$). The second model was not statistically significant. The third model simply replicated the statistically significant negative main effect of externalizing behavior on children's social acceptance, $F(10,61) = 2.16$, $p = .03$, $R^2_a = .14$. Therefore, teacher-child interactions were not associated with the social acceptance of children with disabilities nor did we find evidence of moderating effects of two measures of ECEC dosage.

Table 3. *Summary of multiple regression analyses for testing the moderating effect of dosage on the relationship between teacher-child interactions and social acceptance of children with disabilities*

	Model 1			Model 2			Model 3		
	B	*SE*	*β*	*B*	*SE*	*β*	*B*	*SE*	*β*
Chronological age	-0.02	0.01	-.15	-0.02	0.01	-.15	-0.02	0.01	-.16
Maternal education	0.07	0.04	.24	0.07	0.04	.24	0.07	0.04	.23
Degree of disability	0.00	0.01	.08	0.00	0.01	.08	0.00	0.01	.08
Verbal competence	-0.03	0.05	-.10	-0.03	0.05	-.10	-0.03	0.05	-.10
Social skills	0.33	0.38	.12	0.33	0.38	.12	0.23	0.39	.09
Externalizing behaviors	-0.56	0.24	-.31*	-0.56	0.24	-.31*	-0.67	0.25	-.37*
Months with lead teacher	0.00	0.01	-.01	0.25	2.18	.01	0.37	2.15	.02
Proportion of days absent	0.26	2.15	.02	0.00	0.01	-.01	0.00	0.01	-.03
Teacher-child interactions	0.27	0.19	.17	0.27	0.19	.17	0.23	0.19	.14
Teacher-child interactions * Proportion of days absent				0.12	3.18	.00			
Teacher-child interactions * Months with lead teacher							0.02	0.02	.15
R^2		.25			.25			.26	
F for chance in R^2		2.24 *			1.98			2.16 *	

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

Regarding friendships (see Table 4), despite the fact that the first model was statistically significant ($F(9,57) = 2.24$, $p = .03$, $R^2_a = .15$), no effects were found for any of the predictors. Further, as found for social acceptance, the model testing the moderator effects of the proportion of days absent was not statistically significant. The third model was statistically significant $F(10,56) = 2.12$, $p = .04$, $R^2_a = .15$, but only a positive main effect of verbal competence was found. Therefore, teacher-child interactions were not associated with the number of friends of children with disabilities nor did we find evidence of moderating effects of two measures of ECEC dosage.

Table 4. *Summary of multiple regression analyses testing the moderating effect of dosage on the relationship between teacher-child interactions and friendships of children with disabilities*

	Model 1			Model 2			Model 3		
	B	*SE*	β	*B*	*SE*	β	*B*	*SE*	β
Chronological age	0.00	0.01	.00	0.00	0.01	.00	0.00	0.01	.01
Maternal education	0.01	0.03	.04	0.01	0.03	.03	0.01	0.03	.03
Degree of disability	0.00	0.01	-.10	0.00	0.01	-.10	0.00	0.01	-.09
Verbal competence	0.06	0.03	.31	0.06	0.03	.31	0.07	0.03	.33*
Social skills	0.23	0.26	.12	0.23	0.27	.12	0.28	0.27	.15
Externalizing behavior	-0.06	0.16	-.05	-0.06	0.16	-.05	0.00	0.17	.00
Months with lead teacher	0.00	0.01	.01	0.00	0.01	.02	0.00	0.01	.03
Proportion of days absent	-1.39	1.62	-.12	-1.42	1.64	-.12	-1.52	1.62	-.13
Teacher-child interactions	-0.12	0.13	-.12	-0.12	0.13	-.12	-0.10	0.13	-.09
Teacher-child interactions * Proportion of days absent				0.35	2.27	.02			
Teacher-child interactions * Months with lead teacher							-0.01	0.01	-.13
R^2		.26			.26			.28	
F for Change in R^2		2.24*			1.99			2.12*	

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

Associations between children's social skills / behavior problems / verbal competence and friendship and social acceptance: The moderator role of dosage

Finally, multiple regression analyses were conducted to investigate the hypothesized moderating effects of ECEC dosage on the associations between children's verbal competence, social skills, and externalizing behavior problems and children's social acceptance and friendship. For this purpose, two additional models were tested for each social outcome: the first model tested the moderating effects of the proportion of days absent; and the second model tested the moderating effects of the number of months with the lead teacher. Both models included the same predictors previously tested.

The first model presented in Table 5 revealed moderating effects of the proportion of days absent in the associations between children's verbal competence and children's externalizing behavior and their social acceptance ($F(12,59) = 4.33$, $p = .00$, $R^2_a = .36$). Interestingly, none of these variables presented a direct effect on social acceptance. Further, only in this model did we find positive effects for maternal education, degree of disability, and teacher-child interactions.

Table 5. *Summary of multiple regression analyses testing the moderating effect of dosage on the relationship between children's verbal, social, and behavioral competences and children's acceptance.*

	Model 1			Model 2		
	B	*SE*	β	*B*	*SE*	β
Chronological age	-0.01	0.01	-.14	-0.02	0.01	-.15
Maternal education	0.09	0.03	.28*	0.06	0.04	.21
Degree of disability	0.02	0.01	.26*	0.01	0.01	.09
Verbal competence	-0.05	0.04	-.18	-0.04	0.05	-.13
Social skills	0.60	0.33	.22	0.49	0.41	.18
Externalizing behaviors	-0.42	0.22	-.23	-0.54	0.24	-.30*
Months with lead teacher	0.00	0.01	-.05	0.00	0.01	-.03
Proportion of days absent	-1.82	1.94	-.11	0.12	2.21	.01
Teacher-child interactions	0.33	0.16	.21*	0.25	0.20	.16
Verbal competence * Proportion of days absent	-2.78	0.82	-.44*			
Social skills * Proportion of days absent	9.69	6.53	.21			
Externalizing behaviors * Proportion of days absent	17.55	5.66	.43*			
Verbal competence * Months with lead teacher				0.01	0.00	.20
Social skills * Months with lead teacher				-0.10	0.61	-.02
Externalizing behaviors * Months with lead teacher				-0.01	0.02	-.07
R^2		.47			.29	
F for Change in R^2		4.33**			1.99*	

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

Figure 1 plots the moderator effects of proportion of days absent in the relationship between externalizing behavior and social acceptance. Findings suggest children with low levels of externalizing behavior seem to benefit from missing fewer school days while for children with high levels of externalizing behavior, increased attendance (i.e., lower proportion of days absent) seems to be associated with lower peer social acceptance.

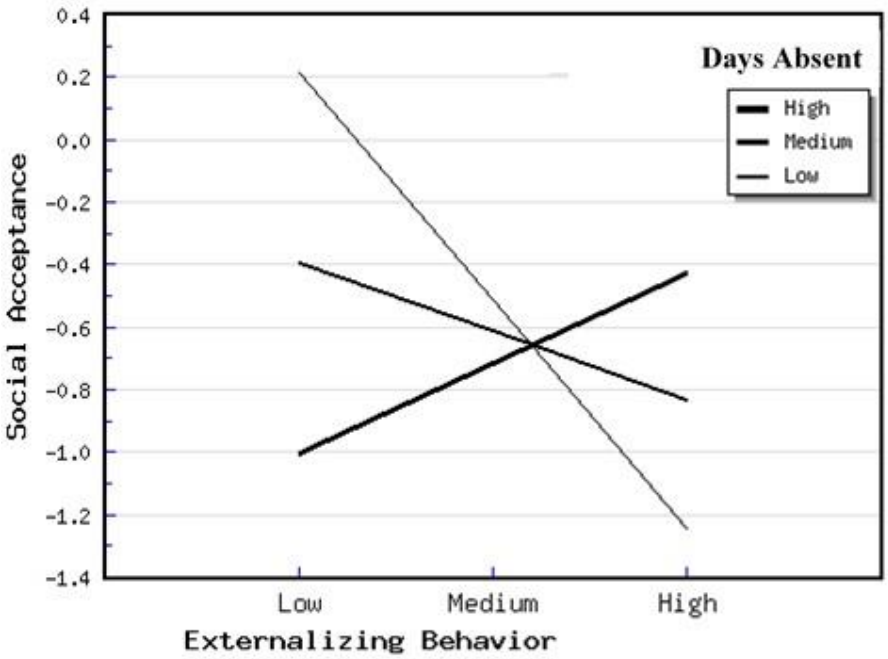

Figure 1. Moderating effects of proportion of days absent in the relationship between externalizing behavior and social acceptance.

Figure 2 plots the moderator effects of proportion of days absent in the relationship between verbal competence and social acceptance. In this case, children with high verbal competence seem to benefit from missing fewer school days while for children with lower verbal competence, increased attendance (i.e., lower proportion of days absent) seems to be associated with lower peer social acceptance.

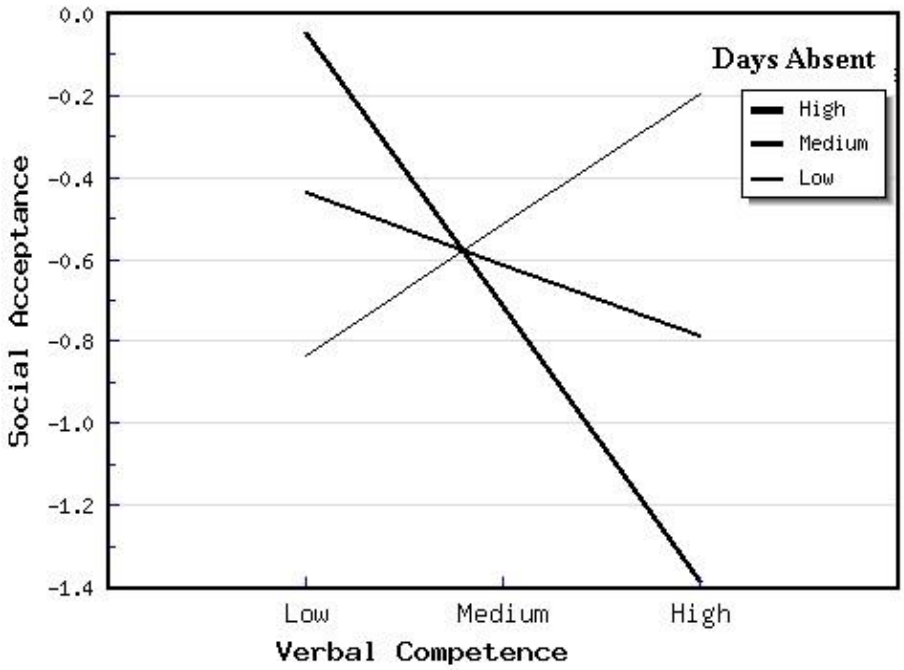

Figure 2. Moderating effects of proportion of days absent in the relationship between verbal competence and social acceptance.

Regarding friendship (see Table 6), the two models tested were statistically significant: $F(12,) = 2.82$, $p = .01$, $R^2_a = .25$; $F(12,54) = 2.13$, $p = .03$, $R^2_a = .17$, respectively. The second model revealed a positive main effect of children's verbal competence as well as moderating effects of the number of months with the lead teacher in the association between externalizing effects and number of friends.

Table 6. *Summary of multiple regression analyses testing the moderating effect of dosage on the relationship between children's verbal, social, and behavior competences and children's friendships*

	Model 1			Model 2		
	B	*SE*	*β*	*B*	*SE*	*β*
Chronological age	0.00	0.01	-.03	0.00	0.01	-.03
Maternal education	0.03	0.03	.13	0.00	0.03	-.02
Degree of disability	0.00	0.01	-.03	0.00	0.01	-.07
Verbal competence	0.05	0.03	.22	0.07	0.03	.33*
Social skills	0.38	0.25	.21	0.33	0.28	.18
Externalizing behaviors	-0.01	0.16	-.01	-0.09	0.16	-.08
Months with lead teacher	0.00	0.01	.02	0.00	0.01	-.03
Proportion of days absent	-1.06	1.54	-.09	-1.07	1.60	-.09
Teacher-child interactions	-0.13	0.12	-.12	-0.04	0.14	-.03
Verbal competence * Proportion of days absent	-0.09	0.64	-.02			
Social skills * Proportion of days absent	-9.40	5.10	-.28			
Externalizing behaviors * Proportion of days absent	4.13	4.49	.14			
Verbal competence * Months with lead teacher				0.00	0.00	.03
Social skills * Months with lead teacher				0.14	0.46	.04
Externalizing behaviors * Months with lead teacher				-0.03	0.01	-.28*
R^2		.39			.32	
F for change in R^2		2.82**			2.13*	

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

As suggested by Figure 3, children with lower levels of externalizing behavior seemed to have more friends when exposed more months to the lead teacher (when controlling for the quality of teacher-child interactions) while the inverse pattern was found for children with higher levels of externalizing behavior.

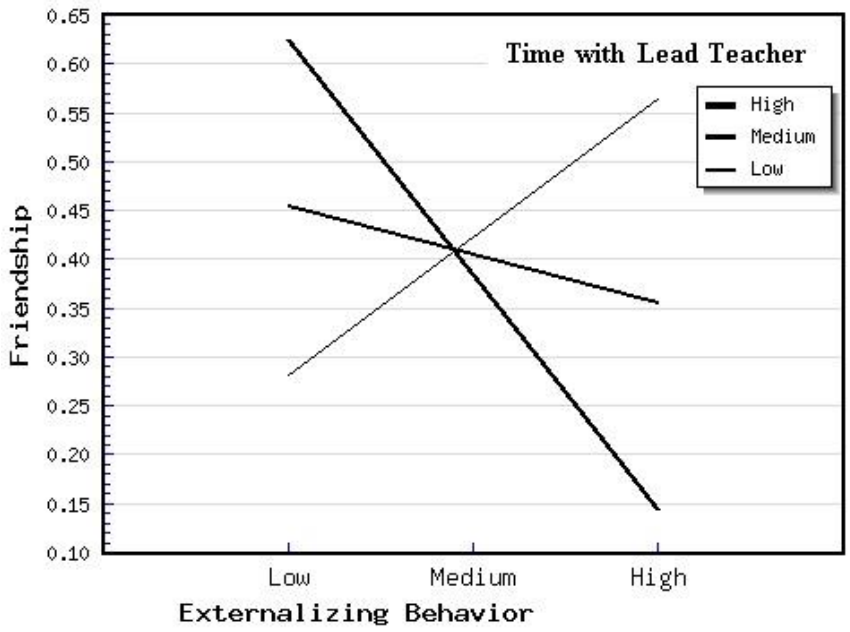

Figure 3. Moderating effects of number of months with lead teacher in the relationship between externalizing behavior and friendship.

Discussion

This study examined the relationship between teacher-child interactions and two social outcomes of children with disabilities - friendship and peer social acceptance - while testing the moderator effects of dosage. It also investigated the associations between children's verbal, social, and behavioral skills and their friendships and social acceptance, also assuming these relationships could be moderated by ECEC dosage.

Similar to previous research, children with disabilities in this study have few friends (e.g., Guralnick et al., 1996) and relatively low levels of social acceptance (Aguiar et al., 2010; Odom et al., 2006). Teacher-child interactions were not consistently associated with children's social acceptance and friendships (i.e., in a total of 5 models tested for each outcome, only once were teacher-child interactions associated with children's social acceptance) and none of the indicators of ECEC dosage investigated moderated this association. Therefore, our findings do not support the hypotheses derived from our first goal and based on previous studies relating teacher-child interactions with children's social development (e.g., Mashburn et al, 2008; Mikami et al., 2012). It is possible that the average quality levels of teacher-child

interactions quality found in this sample - moderate quality - are not enough to directly impact children's social outcomes at the dyadic and group level. Consistent with this hypothesis, Burchinal et al. (2010) found that low and moderate-quality interactions do not improve the outcomes of children at risk, reporting the need for high-quality interactions for positive associations to emerge. It is also possible that children with disabilities require more intensive and individualized interventions to show gains in peer-related social outcomes (see Brown, Odom, & Conroy, 2001).

When examining the associations between children's individual skills and their friendships and social acceptance, we found externalizing behaviors were consistently negatively associated with peer social acceptance, after controlling for covariates. This finding is consistent with previous reports (e.g., Meyer & Ostrosky, 2016) and was expected. Interestingly, this effect was not found for children's friendships, which supports the diverse nature of these constructs, with externalizing behavior problems influencing group-level social outcomes but not dyadic relationships. For friendship, a positive main effect of verbal competence was found in both models testing the moderation effects of the number of months with the lead teacher. This association is congruent with previous literature suggesting children with poor language skills struggle with peer relationship difficulties (Son et al., 2014). Contrary to what was expected (Meyer & Ostrosky, 2016; Son et al., 2014), we did not find direct or moderated effects of social skills on children's social acceptance or friendships.

We further hypothesized ECEC dosage could moderate the associations between children's verbal, social, and behavior skills and their friendships and social acceptance. We did find evidence of moderation effects of ECEC dosage on some of these associations. However, the direction of the moderation effect diverged from our initial expectations. According to our findings, children with lower verbal competence and more behavior problems seem to have an increased risk of social rejection when they actually attend more school days. Further, we found an interaction effect between children's externalizing behavior and the number of months with the lead teacher when investigating the predictors of children's friendships. Specifically, children with high levels of externalizing behavior had more friends when spending fewer months with the lead teacher while children with lower levels of externalizing behaviors seemed to have more friends when spending more months with the lead teacher.

Collectively, these findings suggest exposure to ECEC matters, but in an unexpected way: simply increasing the attendance of children with disabilities or ensuring prolonged exposure to a particular teacher does not ensure group-level social outcomes or enhance dyadic relationships of children with more verbal and behavioral difficulties. More time with the peer group or with a particular teacher may actually be detrimental in establishing friendships and being accepted by the peer group, at least in the context of moderate-quality teacher-child interactions. Children struggling with behavioral and language issues that actually spend more time in the classroom (i.e., miss fewer days) should, therefore, be specifically targeted for intervention aiming to promote group membership.

Successful inclusion likely requires teachers to positively manage children's behavior while supporting children's social relationships over time. Interestingly, research suggests teachers are more likely to implement incidental (vs. intentional) strategies to support the friendships of children with disabilities, despite their belief in the importance of this type of relationship (Hollingsworth & Buysse, 2009). More passive strategies such as allowing children to choose peers for specific activities or providing free choice opportunities seem to be preferred, likely because teachers believe they should not interfere in children relationships (Buysse, Goldman, & Skinner, 2003).

Further, in a previous study with this dataset [REMOVED FOR BLIND REVISION], we found teachers' reports on children's sociometric status (i.e., as rejected, neglected, controversial, average, or popular among peers) were not associated with sociometric status based on peer sociometric nominations. This finding may reflect teachers' lack of awareness of the social rejection processes experienced by children with disabilities, which in turn may hinder teacher's efforts to support children's friendships and social acceptance over time.

Limitations

This study has limitations that should be acknowledged and considered while discussing our findings. First, we acknowledge the small size and regional scope of our community-based ECEC sample. The limited sample and vast array of disabilities of participating children also prevented the conduction of analyses considering children's type of disabilities. Despite the fact that we controlled for the severity of children's disabilities, a closer examination of children's disability profile was not possible. Second, our cross-sectional correlational design that does not allow us to establish

causal effects or unequivocally establish the direction of the associations reported here. Third, while we considered two indicators of children's ECEC dosage – number of months with the lead teacher and proportion of days absent – we did not control the amount of time (i.e., frequency and duration) children with disabilities spent outside their classrooms in order to receive early childhood special education / early childhood intervention pull-out services. Note that previous research has reported benefits for children served in in-class support models when compared with children experiencing pull-out services (Vlachou & Fyssa, 2016). Son and colleagues (2014) also found negative effects of pull-out services for children with disabilities, reporting that children who spend more time in special education classrooms have poorer language and less social skills, which is likely to increase their difficulties in peer relationships. Therefore, future research should also account for the amount of time spent outside the classroom for pull-out services, when children are present in the center. Fourth, while we used children's reports to identify reciprocal friendships, instead of parents' and teachers' reports (e.g., Buysse, 1993), which can be considered an important contribution to the literature in this domain (Meyer & Ostrosky, 2014), the criterion used to identify reciprocal friendships was conservative and may have underestimated the number of reciprocal friendships experienced by our participants. The number of friends of children with disabilities identified in the study was lower than that reported by Guralnick et al. (1996), but similar to that reported by Meyer and Ostrosky (2016), based on a less severe criterion (only mutual nominations). Finally, our study does not add to the understanding of the social experiences of children with the most severe disabilities, who were either excluded based on sample selection criteria or could not participate or understand the sociometric tasks, resulting, therefore, in missing data regarding friendships.

Conclusions and implications

In conclusion, children with disabilities attending inclusive ECEC settings in the area of Lisbon, Portugal, experience medium quality teacher-child interactions and seem to struggle with dyadic and group-level dimensions of social inclusion. The lack of effects of teacher-child interactions on the social outcomes tested here may suggest the need to improve ECEC process quality to levels more likely to impact children's development (Burchinal et al., 2010). Externalizing behavior and verbal competence were related to children's social inclusion outcomes but these associations were

moderated by ECEC dosage. The somewhat counterintuitive effects of dosage reported here (i.e., more time in ECEC associated with lower social acceptance for children with higher externalizing behaviors and lower verbal competence) seem to suggest simply spending more time in ECEC settings is not sufficient for positive social outcomes to emerge and that, over time, children with more externalizing behaviors and lower verbal competence, may need additional – likely more intensive and individualized – supports to develop and maintain friendships and be accepted in the peer group.

These findings seem to reinforce the importance of the recent Policy Statement on Inclusion of Children with Disabilities in Early Childhood Programs (U.S. Health and Human Services & U.S. Department of Education, 2016), which highlights the importance of teacher knowledge regarding strategies to support children's socio-emotional development, decrease challenging behavior, and engage children in high-quality interactions. This Policy Statement emphasizes children's socio-emotional development and behavioral health as priorities in teacher training in order to overcome barriers to social inclusion. Given our findings, these orientations may also be relevant for Portuguese ECEC settings, where interventions aiming to support children's social emotional competence (e.g., Hemmeter, Snyder, Fox, & Algina, 2016) as a means to support children friendships and social acceptance seem to be warranted.

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CHAPTER IV

Social Skills and Behavior Problems of Preschoolers with Disabilities: Examining Moderating Effects of Teacher-Child Interactions and Dosage [1]

[1] Ferreira, M., Aguiar, C., Correia, N., Fialho, M., & Pimentel, J. S. (2016). Social skills and behavior problems of preschoolers with disabilities: Examining moderating effects of teacher-child interactions and dosage. Manuscript submitted for publication.

Abstract

Social and behavioral competences of children with disabilities have been considered an important goal to improve children social inclusion. In this study, we examined the extent to which teacher-child interactions or ECEC dosage moderate the association between children's degree of disability and their social skills and behavior problems. Participated in the study 42 children with disabilities (30 boys; M_{age} = 68.25, *SD* = 10.21), enrolled in 42 inclusive classrooms from the Metropolitan Area of Lisbon, Portugal. *Research findings:* Social skills were neither predicted nor moderated by teacher-child interactions or dosage. Teacher-child interactions and, specifically, emotional support moderated the association between children's degree of disability and problem behaviors. In classrooms with lower-quality teacher-child interactions and lower emotional support, children with less severe disabilities displayed higher levels of problem behaviors while children with more severe disabilities displayed lower levels. Instructional support, classroom organization, and ECEC dosage neither predicted nor moderated this association. *Practice or Policy:* Children with disabilities are a special group that possibly requires even higher quality and individualized interventions to improve their social outcomes. Professional development should focus on enhancing classroom interactions to levels that impact children social-behavioral development.

Keywords: teacher-child interactions, children with disabilities, social skill, problem behaviors, dosage

Introduction

Social-emotional development and appropriate behavior have been identified as important goals to improve children's social experiences in inclusive early childhood education and care (ECEC) settings (DEC/NAEYC, 2009). Because children with disabilities struggle with peer-related social competence (Guralnick, 2010) and peer relationships (e.g., Odom et al., 2006) and because children with disabilities seem to have more emotional and behavioral difficulties than children without disabilities (Emerson & Einfel, 2010), socio-behavioral skills may be critical to enhance the social inclusion of children with disabilities (Meyer & Ostrosky, 2016).

Positive teacher-child interactions organize children's experiences (Pianta, Hamre, & Allen, 2012) and constitute a basic mechanism of their social development (Mashburn et al., 2008). Recent findings describe the positive impact of the quality of teacher-child interactions on the social competence and problem behaviors of children without disabilities (e.g., Mashburn et al., 2008), with effects persisting until adolescence (Vandell et al., 2010).

Previous research suggests global quality (Grisham-Brown, Cox, Gravil, & Missall, 2010) and teacher-child interactions (Hestenes, Cassidy, Shim, & Hegde, 2008) seem to be higher in inclusive preschool classrooms. Further, the individual experiences of children in inclusive classrooms seem to be associated with the quality of their relationships with teachers (Jeon et al., 2010). The Teaching Through Interactions framework focuses on teacher-child interactions as central dimensions of ECEC classroom quality, instead of considering the physical conditions, safety, curriculum, or materials in the classroom (Pianta, La Paro, & Hamre, 2008). According to this framework, the quality of teacher-child interactions can be conceptualized in three major domains, namely emotional support, classroom organization, and instructional support (Pianta et al., 2008). These process quality domains have been reported to be more consistent and stronger predictors of children's cognitive and socioemotional development than measures of global quality such as those obtained with the Environment Rating Scales (Mashburn et al., 2008).

In effective emotionally supportive classrooms, teachers promote and scaffold children's social and emotional functioning as well as the interactions between all those in the classroom (e.g., Downer, Sabol, & Hamre, 2010; Pianta et al., 2012). A positive

emotional climate is characterized by warm relationships between teachers and children, responsiveness to children's individual needs, interests, or motivations, and consideration for children's perspectives (e.g., Pianta et al., 2012). Further, children feel safe and seek the teacher as a source of support (e.g., Pianta et al., 2012).

Children's social-emotional development has been related to emotional support (Downer et al., 2010). Young children who experience high levels of emotionally supportive interactions with their teachers show higher ratings of social competence and lower ratings of problem behaviors (Curby et al., 2009; Mashburn et al., 2008). Emotional support not only appears to be a predictor of more social competence and less problem behaviors, but also seems to moderate children outcomes. Buyse and colleagues (2008) found a moderator effect of emotional support for children with high risk of establishing more conflictual or less close relationships, as a result of their externalizing and internalizing behaviors, with a positive impact of emotionally supportive teachers for children with more challenging behaviors (Buyse et al., 2008). Similarly, children with high risk of developing low prosocial behavior as result of family characteristics, seem to benefit from higher emotional support (Johnson, Seidenfeld, Izard, & Kobak, 2013). Further, children from low-income families, whose caregivers show high levels of depressive symptoms, attending classrooms with high emotional support, improved their prosocial behavior to levels similar to those of children with caregivers with low levels of depressive symptoms. Possibly, in these classrooms, teachers' sensitive and responsive interactions with children served as a model for improving their outcomes (Johnson et al., 2013).

However, research findings suggest a minimum level of quality may be needed to improve the developmental outcomes of children in more disadvantaged situations (Burchinal, Vandergrift, Pianta, & Mashburn, 2010). For example, Burchinal et al. found that while high-quality emotional support predicted more social competence and fewer problem behaviors, moderate to low levels of emotional support predicted more problem behaviors and did not predict social competence (Burchinal et al., 2010). This finding reinforces the potential critical importance of high levels of emotional support as a protective factor. However, emotional support effects seem to be consistently small or modest, despite being different from zero (Mashburn et al., 2008), with the variance explained for academic outcomes usually higher than for social competences (Curby et al., 2009).

Classroom organization has been shown to predict children's behavioral and cognitive self-control and engagement (Rimm-Kaufman, Curby, Grimm, Nathanson, & Brock, 2009). In classrooms with high ratings in this domain, teachers spend little time in transitions and management activities, engage children providing interesting activities, and promote positive behavior using active strategies to redirect or terminate misbehaviors (Pianta et al., 2012). Children know teacher expectations and develop their self-regulation (Downer et al., 2010) likely because in well-managed environments, with established routines, children know what to do and when (Rimm-Kaufman et al., 2009).

Academic and cognitive development has been associated with instructional support (Downer et al., 2010). In classrooms with high instructional support, teachers provide support to children's cognitive and language development, through concept development (using discussions, problem-solving and higher-order thinking), feedback about children's work and learning, and facilitation of appropriate language and scaffolding (Downer et al., 2010). Instructional support focuses on teacher strategies to foster development, not on curriculum (Pianta et al., 2008).

Interestingly, instructional quality in pre-kindergarten has been shown to predict children's social performance in kindergarten, providing evidence of cross-domain links to children's outcomes (Burchinal et al., 2008). Therefore, social skills seem to be associated with positive and sensitive teacher-child relationships but also benefit from teacher behaviors supporting children's communication, development of concepts, use of language, and providing appropriate feedback. These effect sizes, despite being statistically significant, were also small in magnitude (Mashburn et al., 2008). Note, however, that Rimm-Kaufman et al. (2009) found higher levels of instructional support predicted lower levels of cognitive self-control and lower levels of positive work habits, which may be related to teacher expectations and academic demands.

As proximal processes, teacher-child interactions likely need to happen frequently and over an extended period of time in order to positively impact children's development (Bronfenbrenner & Evans, 2000). Some studies report children seem to benefit from enrolling in ECEC classrooms with high levels of quality for more time (e.g., Zaslow et al., 2010). However, findings on ECEC dosage are not consistent for social outcomes, with some studies finding no evidence of dosage effects (e.g., Xue et al., 2016). Focusing on the social outcomes of children with disabilities, we previously

found ECEC dosage moderates the association between the children's individual verbal and behavioral skills and their social acceptance and friendship ([REMOVED FOR BLIND REVISION], 2016). Our findings actually suggest more time in ECEC - specifically, higher attendance rates - may actually be detrimental for peer social acceptance in the case of children with increased language and behavioral difficulties.

Research also suggests children from socio-economically disadvantaged families appear to benefit differently – that is, more – from higher amounts of time in high-quality ECEC classrooms, reflecting protective or compensatory (vs. cumulative) effects (e.g., Buyse et al., 2008; Johnson et al., 2013; Zaslow et al., 2010). Preschool children with disabilities have been described as being at high risk of social rejection as a result of presenting problem behaviors and fewer social skills (e.g., Meyer and Ostrosky, 2016). Therefore, despite having different characteristics, young children with disabilities are especially vulnerable and we believe it is likely that children with disabilities, namely those with more severe disabilities, may benefit more from high-quality ECEC and ECEC higher dosages.

In this study, we aim to investigate the extent to which teacher-child interactions moderate the associations between children's degree of disability and their social skills and behavior problems. We hypothesize main negative effects of children's degree of disability and main positive effects of teacher-child interactions (including emotional support, classroom organization, and instructional support), on children's social skills and problem behaviors. Based on a compensatory model, we hypothesize that children with more severe disabilities may benefit more from higher-quality teacher-child interactions, namely emotional support, classroom organization, and instructional support.

We also aim to investigate the extent to which ECEC dosage moderates the associations between children's degree of disability and their social skills and behavior problems. We hypothesize that children with higher attendance rates (i.e., lower proportion of days absent) and who have been with the lead teacher for more months (i.e., cumulative dosage) will have higher levels of social skills and lower levels of problem behaviors.

This study takes place in Portugal, a country with an inclusion-oriented special education framework, where about 99% of all children with disabilities attend regular

schools, with public schools serving 87% of these children (Direção-Geral de Estatísticas da Educação e Ciência, 2016), and where about 20% of preschool classrooms in public schools include at least one child with disabilities receiving early childhood intervention or early childhood special education (Inspeção-Geral de Educação e Ciência, 2015).

Method

Participants

Participated in this study 42 children with disabilities (30 boys) enrolled in 42 inclusive classrooms from the Metropolitan Area of Lisbon, Portugal. Children's age ranged between 46 and 87.7 months (M = 68.25, SD = 10.21). Mothers' education ranged from less than four years of basic education (2.4%) to a university degree (9.5%), with most mothers (31%) having a high-school diploma (i.e., 12 years of formal schooling).

Children with disabilities were eligible to participate if they received early childhood special education or early childhood intervention services under Decree-Law no. 3/2008 or Decree-Law n 281/2009 and had parental consent. For the purpose of avoiding nesting effects and reducing the amount of information required from teachers, one child with disabilities was randomly selected per classroom.

Based on their knowledge and records, participating teachers identified 17% of children as having a profound disability in at least one domain, 45% of children as having a severe disability, 21% of children as having a moderate disability, 7% of children as having a mild disability, and 5% of children as having a suspected disability (missing data for 5%). Based on teachers' report, 31% of children had developmental delay, 26% of children had an autism spectrum disorder, 7% of children had speech or language impairments, 7% of children had a rare disorder (i.e., DiGeorge syndrome, Hurler-Scheie syndrome, or Mosaic trisomy 8), 5% of children had Down syndrome, 10% of children had other disabilities, and 10% of children had no diagnosis (i.e., were receiving services, but their assessment was not concluded or had been inconclusive). Diagnoses information was missing for 5% of the children.

The lead teacher in each classroom participated in this study (n = 42; 1 male). Teachers' age ranged from 29 years to 60 years (M = 48, SD = 7.45). Most teachers had

at least one year experience in inclusive classrooms (91%) and about 64% had no experience in early childhood intervention or early childhood special education.

Classrooms were located in public preschools (88%), private non-profit centers (5%), and private for-profit centers (7%). The majority of classrooms were mixed-age (88%); about 5% of classrooms served four-year-old children, and 7% of classrooms served five-year-old children. The number of children per classroom ranged between 14 and 25 (M = 21.19, SD = 2.67).

Measures

Degree of disability. Using the ABILITIES Index (Simeonsson & Bailey, 1991/2005), teachers rated children's degree of disability in nine domains (19 items) - audition, behavior and social skills, intellectual functioning, limbs, intentional communication, tonicity, integrity of physical health, eyes, and structural status - using a 6-point scale (1 = *normal ability*, 2 = *suspected difficulty*, 3 = *mild difficulty*, 4 = *moderate difficulty*, 5 = *severe difficulty*, and 6 = *profound difficulty*). A composite score resulted from the sum of all domains, each one multiplied by the respective weight: audition = 1.8; social skills = 1.4; inadequate behavior = 1.7; intellectual function = 2.0; limbs, hands = 1.5; limbs, arms = 1.4; limbs, legs = 1.6; understanding = 1.2; communicating with others = 1.0; tonicity, tightness = 1.5; tonicity, looseness = 1.4; overall health = 1.5; vision = 1.7; and structural status = 1.3 (Grande & Aguiar, 2011). Internal consistency, informant agreement, and convergent-discriminant validity has been previously reported (e.g., Grande & Aguiar, 2011). The ABILITIES Index has also shown stability over time (Bailey, Simeonsson, Buysse, & Smith, 1993). In this study, internal consistency across all 19 items was .81.

Social skills and problem behaviors. Social skills and problem behaviors were assessed with the teacher preschool version of the Social Skills Rating System (SSRS; Gresham & Elliott, 1990/ 2007). Children's behavior frequency was assessed on a 3-point scare (0 = *never*, 1 = *sometimes*, 2 = *very often*) for a total of 40 items, which are related to social skills (30 items) and problem behaviors (10 items, six of them related to externalizing behaviors and four related to internalizing behaviors). Children with higher scores in social skills were socially more competent and children with higher scores in problem behaviors presented more behavior problems. This measure was completed two times by the teacher. In the first assessment, internal consistency was .95

for social skills and .84 for problem behaviors. In the second assessment, internal consistency was .94 for social skills and .81 for problem behaviors.

Teacher-child interactions. The Classroom Assessment Scoring System –Pre-K version (CLASS; Pianta et al., 2008) was used to assess the quality of teacher-child interactions in participating classrooms. The CLASS includes three domains: emotional support (composed of positive climate, negative climate, teacher sensitivity, and regard for student perspectives; α = .90) classroom organization (composed of behavior management, productivity, and instructional learning formats; α = .81), and instructional support (including concept development, quality of feedback, and language modeling; α = .86) (Pianta et al., 2008).

As recommended by the authors (Pianta et al., 2008), observations in each classroom started at the beginning of the preschool day and focused on teacher interactions and behavior. Four 30 min. cycles were conducted, including 20 minutes for observation and 10 minutes for coding. CLASS dimensions were rated on a Likert scale of 7-points (1-2 = *low quality*, 3-5 = *middle quality*, and 6-7 = *high quality).* Dimension scores were computed as the mean score of the four cycles; domain scores were computed as the mean score of the respective dimensions. Quality of teacher-child interactions was computed as the mean score of all dimensions (α = 92). Observers were trained and certified by Teachstone for CLASS coding. About 25% of classroom observations were independently scored by two observers obtaining the following intraclass correlation coefficients: .66 for emotional support, .60 for classroom organization, .56 for instructional support, and .61 for the global score of teacher-child interactions.

ECEC dosage. Children's ECEC dosage was measured through two indicators, based on teachers' report: proportion of days absent and number of months with the lead teacher.

Procedure

This study is part of a broader research project, [REMOVED FOR BLIND REVISION], authorized by the National Authority for Data Protection (i.e., Comissão Nacional de Proteção de Dados) and by the General-Directorate of Education. Signed informed consent forms were obtained from all teachers and parents of participating children.

Data collection was conducted in 2013/2014, during three separate moments: Time 1 data was collected between October 2013 and February 2014 (i.e., mostly Winter), Time 2 data was collected between February and April 2014, and Time 3 data was collected between May and June 2014 (i.e., mostly Spring), ensuring an interval of at least 5 months between Time 1 and Time 3 assessments for each child. We asked teachers to rate children's social skills and behavior problems at both Time 1 and Time 3. Classroom observations were conducted at Time 2.

Results

Descriptive statistics

Table 1 displays descriptive statistics for study variables. Children's social skills increased from Winter to Spring (Z = -2.17, p = .01, d = - 0.21), while problem behaviors decreased significantly ($t(39)$ = 1.76, p = .04, d = 0.27).

Table 1. *Descriptive Statistics of the Major Study Variables*

	M	*SD*	*Min.*	*Max.*	*N*
Age (months; Winter)	68.25	10.21	46.00	87.70	42
Degree of Disability	58.71	17.15	31.00	100.30	39
Social Skills					
Winter	0.95	0.43	0.07	1.85	42
Spring	1.04	0.42	0.40	1.93	40
Problem behaviors					
Winter	0.82	0.43	0.00	1.90	42
Spring	0.71	0.39	0.00	1.60	40
Time with lead teacher (months)	14.88	9.56	4.80	41.30	40
Proportion of days absent	0.07	0.06	0.00	0.27	40
Teacher-child interactions	4.06	0.60	2.78	5.58	41
Emotional Support	5.01	0.82	2.88	6.69	41
Classroom Organization	5.11	0.67	3.50	6,42	41
Instructional Support	1.76	0.47	1.00	3,25	41

Mean results for teacher-child interactions suggest medium quality levels, with emotional support and classroom organization displaying medium quality and instructional support presenting low quality. Dosage indicators suggest high variability in children's attendance, despite the fact that the mean proportion of days absent is low. The mean number of months with the lead teacher exceeded one year.

Correlation Coefficients

Correlations among variables are displayed in Table 2. Gender was strongly and negatively correlated with social skills and moderately and positively correlated to problem behaviors, in both assessments (Winter and Spring). Both Winter and Spring social skills were also moderately and positively correlated with age. Children's degree of disability was positively correlated with teacher-child interactions, and, specifically, emotional support and classroom organization (moderate effect); it was also negatively correlated with the number of months with the lead teacher. Interestingly, classroom organization was negatively correlated with the number of months with the lead teacher. We did not find associations between social skills or problem behaviors and teacher-child interactions, including the global score and emotional support, classroom organization, and instructional support.

Table 2. *Pearson Correlations Coefficients Among Study Variables*

	1	2	3	4	5	6	7	8	9	10	11	12	13	14
1. Gender (1=Boys)	-													
2. Age (months)	-.02	-												
3. Mother's Education	-.05	-.15	-											
4. Father's Education	.06	.04	.70**	-										
5. Degree of Disability	.09	-.22	.09	.16	-									
6. Social Skills (Winter)	-.50**	.32*	-.11	-.18	-.18									
7. Problem Behaviors (Winter)	.48**	-.22	-.16	.06	.24	-.67**								
8. Social Skills (Spring)	-.52**	.37*	-.09	.02	-.19	.87**	-.67**							
9. Problem Behaviors (Spring)	.37*	-.30	-.18	-.25	.13	-.54**	.80**	-.65**						
10. Proportion of days absent	-.12	-.14	.21	.18	.27	.05	-.20	-.04	-.17					
11. Time with lead teacher (months)	-.10	.16	.00	-.05	-.32*	.22	-.15	.23	-.12	-.37*				
12. Teacher-child interactions	.00	-.05	.09	.03	.38*	.03	-.01	.02	.03	.08	-.23			
13. Emotional Support	.11	-.12	.20	.09	.37*	-.02	.07	-.05	.08	.08	-.20	.95**		
14. Classroom organizat.	-.12	-.01	.05	.06	.43**	.02	-.06	-.02	.04	.18	-.40*	.90**	.78**	
15. Instructional Support	-.09	.08	-.16	-.14	.16	.16	-.13	.23	-.12	-.10	.06	.75**	.57**	.59**

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

Multiple regression analyses predicting social skills

In order to test the moderating effects of teacher-child interactions on the association between children's degree of disability and social skills, we performed multiple regression analyses. Due to the low sample size and strong associations among dimensions of teacher-child interactions, we tested four separate models. All models controlled for children's gender, age, and Winter social skills.

As shown in Table 3, all models were statistically significant, $F(6,32)=17.87$, $p < .001$, $R^2_a = .73$; $F(6,32)=18.00$, $p < .001$, $R^2_a = .73$; $F(6,32)=18.15$, $p < .001$, $R^2_a = .73$; $F(6,32)=18.85$, $p < .001$, $R^2_a = .74$. However, only a main effect for children's Winter social skills was found. Therefore, contrary to our expectations, neither children's degree of disability predicted children's social skills nor was this association moderated by teacher-child interactions.

Table 3. *Multiple Regression Analyses Predicting Social Skills in the Spring, Testing the Moderating Effects of Teacher-Child Interactions*

	Model 1			Model 2			Model 3			Model 4		
	B	*SE β*	*β*	*B*	*SE β*	*β*	*B*	*SE β*	*β*	*B*	*SE β*	*β*
Gender (1=Boys)	-.09	.10	-.09	-.09	.10	-.10	-.09	.10	-.09	-.10	.10	-.11
Age (months)	.00	.00	.11	.01	.00	.12	.00	.00	.11	.00	.00	.09
Social skills (Winter)	.76	.11	.79***	.76	.10	.79***	.77	.11	.80***	.72	.10	.75***
Degree of disability	.00	.00	-.01	.00	.00	.01	.00	.00	.02	.00	.00	-.05
Teacher-child interaction	.01	.07	.02									
Emotional support				.00	.05	.00						
Classroom organizat.							-.03	.06	-.04			
Instructional Support										.08	.08	.09
Degree of disability *Teacher-child interaction	.00	.00	-.04									
Degree of disability * Emotional support				0.00	.00	-.06						
Degree of disability * Classroom organizat.							.00	.00	-.06			
Degree of disability * Instructional Support										.08	.08	.09
R^2		.77			.77			.77			.78	
F for change in R^2		17.87***			18.00***			18.15***			18.85***	

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

Further, as displayed in Table 4, we also tested the moderating effects of ECEC dosage on the association between children's degree of disability and social skills, while controlling for children's gender, age, and previous social skills. However, children's social skills were not predicted by the interaction between degree of disability and proportion of days absent or number of months with the lead teacher, $F(6,32)=18.52$, $p < .001$, $R^2_a = .74$; $F(6,32)=17.83$, $p < .001$, $R^2_a = .73$.

Table 4. *Multiple Regression Analyses Predicting Spring Social Skills, Testing the Moderating Effects of Dosage*

	Model 1			Model 2		
	B	*SE β*	*β*	*B*	*SE β*	*β*
Gender (1=Boys, 0=Girls)	-.11	.09	-.11	-.09	.10	-.10
Age (months)	.01	.00	.12	.00	.00	.10
Social Skills (Winter)	.75	.10	.77***	.75	.10	.77***
Degree of disability	.00	.00	.01	.00	.00	-.01
Proportion of days absent	-.26	.83	-.03			
Time with lead teacher (months)				.00	.00	.03
Degree of disability * Proportion of days absent	-.02	.03	-.07			
Degree of disability * Time with lead teacher (months)				.00	.00	-.02
R^2		.78			.77	
F for change in R^2		18.55***			17.83***	

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

Multiple regression analyses predicting problem behaviors

We also performed a set of multiple regression analyses testing the moderating effects of teacher-child interactions on the associations between children's degree of disability and problem behaviors (see Table 5), controlling for children's age, gender, and Winter problem behaviors. In all models, Winter problem behaviors positively predicted Spring problem behavior levels. The first model, $F(6,32)=13.13$, $p < .001$, $R^2_a = .66$, showed a statistically significant interaction between children's degree of disability and teacher-child interactions. The moderation effect was plotted in ModGraph-I (Jose, 2013), with single slope computations indicating only the slope for low-quality teacher-child interactions was significant different from zero ($p = .02$).

Table 5. *Multiple Regression Analyses Predicting Spring Problem Behaviors, Testing the Moderating Effects of Teacher-Child Interactions*

	Model 1			Model 2			Model 3			Model 4		
	B	*SE β*	*β*	*B*	*SE β*	*β*	*B*	*SE β*	*β*	*B*	*SE β*	*β*
Gender (1=Boys)	-.13	.10	-.15	-.12	.10	-.14	-.11	.10	-.13	-.09	.10	-.11
Age (months)	-.01	.00	-.20	-.01	.00	-.21	-.01	.00	-.17	-.01	.00	-.15
Problem Behaviors (Winter)	.91	.12	.93***	.91	.12	.93***	.89	.12	.91***	.84	.12	.86***
Degree of disability	-.01	.00	-.22	-.01	.00	-.24	-.01	.00	-.23	.00	.00	-.12
Teacher-child interaction	.01	.07	.02									
Emotional support				.01	.05	.03						
Classroom organizat.							.08	.06	.13			
Instructional Support										-.01	.08	-.01
Degree of disability *												
Teacher-child interaction	.01	.01	.25*									
Degree of disability *				.01	.00	.25*						
Emotional support												
Degree of disability *							.01	.00	.21			
Classroom organization												
Degree of disability *										.01	.00	.12
Instructional Support												
R^2	.71			.71			.71			.68		
F for change in R^2	13.13***			12.90***			13.32***			11.35***		

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

As shown in Figure 1, children with less severe disabilities had higher levels of problem behaviors in classrooms with lower-quality teacher child interactions while children with more severe disabilities displayed lower levels of problem behaviors in such classrooms.

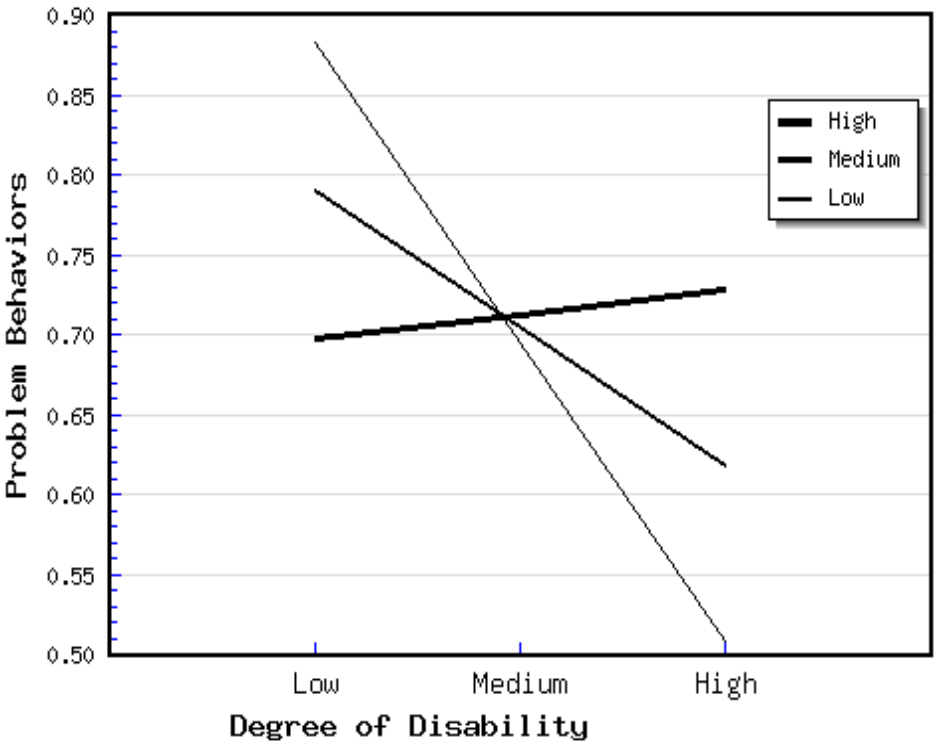

Figure 1. Moderating effects of teacher-child interaction in the relationship between degree of disability and problem behaviors.

Emotional support also moderated the effect of degree of disability on children's problem behaviors, $F(6,32)=12.90$, $p < .001$, $R^2_a = .65$. The effect was similar to that of the global score for teacher-child interactions (see Figure 2), with the slope for low emotional support significant different from 0 ($p = .02$). Children with less severe disabilities presented higher levels of problem behaviors in classrooms with low emotional support and children with more severe disabilities showed lower levels of emotional support in such classrooms. Despite the fact that the third and fourth models were statistically significant, $F(6,32)=13.32$, $p < .001$, $R^2_a = .66$, $F(6,32)=11.35$, $p <$

.001, R^2_a =.62, classroom organization and instructional support did not predict nor moderate levels of Spring problem behaviors.

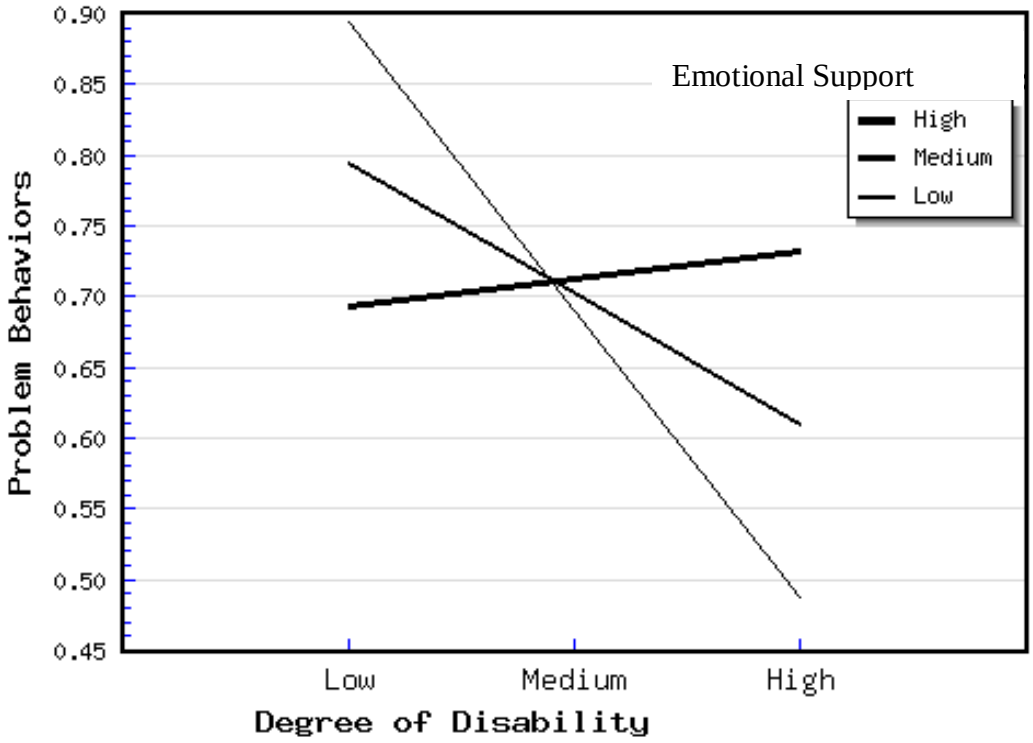

Figure 1. Moderating effects of emotional support in the relationship between degree of disability and problem behaviors.

Table 6 displays the results for multiple regression analyses testing the moderating effects of proportion of days absent and number of months with the lead teacher, $F(6,32)=10.97$, $p < .001$, R^2_a =.61, $F(6,32)=11.36$, $p < .001$, R^2_a =.62. Similarly to social skills, ECEC dosage variables did not predict problem behaviors nor did they moderate the association between degree of disability and problem behaviors.

Table 6. *Multiple Regression Analyses Predicting Spring Problem Behaviors, Testing the Moderating Effects of Dosage*

	Model 1			Model 2		
	B	*SE β*	*β*	*B*	*SE β*	*β*
Gender (1=Boys, 0=Girls)	-.07	.10	-.09	-.09	.10	-.11
Age (months)	-.01	.00	-.18	-.01	.00	-.15
Problem Behaviors (Winter)	.82	.13	.83***	.83	.12	.84***
Degree of disability	.00	.00	-.11	.00	.00	-.08
Proportion of days absent	-.43	.93	-.06			
Time with lead teacher (months)				.00	.00	.03
Degree of disability * Proportion of days absent	.03	.04	.10			
Degree of disability * Time with lead teacher (months)				.00	.00	.12
R^2		.67			.68	
F for change in R^2		10.97***			11.36***	

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

Discussion

In this study, we aimed to investigate the extent to which social skills and behavior problems of young children with disabilities were predicted by children's degree of disability and whether that association was moderated by teacher-child interactions or ECEC dosage. Our initial hypotheses were partially confirmed as both the global score of teacher child interactions and teacher scores on emotional support (but not classroom organization or instructional support) moderated the association between children's degree of disability and behavior problems, after accounting for children's age, gender, and previous levels of problem behaviors.

However, these moderation effects were not in the expected direction. While we expected a compensatory effect through which children with more severe disabilities benefited the most from higher-quality teacher-child interactions, unexpectedly, findings suggest lower quality teacher child interactions, and specifically, lower quality emotional support, seem to be associated with increases in problem behaviors for children with less severe disabilities and decreases in problem behaviors for children with more severe disabilities. That lower quality teacher-child interactions is associated with increases in problem behaviors for children with less severe disabilities seems logical and is consistent with previous literature focusing on the associations between

ECEC process quality and children's behavioral outcomes (e.g., Burchinal et al., 2010; Buyse et al., 2008; Johnson et al., 2013; Vandell et al., 2010).

However, the fact that low quality teacher-child interactions are associated with decreases in problem behaviors for the most vulnerable children, that is, those with the most severe disabilities, warrants careful consideration and discussion. We argue that in classrooms with low-quality teacher-child interactions and, specifically, emotional support, children with more severe disabilities engage less in interactions and activities, which translates into parallel decreases in problem behaviors. This hypothesis seems to be plausible in the context of previous research findings on the associations between classroom quality and children's engagement (e.g., Ponitz, Rimm-Kaufman, Grimm, & Curby, 2009) but warrants further examination.

Teacher-child interactions did not moderate the associations between children's degree of disability and social skills. It is possible that the mean quality levels observed for teacher-child interactions are insufficient to influence the social skills of children with diverse degrees of disability, despite the fact that about 50% of our classrooms had emotional support scores above 5 (Burchinal et al., 2010). As previous research on the associations between teacher-child interactions and social competence of children without disabilities has found mostly small effects (e.g., Mashburn et al., 2008), it is likely that children with disabilities are a special group requiring even higher quality, and possibly individualized and intensive interventions, for gains in social skills to be predicted or moderated by classroom process quality.

Similarly to Xue et al. (2016), we did not find evidence of dosage effects on children's social and behavioral outcomes. Our hypotheses on the moderator role of ECEC dosage were not confirmed, when considering either children's absence/attendance or their cumulative participation. It is likely that dosage alone is not sufficient to impact the socio-behavioral outcomes of children with disabilities and that the levels of quality children are exposed to need to be considered. Therefore, future research should investigate the interactions between process quality and dosage (see Zaslow et al., 2010).

Based on zero-order correlation coefficients, we found children with more severe disabilities seem to attend classrooms with higher quality teacher-child interactions, namely, emotional support and classroom organization. This finding

contradicts results reported by Hestenes et al. (2008), who did not find associations between children's degree of disability and classroom global quality and teacher-child interactions. However, it can be linked to previous studies reporting higher levels of global classroom quality in inclusive classrooms (e.g., Grisham-Brown et al., 2010; Jeon et al., 2010). It is possible that child placement decisions are based on teachers' characteristics, with children with more severe disabilities placed in classrooms lead by teachers with higher-quality interactions; it is also possible that teachers adjust their interactions in order to respond to the needs of the children in their classroom. Interestingly, children with more severe disabilities seem to spend fewer months with the lead teacher in the classroom while the number of months with the lead teacher seems to be negatively associated with classroom organization. These associations merit further examination in future research as they may reflect the need to support teachers serving children with more severe disabilities over time.

Limitations

The small number of participants is an important limitation in this study, with implications regarding statistical power and the number of predictors included in each analyses. Major studies on the effects of teacher-child interactions on social-behavioral outcomes have relied on large samples, but have focused on children without disabilities (e.g., Mashburn et al., 2008). Future research on the variables influencing the social-behavioral development of preschoolers with disabilities should recruit a considerable number of children and classrooms in order to consider different disability profiles, test quality * dosage interactions, and control for family characteristics, time spent outside the classroom for pull-out service, social and behavioral supports within early childhood intervention/early childhood special education services, etc.

A second limitation is related to our measure of children's disabilities. Due to sample size constraints, we chose to use children's degree of disability, based on a global measure of functional (dis)abilities (Simeonsson & Bailey, 1991/2005) used in previous studies (e.g., Aguiar et al., 2010; Meyer & Ostrosky, 2016). However, a composite score of disability severity does not provide information on children's disability profile, that is, on the functional and developmental characteristics of participating children. Future research on this topic should examine the role of teacher-child interactions and ECEC dosage on changes in children's social and behavioral development over time as a function of different disability profiles.

Conclusion and implications

Overall, our findings suggest teacher-child interactions, and specifically, teachers emotional support, moderate the association between children's degree of disability and changes in problem behaviors. Particularly clear is the fact that low-quality teacher-child interactions seem to negatively impact the behavioral outcomes of children with milder disabilities. Findings thus suggest the need for professional development efforts focusing on the emotional support provided by ECEC teachers, particularly when a child with disabilities is included in their classrooms. It also suggests early childhood intervention/early childhood special education professionals aiming to support the behavioral outcomes of young children with disabilities might need to consider consultation practices with ECEC teachers focusing on classroom-level interactions.

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CHAPTER V
General Discussion

Social relationships and socio-emotional development of children with disabilities have been considered crucial for early childhood inclusion (DEC/ NAEYC, 2009). In Portugal, almost every child with disabilities is included in regular schools (Direção-Geral de Estatísticas da Educação e Ciência, 2016); consequently, ensuring high-quality interactions likely to promote children's socio-emotional development is an important challenge. Early childhood education and care (ECEC) encompasses settings where children with and without disabilities are engaged and development occurs through proximal processes with peers, teachers, and activities (Vandell & Wolfe, 2000). Previous research suggested children with disabilities have more positive experiences in early childhood inclusive settings (e.g., Buysse, Goldman, & Skinner, 2002; Grisham-Brown, Cox, Gravil, & Missal, 2010; Jeon et al., 2010); however, children with disabilities seem to experience considerable levels of social rejection and exclusion (e.g., Odom et al., 2006).

The main goals of this dissertation were to describe the social relationships and acceptance of children with disabilities, at a dyadic and group level, identifying children with increased risk of social rejection as well as identifying contextual features that enhance or hinder children's social inclusion. The first study aimed to understand how different disability profiles, based on sensorial skills, body and health, verbal and nonverbal competence, social skills and behaviors, were associated with children's friendships, social acceptance, and social networks. A second specific goal was to identify teachers' awareness of processes of social rejection of children with disabilities, which can prevent their social inclusion. The impact of teacher-child interactions, of the amount of time (ECEC dosage) that children with disabilities attend inclusive classrooms throughout the school year, and of the amount of time they have spent with the lead teacher on their friendships and social acceptance was investigated in second study, based on propositions by Bronfenbrenner and Morris (2006). The moderating effects of dosage on the association between children's skills and their friendships and social acceptance was also examined. Finally, the third study analyzed the moderating effects of teacher-child interactions on the associations between children's degree of disability and their social skills and problem behaviors, which are important individual characteristics with the potential to facilitate or hinder their social inclusion.

Disability profiles and children's social experiences

The results of the first study show children with disabilities struggle with social relationships and peer group inclusion, establishing few reciprocal friendships, experiencing low levels of peer social acceptance, and engaging in small social networks. Our hypotheses regarding the associations between children's disability profiles and their social experiences (specifically, their number or reciprocal friends) were only partially confirmed (see Figure 1). Children with severe disabilities across domains and children with socio-behavioral disabilities had fewer friends than children with mild disabilities, while children with physical disabilities did not differ significantly from children with mild disabilities. These findings suggest children with fewer competences across domains, along with children with socio-behavioral disabilities have increased difficulties in establishing social relationships. A moderating effect of gender was found, although not in expected direction: in this study girls with physical disabilities seemed to have fewer friends than boys. Future research on the differential impact of body image for boys and girls with disabilities may, therefore, be warranted.

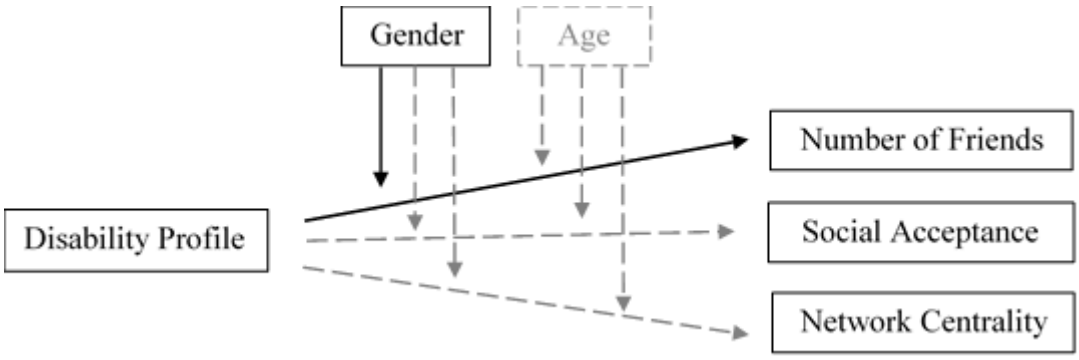

Figure 1. Summary of statistically significant findings of the first study. Non-significant findings are presented in grey.

In inclusive preschools, classroom teachers have the opportunity to intentionally promote and support the relationships of children with and without disabilities (Buysse, Goldman, & Skinner, 2003; Hollingsworth & Buysse, 2009). Findings from the first study raise concerns about teachers' awareness of children social status among their peers. Teachers classified children with disabilities in more positive social statuses, when compared to classifications based on peer sociometric nominations. Teachers'

awareness of children's social relationships and peer acceptance is crucial in identifying children with more difficulties, that need to be intentionally supported in order to improve their social inclusion. If, as suggested by our findings, teachers struggle with the task of identifying children's social status in the peer group, it could jeopardize the attainment of expected social outcomes from early childhood inclusion.

ECEC Dosage and children's social experiences

Bronfenbrenner and Evans (2000) highlighted the importance of exposure to effective interactions to improve development. Despite the fact that previous findings on the impact of dosage were not consistent, especially for children's social development, previous evidence suggested children at high risk, when exposed to high-quality interactions for more time, improve their outcomes (Zaslow et al., 2010). Previous findings also suggested a positive effect of teacher-child interactions on young children's indicators of social acceptance (e.g., Mikami, Griggs, Reuland, & Gregory, 2012). Thus, the second study examined the associations among teacher-child interactions, the skills of children with disabilities, and their friendships and social acceptance, while testing the moderating effects of ECEC dosage. Our initial hypothesis was not confirmed. Contrary to our expectations, teacher-child interactions did not predict children's social acceptance and friendship and this association was not moderated by dosage. As previous research suggests high-quality teacher-child interactions is needed to impact children's relationships and social acceptance, our results may suggest the observed quality of teacher-child interactions did not reach sufficient levels (Burchinal, Vandergrift, Pianta, & Mashburn, 2010).

The second hypothesis of the second study was only partially confirmed. Social acceptance varied as function of specific interaction effects between externalizing behaviors and proportion of days absent as well as interaction effects between verbal competence and proportion of days absent. Children with a lower proportion of days absent and with more externalizing behaviors or less verbal competence had an increased risk of being socially rejected. These findings were surprising. On the basis of the assumptions of the bioecological model of human development (Bronfenbrenner & Evans, 2000), we expected that more days of attendance resulted in increased social acceptance of children with disabilities. This finding suggests placement in inclusive settings is not enough to ensure children social inclusion and targeted interventions are

likely needed to support the peer social acceptance of children with more challenging behaviors and decreased verbal competence (see Figure 2).

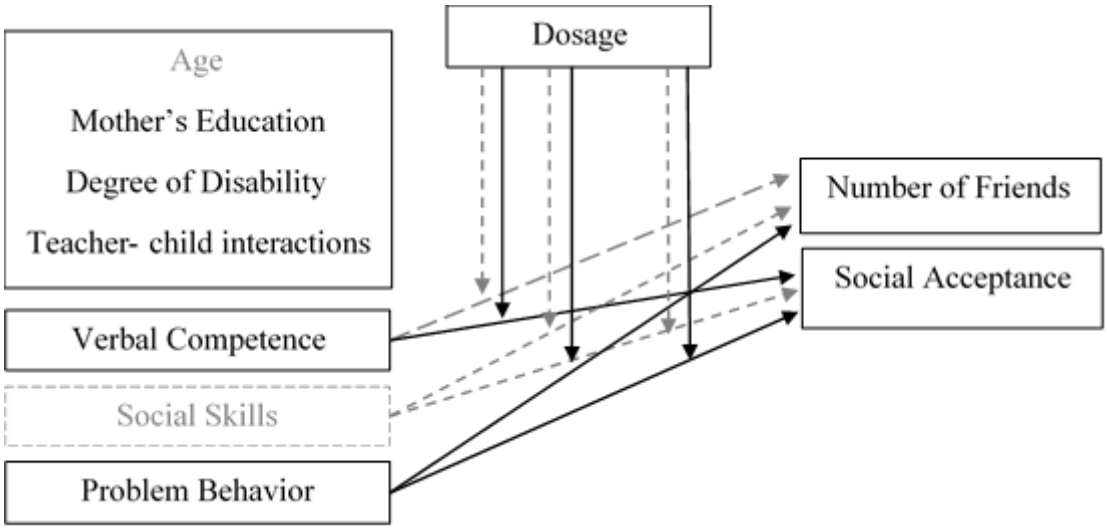

Figure 2. Summary of statistically significant findings of the second study. Non-significant findings are presented in grey.

Friendships of children with disabilities also varied as function of interaction effects between children's externalizing behaviors and the number of months with the lead teacher. Children with high levels of externalizing behaviors have fewer friends, when they spent more months with the lead teacher. This finding was unexpected as we initially assumed teachers who spend more time with a specific child are likely more knowledgeable of his/her needs and difficulties, and have more opportunities to identify effective strategies to manage their behavioral problems in order to improve their social inclusion. Our finding, however, may suggest that, as time passes, teachers likely need more support to promote the social relationships of children with externalizing behavior problems. Throughout this work, behavioral problems, and specifically externalizing behaviors, seem to play a central role in children's social inclusion, which is congruent with previous research (see Meyer & Ostrosky, 2016; Odom et al., 2006).

In the third study, we also examined the moderating effects of ECEC dosage on the association between children's degree of disability and their social skills and problem behaviors. However, ECEC dosage did not predict or moderate the problem behaviors of children with different degrees of disability.

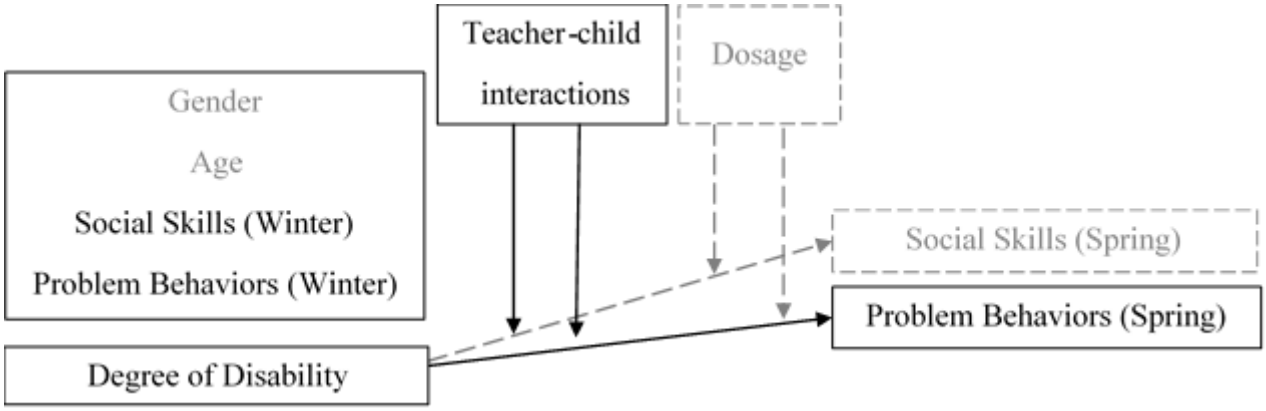

Figure 3. Summary of statistically significant findings of the third study. Non-significant findings are presented in grey.

Teacher-child interactions

Contrary to our hypotheses, the third study did not find associations between teacher-child interactions and children's social skills and moderating effects of ECEC dosage were also not found. We also hypothesized children with more severe disabilities attending classrooms with higher-quality teacher-child interactions (i.e., emotional support, classroom organization, and instructional support) would have greater improvements in problem behaviors. In fact, we found an interaction effect between teacher-child interactions and, specifically, emotional support and children's degree of disability. However, we found children with less severe disabilities had more problem behaviors in classrooms with lower-quality teacher-child interactions, while the inverse happened with children with more severe disabilities. Findings for children with milder disabilities are consistent with previous studies reporting positive associations between teacher-child interactions, specifically the emotional support domain, and the improvement of problem behaviors of children without disabilities (Burchinal et al., 2010; Mashburn et al., 2008). Findings for children with more severe disabilities may suggest that, when enrolled in lower-quality classrooms, these children are more passive and less engaged in activities, displaying low levels of problem behaviors. However, further research is needed to test this hypothesis.

Limitations

Several limitations should be considered when discussing our findings. First, the number of participants was small, particularly for the third study, and children presented a wide variability regarding type of disability. This fact limited our analyses in terms of

number of predictors and interaction effects included in our models. Related to this, in the second and third studies, a larger number of participants would allow us to consider children's disabilities profile as predictor and/or moderator, providing more information on the impact of children's characteristics on their social experiences. Also in the first and second studies, the sociometric task was not completed by children with lower-levels of functioning, which resulted in missing data for these children. Therefore, this work does not add to the knowledge about the friendships of this specific group of children, who are probably at higher risk of social exclusion. Another limitation is associated with the fact that only children with parental consent participated in sociometric task, resulting in incomplete data on participating classrooms' social structure. It is possible that relationships with peers that did not participate in our study exist and were not accounted for. Future research should account for these gaps at the level of the research design and methods used.

Another limitation is associated with the amount of time that some children with disabilities spend outside the regular classroom, when receiving pull-out early childhood special education or early childhood intervention services. This amount of time (i.e., frequency and duration) was not accounted for nor controlled in the three studies. Pull-out interventions have been related to poorer language and less social skills (Son et al., 2014), which may have a negative effect on children social relationships. Furthermore, friends often play together (Goldman, 2007) and children's time outside the classroom may decrease their engagement in play activities and interactions with peers. Time spent in pull-out services may also influence teachers' awareness of children social status in the peer group.

Parents have an important role in promoting and supporting children relationships (Buysse et al., 2003) and probably have important information on their social experiences. Preschool settings are not the only place where children can have friends and parents may know about other relationships in other contexts of life, that contribute to the social inclusion of children with disabilities. In our studies, only children and teachers contributed with data on the social experiences of children with disabilities, which may be considered an important limitation.

Teachers were important informants on several measures, including children's (dis)abilities, social skills, and problem behaviors. Independent assessments of

children's characteristics, including observational measures, would benefit our work and should be considered in future research.

Implications for practice

Findings from this work highlight the importance of ensuring Portuguese ECEC teachers' professional development in order to enhance their competence in identifying and supporting the relationships and peer group experiences of children with disabilities. Enhancing the quality of teacher-child interactions should also be an important goal of professional development activities, particularly for teachers of children with externalizing behaviors that have higher ECEC dosage.

It is important to support teachers in developing skills to actively and intentionally support children's friendships, identifying signs of the presence/absence of this type of relationship and creating opportunities for children with disabilities to positively interact with peers (Hollingsworth & Buysse, 2009). Children with disabilities may have more difficulties in having friends, particularly as a result of their problem behaviors (see Meyer & Ostrosky, 2016; Odom et al., 2006), which we have identified as a factor likely to increase the risk of social rejection and exclusion. Recently, a Policy Statement on Inclusion of Children with Disabilities in Early Childhood Programs (U.S. Health and Human Services & U.S. Department of Education, 2016) recognized the importance of removing barriers related to challenging behaviors that hinder the social inclusion of children with disabilities, through teachers' professional development. Implementing classroom programs such as the Pyramid Model, with different levels of intervention – from the development of a healthy social-emotional context where teachers and peers establish strong and positive relationships, to tailored intensive and individualized interventions (Fox, Dunlap, Hemmeter, Strain, 2003) – may be very important in enhancing children's social inclusion. Further, early childhood intervention or early childhood special education professionals may serve as consultants for lead ECEC teachers, supporting them in improving the social and behavioral development of children with disabilities and, consequently, their social relationships.

Our findings further suggest the mere placement of children with disabilities in inclusive classrooms is not enough to promote their social inclusion. Our results suggest the possible negative impact of ECEC dosage on children social relationships: both children with more problem behaviors and children with less verbal competence with

higher attendance seem to need intensive and individualized interventions in order to improve their involvement in positive relationships with peers. Further, lead teachers who spend more time with children presenting externalizing behaviors also need more intensive support to improve children social outcomes.

High-quality teacher-child interactions and, specifically, high levels of emotional support, may help prevent challenging behaviors of children with milder disabilities. Therefore, teachers should be supported in creating emotional connections with children, based on physical proximity and affection, positive and respectful communication. Teachers should be supported in becoming aware of and responsive to children who need an extra support, anticipating problem behaviors, providing comfort, reassurance and acceptance, addressing children's problems and concerns. Finally, teachers should be supported in being flexible with their plans or agenda, searching for meaningful opportunities to involve children in activities, respecting children interests, supporting their autonomy and independence during activities, and providing opportunities for children to talk and express their ideas (Pianta, La Paro, & Hamre, 2008).

Directions for future research

Future research should consider parental reports on the social status of children with disabilities. Parents have valuable information on the social experiences of children both in ECEC and in others contexts of life. Comparing parents', teachers', and children's perspectives may provide a deeper and broader understanding of children's social experiences. Another interesting path for future research derives from our findings on the moderator role of children's gender, in the case of children with physical disabilities. The potential differential impact of physical disabilities on young boys and girls, as well as its developmental course over time, merits further investigation.

Three other research directions should be considered: (1) longitudinal studies should be conducted to provide a developmental perspective of the social experiences of children with disabilities over time; (2) intervention studies should be conducted, aiming to identify effective classroom interventions as well as professional development programs for teachers targeting the social outcomes of children with disabilities; finally, (3) studies focusing on the role of early childhood special education and/or early childhood intervention professionals in supporting ECEC teachers in their efforts to support children's social inclusion should be considered. Naturally, building on the

limitations of our work, future research on the social experiences of children with disabilities should also include a higher number of participants.

Conclusion

The three studies presented here contribute to our knowledge on the social experiences of Portuguese children with disabilities, identifying factors that hinder social inclusion and should, therefore, be targeted by practitioners and policymakers. Taken together, our findings highlight the potential negative impact of ECEC dosage for children with more challenging behavior and decreased verbal competence while also suggesting the importance of enhancing the quality of teacher-child interactions in inclusive preschool settings to positively impact children's social development, especially for children with problem behaviors.

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