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The impact of playgroups for children and families: the role of dosage, quality and long-term effects

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*Às minhas avós, Idalina e Guiomar,
tantas saudades de brincar convosco*

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Resumo

Os *playgroups* são encontros para as crianças pequenas e os seus cuidadores interagirem e brincarem. A evidência mostra que os *playgroups* têm efeitos sociais e cognitivos para os participantes. Porém, a fraca qualidade dos estudos anteriores limita a validade interna e externa dos efeitos e, até agora, nenhum examinou os efeitos de longo prazo dos *playgroups*. O objetivo desta tese foi estender o ensaio experimental do programa de *playgroups* em Portugal, testando os efeitos da dosagem e da qualidade no ambiente familiar e nas práticas de cuidado, e no desenvolvimento cognitivo, temperamento e comportamento das crianças. Também visamos monitorizar os impactos a longo prazo dos *playgroups* nas mesmas variáveis. Conduzimos três estudos: primeiro, testamos a associação experimental entre a dosagem do *playgroup* e os efeitos para as famílias e crianças usando a Análise de Subgrupos Endógenos Previstos Simetricamente; segundo, desenvolvemos e validamos a primeira medida de qualidade dos *playgroups*, a *Playgroup Environment Rating Scale*; terceiro, examinamos os efeitos a longo prazo dos *playgroups*. Os resultados sugeriram que uma maior qualidade de aprendizagem pela brincadeira está positivamente associada a níveis mais altos de linguagem infantil. Descobrimos que os *playgroups* são benéficos para as crianças e que os seus efeitos ainda são significativos a longo prazo. Os impactos são principalmente na linguagem das crianças, naquelas que têm uma dosagem superior. As crianças de meios desfavorecidos, apesar de frequentarem menos do que as mais privilegiadas, foram as que mais beneficiaram. Esta investigação forneceu contribuições teóricas e metodológicas e informou políticas públicas e práticas.

Palavras chave: playgroups, dosagem, qualidade.

PsycINFO Codes:

2260 Métodos de Pesquisa & Desenho Experimental

2956 Educação infantil & Cuidados Infantis

3373 Comunidade & Serviços Sociais

Abstract

Playgroups are gatherings for young children and their caregivers to engage in social and play-based activities. Evidence shows that playgroups promote social and cognitive outcomes for families and children. However, weaknesses in the design of previous research limit the internal and external validity of findings and, to date, no studies have been conducted examining long-term effects of playgroups. The aim of this thesis was to extend the experimental trial of an innovative playgroup program in Portugal by testing the effects of dosage and quality on home environment and caregiving practices, and on children's cognitive development, temperament and behavior. We also aimed to monitor long-term impacts of playgroups on these outcomes. We conducted three studies: first, we tested the experimental association between playgroup dosage and the outcomes for families and children using the Analysis of Symmetrically Predicted Endogenous Subgroups; second, we developed and validated the first-ever measure of playgroup quality, the Playgroup Environment Rating Scale; third, we examined the long-term effects of playgroups on outcomes. Findings suggested that higher play-based quality was positively associated with higher levels of children's language. We also found that playgroups are beneficial for children, and that their effects are still significant in the long term. The impacts are primarily on children's language, especially for those who have a higher dosage of playgroups attendance. Finally, children from disadvantaged backgrounds, despite attending playgroups less often than more privileged ones, benefitted the most. This research provided theoretical and methodological contributions and informed public policies and practices.

Keywords: playgroups, dosage, quality.

PsycINFO Codes:

2260 Research Methods & Experimental Design

2956 Childrearing & Child Care

3373 Community & Social Services

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CHAPTER 1

Introduction

The first few years after birth play a vital role in establishing fundamental neural pathways that enable the acquisition of important linguistic, cognitive, emotional and social abilities later in life, that are essential to succeed throughout childhood and adulthood (Brito et al., 2022; OECD, 2018; Schleicher, 2019). The importance of providing high-quality care and stimulation to children from birth is well recognized, and there is strong evidence that children's future skills development and learning are strongly influenced by their first years of life (Humphreys et al., 2015; Barros et al., 2016; OECD, 2018; Shonkoff & Phillips, 2000). It has also been recognized that disparities in cognitive, social, behavioral, and health status between children from lower- and higher income families appear as early as 9 months of age (Halle et al., 2009). In these first years of life, high-quality early childhood education and care (ECEC) might reduce the negative impact of poverty, low maternal education, and other risk factors associated with negative child outcomes (e.g., Barros et al., 2016; Duncan et al., 1994; Huston et al., 1994; Love et al., 2005; National Institute on Child Health and Human Development [NICHD] Early Childhood Research Network, 2005; Melhuish et al., 2015).

Prior to the late 1990s, the Portuguese government experienced a significant increase in education investments. Following this period, investments remained relatively stable, with some fluctuations throughout the years (Instituto Nacional de Estatística [INE], 2021). ECEC in Portugal serves children up to 6 years old and comprises both semi-public and private sector settings, including private for-profit and private non-profit establishments (Eurydice, 2019). As in most European Union countries, enrolment in ECEC in Portugal has been increasing over the past decade (OECD, 2019). Nearly 20% of children under the age of one-year old are enrolled in ECEC, the fourth highest rate among OECD countries and more than twice the OECD average of 9%. The enrolment rate increases to 40% among one-year old's (OECD average: 40%) and to 52% among two-year old's (OECD average: 62%) (OECD, 2019).

Although attending ECEC is not mandatory, access has very recently been guaranteed, for free, for all children born from September 1st, 2021, onwards (Normative Dispatch no.14837-E/2022). To combat child poverty, promote integration and equal access to opportunities, and support families in balancing personal, family, and professional life are the main objectives of this law (Law no. 2/2022). The law has already extended the benefit to licensed for-profit private childcare centers. The process will be phased in gradually until 2024. By the end of the

implementation of the measure, the goal is to have approximately one hundred thousand children already integrated. However, in 2017, the year during which our original study took place, 12% of children up to three-years-old do not attended formal public or private ECEC (OECD, 2023).

ECEC services for children under age 3 are more likely to be used by families in which the mother works. In Portugal, employment rates of mothers with children up to 3 years-old is nearly 80% (OECD, 2022), stable since 2017, and mothers with a tertiary education are more often employed than those with a lower education. The impact of a ECEC service on a child's development is the highest for children from families with lower levels of education (Ladd, 2017). The extension of ECEC services to these families would improve their children's prospects and facilitate the participation of mothers in the labor force.

Besides ECEC formal services, families have two options for the education and care for their children: family care and informal care. For most of the children, a home environment that is safe, stimulating, positive and protecting sets them on a good developmental pathway (Walker et al., 2011). However, in many families, children do not have sufficient support for early learning, or are exposed to many developmental risks. In 2020, 21,6% of Portuguese children were at risk of poverty and/or suffering from severe material deprivation and/or living in households with very low work intensity (INE, 2021). This number was even higher in 2016 (27%). Due to such unstable situation, some families may face challenges providing such an environment, thus missing the opportunity for their children to reach their fullest potential.

Informal care programs have been emerging as a response to the formal ECEC service gap, especially for families from a socioeconomically disadvantaged background. Playgroups is one model of informal care that has been being established in several countries (e.g., Australia, Italy, German, United Kingdom, Hong-Kong, China) and is very important in the family support gap between maternity services and children's ECEC or school entry (McLean et al., 2022).

In the international literature, there is a consistent portrayal of playgroups as customary and casual gatherings where caregivers¹ and their young children come together to allow the children to interact and play with one another. The key difference between a playgroup and other forms of early education or care, such as creche, childcare, preschool, or kindergarten, is that caregivers remain present during the session, engaging with their own children and

¹ The word "caregiver" is used across this work to signify any important adult caregiver including parent, guardian, carer, family and/or kinship member, or any other significant adult in the lives of children.

promoting play, while also socializing with other adults (caregivers and facilitators) (Dadich & Spooner, 2008; Hancock et al., 2015). Playgroups are distinguished by the participation of caregivers in guiding and promoting children's play. This emphasis on caregiver involvement underscores the potential of playgroups to support children's development and learning, as well as support caregivers in their parenting role (Njegac et al., 2016).

This thesis employs the term *playgroup* to refer to an informal gathering of caregivers and children but is important to note that playgroup systems and usage patterns differ across different countries. In Australia, for example, children commonly attend playgroup before the age of four and then proceed to a more structured preschool or kindergarten program before beginning school (Oke et al., 2007, Sincovich et al., 2020). Conversely, in the United Kingdom, children from low socioeconomic backgrounds are more likely to attend nursery, a less formal type of preschool that offers a range of programs for children from infancy to school age, while playgroup is generally used by a smaller proportion of children from higher socioeconomic backgrounds, or as a complement of formal ECEC (Daniels, 1995; Sincovich et al., 2020). In both countries there are local and national playgroup associations (e.g., Playgroup Associations of Australia; Preschool Playgroup Association in the UK) with professional coordinators, and with established procedures for organizing and running a group.

The ways in which playgroups are implemented - in terms of their funding sources, who initiates or creates new playgroups, and how sessions are conducted – also differ significantly within and across countries (Sincovich et al., 2020). Variations include designations such as parent-baby-and-toddler groups in the United Kingdom, parent groups in Canada, community playgroups, which are volunteer-led and open to all families, and supported playgroups, which are facilitated by paid personnel and aid families with specific vulnerabilities in Australia (Commerford & Robinson, 2016; McLean et al., 2022). This thesis focuses on supported playgroups.

This supported playgroup model is generally recognized as an effective way to connect families living in disadvantaged communities because it offers an informal, non-threatening service that facilitates easy access to more formal types of support (Department of Families, Housing & Community Services and Indigenous Affairs [FaHCSIA], 2011). Research evidence about supported playgroups benefits provide indication that such service has the potential to improve a range of outcomes for children, such child language, cognition, and behavioral skills (Deutscher et al., 2006), and for caregivers, namely in increasing parental competencies in stimulating children's development and learning (Hackworth et al., 2013) and access to health and education services (Commerford & Robinson, 2016). However, weaknesses in the design

of these studies limit the internal and external validity of findings and, to date, no studies have been conducted to ascertain whether these impacts are felt in the long term. Moreover, only one non-experimental study from Australia linked benefits for families with levels of attendance, suggesting a dosage effect, through which higher attendance is associated with greater impacts (Berthelsen et al., 2012).

The Portuguese pilot project Playgroups for Inclusion or *Grupos Aprender, Brincar, Crescer*² (Barata et al., 2017; Freitas-Luís et al., 2017) was the first randomized controlled trial (RCT) of a playgroup intervention. Little is known about what happens during playgroups to facilitate change (Williams et al., 2015). Specific factors (e.g., a stimulating program content) have been associated with engagement of families in playgroups (Williams et al., 2015). Such factors are important when evaluating quality of playgroups.

Quality is considered a dynamic and a transitory concept (Moss & Pence, 1994). The OECD has taken a two-tier approach – structural and process – to defining quality to proceed policy discussions and sets out child development as quality targets (Taguma et al., 2012). Until 2022, there was no adequate and flexible measure of playgroup quality. However, evidence shows higher levels of quality in day care centers associated with children’s development (Pessanha et al., 2009; Bryant et al., 2003).

Because ECEC policies have the highest return on investment of all educational policies (Cunha et al., 2005) it is essential to open the “black box” of playgroups implementation mechanisms that are important in practice and the true impact of these interventions in the long term. By using an experimental design, the data from the Playgroups for Inclusion project is an opportunity to shed light on these open questions.

Thus, the main objectives of this thesis are to:

- (a) analyze the role of playgroup dosage on the outcomes for families and children;
- (b) analyze the role of playgroup quality on the outcomes for families and children and
- (c) analyze the long-term impacts of playgroups on families and children.

The timeline of the thesis, that includes the experimental evaluation and implementation phases from the Playgroups for Inclusion project is shown in Figure 1.1.

² The project *Playgroups for Inclusion* was supported by the European Union Programme for Employment and Social Solidarity—PROGRESS (2007-2013) under the call VP/2013/012: Call for Proposals for Social Policy Experimentations Supporting Social Investments (Grant Agreement: VS/2014/0418).

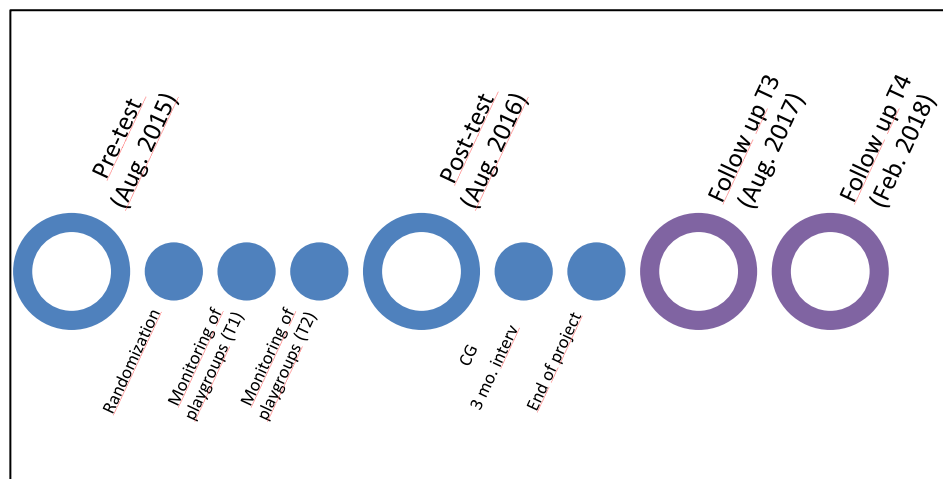


Figure 1.1. Timeline of the thesis.

Outcomes for the evaluation of impact of the Playgroups for Inclusion project were selected according to a carefully designed and frequently reviewed Theory of Change. A Theory of Change is a conceptual tool that allows teams to examine the congruence between the object of study, and the proposed research design, evaluation measures, analysis plan, etc. (Anderson, 2005; Connell & Kubisch, 1998; Weiss, 1995). It is a particularly efficient tool to align expectations of providers and evaluators regarding community interventions (Buitrago, 2015). The Theory of Change allows for theoretical reflection on some mechanisms that can contribute to the effectiveness of projects, such as quality and dosage (Anderson, 2005). The Theory of Change also allows teams of research and implementation to prioritize outcomes, given experiences of program implementation, concerns of limited statistical power, differences in data quality according to data collection experience, and other issues. In the project Playgroups for Inclusion this Theory of Change was initially based on extant literature on playgroups and ECEC services, and then reviewed in accordance with the intentionality discussed by the intervention team in common meetings. In the Playgroups for Inclusion, Theory of Change hypotheses of effect sizes were expressed in the rank order of outcomes, i.e., larger effects were expected for Home environment and Caregiving Practices, Child Cognitive Development, and Child Temperament and Behavior. In its final version (Figure 1.2.), the Theory of Change specified impacts of playgroups on a set of expected main and secondary outcomes at the domain and subdomain level organized by domain importance (Barata et al., 2017).

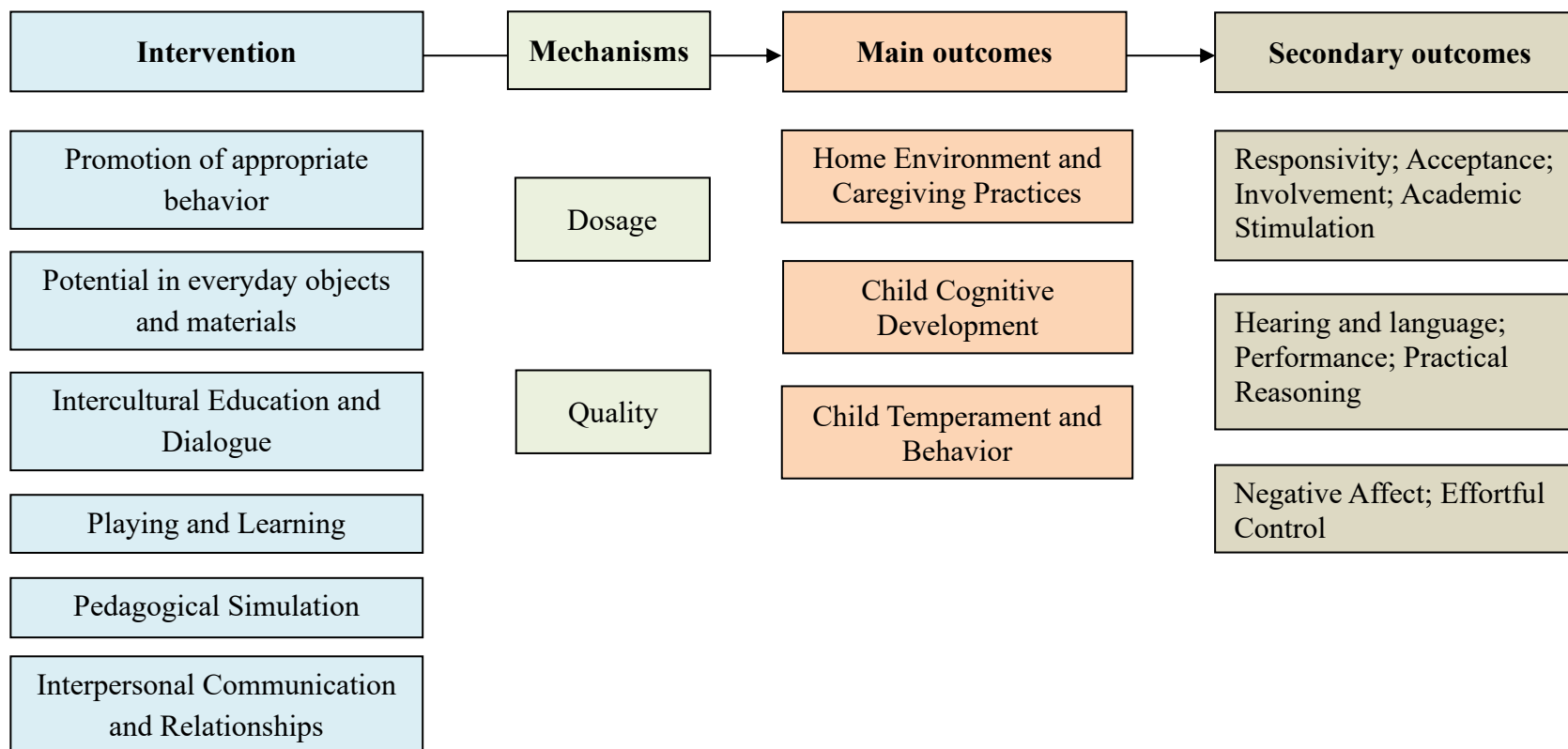


Figure 1.2. Theory of change for Playgroups of Inclusion, focusing on main and secondary outcomes.

Considering the objectives, this thesis is organized in five chapters. In Chapter 1, we present the introduction and theoretical background that guided this thesis. We further explain our conceptual framework and describe the project Playgroups for Inclusion. Finally, we present the relevance and purpose of this thesis.

In Chapter 2, we analyze the impacts of a playgroup intervention for a subset of families and children who were most likely to attend playgroup sessions. Following the Analysis of Symmetrically Predicted Endogenous Subgroups (ASPES), a methodological approach developed by Laura Peck (2013), this chapter provides a new estimate of playgroup impacts, based on those families and children whose profiles predict them to experience a higher-dosage of the playgroup intervention.

In Chapter 3, we describe the development and validation of the Playgroup Environment Rating Scale (PERS), a standardized observation measure designed to assess the quality of playgroups. We describe the quality of playgroups and explore which quality features are more correlated with the outcomes for children. A paper version of this Chapter was published in open source in the *Frontiers of Education* in 2022.

In Chapter 4, we analyze the long-term impacts of a playgroup intervention in children and family outcomes. With this analysis we seek to open discussion to the dynamics of change as children develop and to give policymakers and researchers access to quality data and analysis about playgroups.

Lastly, in Chapter 5, we summarize the main findings. The conclusions integrate the main theoretical and applied contributions of the findings; drawing some conclusions concerning the implication of the findings for playgroup research, practice and policy, raising questions that have yet to be addressed by further research. We also discuss the limitations of this work. Figure 1.3. synthesizes the structure of this dissertation.

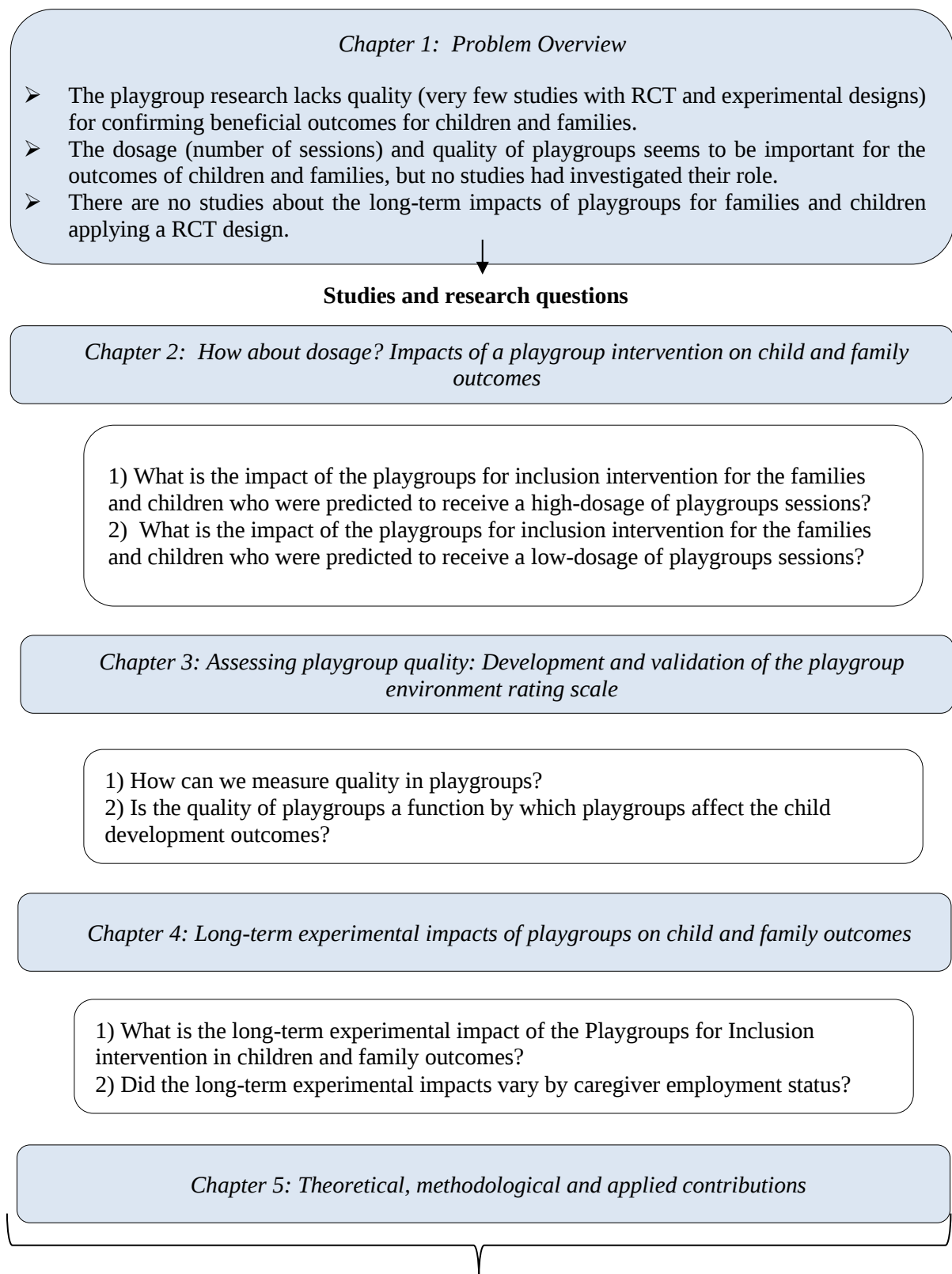


Figure 1.3. Overview of the problem, research questions and chapters.

1.1. What are playgroups?

Playgroups are groups within a community that gather caregivers with young children to engage in social activities and play together. The main purpose of playgroups is to provide an opportunity for young children to interact with peers and develop social skills while their caregivers also get a chance to socialize and connect with others in their community (Commerford & Robinson, 2016; Dadich & Spooner, 2008). They are a unique form of early childhood education and care (ECEC), providing a shared play and learning experience for children and their adult caregivers (McLean et al., 2022).

Playgroups were first formulated in the 1970s in Australia by, and for, mothers (Townley, 2018). The playgroup movement had a tremendous impact, with the participation of thousands of women who relied on it for their daily lives, and that of their young children (Townley, 2018). In its origin, playgroups were organized gatherings of mothers and their babies and preschool-aged children, meeting regularly for a few hours each week to facilitate learning through play (Townley, 2018). Playgroups rapidly evolved to be provided by non-profit organizations. For example, in the UK they were initially volunteer-based but have become more professionalized (Dean, 2005; McLean et al., 2022).

Playgroups meet regularly in school libraries or other school space, libraries, families-house, gardens, for example, and are scheduled at a convenient time for families (Dadich & Spooner, 2008). They follow a flexible routine that promotes healthy habits and aim to help caregivers support their child's development. Group size varies based on children's ages and needs, and families can contribute to planning the structure (Social Entrepreneurs, 2011; Jackson, 2011, 2013). Activities may include indoor or outdoor play, art/crafts, music singing, bridging maternal and formal childcare. Caregivers attend with children and are responsible for them, making it a great place to engage caregivers and promote child health (Trost et al., 2021; Wright et al., 2019).

1.1.1. Types of Playgroups

Playgroups are typically classified into two categories: self-managed, commonly known as *community playgroups*, and *supported playgroups*. It is important to note that all playgroups intent to enhance the growth and development of children and their caregivers by offering play opportunities that are appropriate for their developmental stage. Additionally, all playgroups provide caregivers with chances to establish social and support networks, as well as receive peer support (FaHCSIA, 2011).

Community playgroups are services established and managed by the caregivers who participate in them (FaHCSIA, 2011). These playgroups aim to offer general self-managed peer support, an opportunity for children to interact and learn through play, thereby enhancing their social, emotional, and physical abilities. They are an opportunity for caregivers to build social and support networks and early intervention for children in disadvantaged backgrounds (Commerford & Robinson, 2016; FaHCSIA, 2011). In Australia, there are Playgroup Organizations that help caregivers in initiating new playgroups or locating established playgroups to participate in. Furthermore, they offer universal assistance, including details regarding training and support, insurance, fundraising, events, and guidance on obtaining access to resources and venues (Centre for Community Child Health [CCCH], 2011; Commerford & Robinson, 2016).

Supported playgroups are facilitated by, at least, one paid trained facilitator. The primary objective is to support families with specific needs or vulnerabilities by creating opportunities for caregivers to gather and exchange their experiences, while also enabling children to engage in play, learning and socialization activities (Boddy & Cartmel, 2011; CCCH, 2011; Commerford & Robinson, 2016; Jackson, 2011, 2013). Supported playgroups aim to improve children's development through quality early childhood experiences, educate caregivers on child development and positive guidance, foster social connections, provide resources, and identify and refer developmental issues to appropriate services (Jackson, 2013). Supported playgroups offer inclusive opportunities for families facing social disadvantage, isolation or disability to build their relationship in a supportive environment, develop social and family support networks, and improve their skills and confidence (Wright et al., 2019). Further, they can serve as a platform for implementing programs and interventions (Commerford & Robinson, 2016).

Playgroups may also vary in their target group. In some countries, playgroups are a universal service (Oke et al., 2007), whereas in other countries, they are targeted for the inclusion of culturally and linguistically diverse (CALD) families, including refugees, indigenous, young mothers, families of low socioeconomic status, with substance abuse problems or mental illness, or with children with special needs (ARTD, 2008) who may not access other parent-led playgroups easily.

Playgroups also vary according to their theoretical approach and central purpose. In some countries, such as the UK and Australia, playgroups are generally focused on providing care and socialization opportunities for children under five. In other countries, such as Belgium Flanders, France, Italy, and Japan, similar services are aimed at providing families, particularly

mothers, with (immaterial) support (Hoshi-Watanabe et al., 2015). These are generally labeled “Centers for children and parents” (CCP) and tend to have some financial support (public or private), and a minimum of one person (staff) facilitating the sessions. In some cases, CCPs were inspired by a psychoanalytic approach (e.g., *Maison Verte*, France) and focused on the prevention of social isolation, psychological loneliness, and psychological problems in the mother-child relationship in the early years. Later, CCPs were also targeted at increasing birth rates in some countries (Hoshi-Watanabe et al., 2015).

Playgroups vary in the amount of professional support available to facilitators from no specific training (e.g., *Lieux d'accueil* parents-enfants, France), to paid staff with training in education (e.g., *Ko sodate-shien*, Japan, and *Centri per Bambini e Genitori*, Italy), to volunteers or psychoanalytic therapists (e.g., *Maison Verte*, Belgium). In Italy, the staff is supervised by a pedagogical coordinator who is associated with the other ECEC in the area (Hoshi-Watanabe et al., 2015).

Because playgroups have a longer implementation history and have been more carefully documented than CCPs (there are very few available studies on CCPs, see exception Hoshi-Watanabe et al., 2015), the term playgroups is used to refer to the new program implemented in Portugal. However, it is important to note that Playgroups for Inclusion were inspired by both traditions (Freitas-Luís et al., 2017).

1.2. Theoretical underpinnings

The framework of supported playgroups is grounded in the evidence base from research into the early years of a child’s life (Commerford & Robinson, 2016).

1.2.1. Playgroups framework

Ecological models recognize that an individual’s health and development take place within the interplay of family, education systems, and community environments, which are in turn influenced by larger social, economic, political, and cultural factors. Many researchers utilize this framework, which is based on the work of Bronfenbrenner (Bronfenbrenner, 1979; Bronfenbrenner, 1992) to analyze and understand the complex dynamics of supported playgroups (Jackson, 2009; McLean et al., 2014).

Bronfenbrenner’s ecological model stresses interdependence of development in family, school, and community environments shaped by social, economic, and cultural factors. Modifications in one setting affect others, requiring a holistic approach (Bronfenbrenner, 2005;

McLean et al., 2014; Zubrick et al., 2000). The model emphasizes complex interplay between development and multiple levels of environmental influence (Zubrick et al., 2000; McLean et al., 2014). Furthermore, the bioecological theory highlights the importance of studying the bidirectional nature of the relationship between an individual and their environment; the individual's characteristics, behavior, and development can also shape and influence their surrounding environments.

In sum, Bronfenbrenner's ecological model posits that a child's development is shaped by various interactive microsystems, such as family, community, and educational settings, in which the child participates (Bronfenbrenner, 1979). This ecological theory forms the basis of research that demonstrates how factors like parenting practices, educational quality, and community resources all interact to impact the learning outcomes and developmental trajectories of young children, especially those from diverse socioeconomic backgrounds (Ryan et al., 2006). The family microsystem is identified as the most significant for a young child, with research showing that family has the greatest influence on a child's development, particularly during the early years (Desforges & Abouchaar, 2003).

Researchers on playgroups also refer to Epstein's model of overlapping spheres of influence (Epstein, 1987) to understand playgroups (Njegac et al., 2016). This model also highlights the interconnected influence of family, school, and community on the outcomes of children. The model emphasizes that children's learning and success are enhanced when there is collaboration and complementary support among these three spheres. When families, schools, and communities work together, children's learning and development are more likely to be successful (Njegac et al., 2016). Figure 1.4. shows the playgroup model framework.

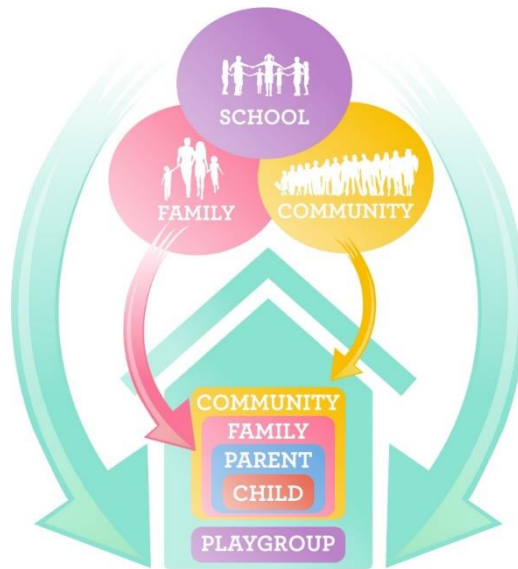


Figure 1.4. Playgroups framework (Njegac et al., 2016). Reproduced with author's permission.

1.2.2. Play and development

To understand the importance of playgroup experience for families, it is essential to understand play and its associated benefits. Play is commonly defined as an activity that is freely chosen, personally directed, intrinsically motivated, spontaneous, and pleasurable (Brockman et al., 2011a, 2011b). Play and playfulness are integral to human culture (Lockwood & O'Connor, 2017) and was described by Vygotsky (1978) as a leading factor of development.

Play is so significant in a child's development that has been recognized by the United Nations High Commission for Human Rights (UNHCHR) as a basic right of every child (Office of UNHCHR, 1989). It is particularly important during the early years of life when brain development and learning speed are at their highest (Frost, 1998; Nijhof et al., 2018). Through play, children have access to unique opportunities for learning and skill acquisition, resulting in significant and meaningful growth (Vale, 2013). Furthermore, play is an effective way to establish positive relationships with caregivers (DeKoven, 2014; Ginsburg, 2007; Runcan et al., 2012). Beyond its role in relationships, play is considered an indicator of quality in formal educational settings (Gleave & Cole-Hamilton, 2012; LEGO Foundation, 2019) and is a crucial component of informal education (Neto, 2003).

However, play is at risk, as children are engaging in less play than those of previous generations (Ginsburg, 2007; Yogman et al., 2018). For example, in Portugal, the study "*Portugal a Brincar II – 2022*" (Estrelas & Ouriços, 2022) with 1600 children up to 10 years old concluded that children do not play enough, verifying a decrease in playtime from 2018

until 2022 (five hours of play in 2018 and one or two hours in 2022). Globally, factors such as demographic changes in family structures (i.e., fewer siblings to play with at home), focus on outcomes (i.e., literacy and numeracy skills), an increase in passive entertainment such as television, smartphone and video games, and excessive safety concerns are some of the causes that limit children's play opportunities (Coelho & Vale, 2017; Ginsburg, 2007; Lester & Russell, 2010; Whitebread et al. 2012).

It is important to note that the COVID-19 pandemic also had a negative impact on children's play, not only regarding the time children spent playing but also in terms of the qualitative characteristics of play; for example, children chose more videogames, television, PC, tablet, or smartphone than playing with board games (Korti et al., 2021). In the study "*Portugal a Brincar II – 2022*" (Estrelas & Ouriços, 2022) 67.5% of respondents considered that the pandemic had a negative impact on play, due to "limitations on the use of outdoor play spaces" and playmates, as well as "decreased willingness of the child to play" and "increased use of technology".

Playgroups offer opportunities for observation, modeling of play activities, conversation, and use of appropriate toys and spaces (Njegac et al., 2016). It also provides an opportunity to influence parent's knowledge of the importance of learning through play. By creating appropriate scaffolding, adults can challenge, support, and extend children's play experiences to maximize their learning potential. Through play, children have opportunities to experience and process information about themselves and their environment (Sims, 2013).

1.2.3. The group as social support

Research in the social sciences recognizes the importance of social support for both children and families (Hanna et al., 2002; Jackson, 2011). Social support can be understood at both a structural and functional level. At a structural level, social support refers to an individual's social network, which can be either formal, such as professionals, or informal, such as family. At a functional level, social support can take different forms, including informational, instrumental, emotional, and appraisal support (Leahy-Warren, 2005). These types of support are interdependent and interconnected, highlighting the importance of social support for individuals and families (Commerford & Robinson, 2017).

Playgroups prioritize socialization and interaction for individual learning and well-being. They promote relational and interactional dimensions during sessions, encouraging dialogue, play, and active participation to foster growth and development for both children and adults (Commerford & Robinson, 2017). Caregivers can observe their child's play and learn how to

extend their learning, reducing stress through a supportive community (Commerford & Robinson, 2017). Playgroups offer opportunities to use everyday activities for valuable learning experiences (Freitas-Luís et al., 2017; Sims, 2013). A safe and inclusive space with child-safe practices and convenient locations is very important for families. In line with social support theory, supported playgroups go a step further, offering caregivers access to peer support that promotes not only feelings of wellbeing, identity and self-care, but also belonging, friendship, and connectedness (Commerford & Robinson, 2017).

Studies show that informal and voluntary relationships are preferred over professional ones, which aligns with the nature of supported playgroups (Commerford & Hunter, 2017; Njegac et al., 2016; Wright et al., 2019). Playgroups promote social connections between caregivers, families, and the local community, while nurturing parental attachment and social development in children. They create peer support networks, connect families to community resources, and offer intentional opportunities for families with support needs (Commerford & Hunter, 2017; Njegac et al., 2016).

1.3. Benefits of playgroups

Despite the growing interest in playgroups as an accessible form of ECEC, and the widespread use of supported playgroups as an approach to promoting early childhood development and supporting families, the existing literature is limited. Firstly, research has been centered on Western-Culture countries, namely Canada, Italy, France, the United Kingdom, and Australia (McLean et al., 2022). Furthermore, most research on playgroups adopts a qualitative or mixed-methods design, utilizing interviews and/or non-validated measures with caregivers, playgroup facilitators, and stakeholders (McLean et al., 2022; Williams et al., 2020). However, there is indication that playgroups bring outcomes for the children and the caregivers/families who participate.

1.3.1. Beneficial outcomes for children

Studies assessing the outcomes for children are limited and usually rely on caregiver and facilitator reports. However, these limited findings suggest that playgroups generate positive benefits for children. In Florida, on a quasi-experimental study by Fabrizi and Hubbell (2017) with 67 caregiver–child dyads, the participation on playgroups enhanced children playfulness. In Australia, where is the most of playgroup’s research (McLean et al., 2022), beneficial outcomes for children are also reported such as improved cognitive abilities (Gregory et al.,

2016), better social skills (Williams et al., 2020), and increased readiness for school (Knaus et al., 2016). Other Australian studies, which have used large datasets such as the Australian Early Development Census (AEDC) (Sincovich, et al., 2020) and the Longitudinal Study of Australian Children (LSAC) (Hancock et al., 2012), have also reported learning and developmental benefits associated with playgroup participation for children. These benefits encompass physical health and wellbeing, social and emotional development, language acquisition, and cognitive and communication competence (McLean et al., 2022).

In China, Li and colleagues (2017) developed a RCT assessing impacts of a village-based family-skills training for grandparents and playgroups for young children (up to six-year-old's), in communities with high proportions of left-behind children. In this study, and despite limited implementation and short study period, the authors found that the program enhanced child development. In Australia, three more studies were published using RCT of a playgroup's intervention (Armstrong et al., 2020; Eriksen et al., 2018; Williams et al., 2020). However, except for the study by Williams and colleagues (2020), which focuses on typically developing families, the other two studies focus on specific populations using therapeutic playgroup approaches. Findings from these studies report impacts for the children, such as increased communicative behavior (Williams et al., 2020) and improvements in goal achievement related to performance and function (Armstrong et al., 2020). The systematic review by McLean and colleagues (2022) of 40 studies (from 2010 to 2021) from Australia, Canada, UK, France, Italy, Japan and Hong-Kong demonstrated "social and emotional, language and cognition, communication and general knowledge, physical health and wellbeing beneficial outcomes of playgroup participation for children" (McLean et al., 2022, pp. 15).

1.3.2. Beneficial outcomes for caregivers and families

Research and evaluation studies to date have, in general, indicated that playgroups can also offer benefits for families and/or the caregiver. Several Australian mixed-methods studies refer outcomes for caregivers such as formation of friendships (McLean, et al., 2016), increased knowledge of early childhood services (Guo & Gray, 2017), reduced social isolation (Jackson, 2011), enhanced parenting confidence and self-efficacy (Berthelsen et al., 2012), and greater awareness of children's play (McLean et al., 2018). Other family members, including partners and siblings, may also benefit from the positive outcomes of playgroup participation, such as increased social connections and access to parenting resources (Mulcahy et al., 2010).

Australian experimental studies using RCT with children with developmental delays also found beneficial outcomes for caregivers that participate in playgroups, such as improvements

in self-efficacy, depression and anxiety symptoms, stress, and mother–infant interactions (Armstrong et al., 2020; Eriksen et al., 2018). Also, the engagement of the caregivers seems to be important, as those who are most involved in the playgroups are more engaged in playgroup activities and in interactions with other adults and peers (Williams et al., 2020). Findings also indicate that what most strongly impacted on caregivers perceived effectiveness of playgroups was feeling accepted, providing opportunities for child development, socialization and enjoyment; and enhancing parenting knowledge and skills (Armstrong et al., 2021). For adult caregivers, the systematic review by McLean and colleagues (2022) demonstrated that “social connections and support, parenting self-efficacy, community and organization connections, knowledge of children’s play, learning and development, and enhanced child-adult relationships were beneficial outcomes of playgroup participation” (McLean et al., 2022, pp. 15).

However, a few research also reported that playgroups had reduced effects on parenting styles (Li et al., 2017) and on parental competence (Fabrizi & Hubbell, 2017). Some playgroup experiences were dysfunctional and negative (Gibson et al., 2015), tensions sometimes arose among playgroup participants (Jackson, 2011) and issues of low attendance and high dropout rate are also commonly reported (Berthelsen et al., 2012; McArthur & Butler, 2012). Playgroups offer support and socialization but can also lead to inequality, judgement, and conflicts, with caregivers’ perceptions of support influenced by social factors. These factors can shape caregivers’ realities and interactions, affecting acceptance and engagement (Gibson et al., 2015). So, qualified facilitators with relationship-building skills and community knowledge are essential, along with strategies for engagement and retention. Besides, warm approaches help new members feel a sense of belonging. Therefore, facilitators are crucial to playgroups, by using their knowledge and relational skills to partner with caregivers and enhance engagement and perceived success (Armstrong et al., 2020; Commerford & Hunter, 2017).

1.3.3. Long-term effects

With few exceptions, little is known about the long-term impacts for families and children that participated in playgroups. In an Australian longitudinal study by Hancock and colleagues (2012), the authors found a positive association between continued playgroup attendance from birth to three years and learning competence and social-emotional functioning outcomes for children aged four to five years, particularly those from disadvantaged backgrounds. A similar study by Hancock and colleagues (2015) found that mothers that had persistent playgroup

participation with their children from birth to three years reported more social support from friends, in comparison to mothers whose child did not participate in playgroup.

More recently, in an Australian longitudinal study by Williams and colleagues (2017) with Aboriginal and Torres Strait Islander children, playgroup attendance when children were age two to three years was associated with higher parental engagement in home learning activities when children were aged four years which, in turn, was associated with stronger expressive vocabulary scores for children. Similar results were found in the study by Page and colleagues (2022) with two remote aboriginal communities, in playgroups using the Abecedarian Approach Australia. The authors found that parents who participated in playgroups more frequently were more likely to achieve mastery of Conversational Reading strategies, an element of the approach that involved adult-child interactions, to build children's receptive language, joint attention, and expressive language skills. The findings also suggested that family participation in playgroups and parent mastery of Conversational Reading strategies was positively associated with children's learning outcomes.

While a few longitudinal studies have demonstrated that playgroups provide some benefits to children and families, particularly in relation to social support and learning, weaknesses in the design of these studies limits the internal and external validity of findings. It is important to note, that studies with experimental designs with quantitative data, in which random assignment to intervention and control groups occur, are considered studies of high rigor (Williams et al., 2015).

1.4. Opening the “black box” of playgroup implementation mechanisms

1.4.1. Attendance and dosage

Drawing on its origins in medicine, clinical practice, and research, the concept of dosage is becoming increasingly relevant to a range of social science fields, including education, prevention, and behavioral science (Wasik et al., 2013). Although the notion of dosage is often defined in a variety of ways, with different terminology applied to similar concepts (Berkel et al., 2010; Durlak & Dupre, 2008), it fundamentally refers to the *quantity or amount* of a given intervention.

In ECEC, dosage has multiple dimensions and various components. *Implementation dosage* pertains to the implementation efforts required for the intervention to be executed with accuracy. It encompasses the quantity and quality of training administered to the stakeholders,

enabling them to effectively execute the intervention. *Intervention dosage*, concerns the quantity of intervention administered to children or adults responsible for their care (such as family members or childcare providers) with the aim of altering their behavior (Wasik et al., 2013).

Intervention dosage has various components (session duration, frequency, duration, intended vs. offered and received dosage, intensity, and threshold dosage (for a review see Wasik et al., 2013) and has been operationalized in one of two primary ways: Firstly, as the quantity or timing of a child current involvement in ECEC, and secondly, as the quantity or timing of their overall participation in ECEC. The measurement of *current participation* typically involves calculating the number of hours or days that a child is involved in ECEC per week or per day, or alternatively, the number of days that they have attended in the current year. In contrast, *cumulative participation* is determined by adding up the total number of hours or days that a child has participated in ECEC over an extended period. Furthermore, cumulative participation can also refer to the total amount of exposure a child has had to a particular type of care or specific program, as well as the proportion of their available time that they have spent in formal care (Zaslow et al., 2010).

To date, only one Australian study with typically developed children linked benefits for families with levels of dosage in playgroups, suggesting a dosage effect, through which higher dosage (57% on an average of 11 sessions available to the families) was associated with greater benefits (Berthelsen et al., 2012). The study demonstrated that parents who attended more, frequently reported more benefits in comparison to those who did not attend as regularly, particularly in relation to understanding their children's development. Other studies have associated higher rates of attendance in parenting interventions with enhanced outcomes for families (Nicholson et al., 2008; Williams et al., 2012).

Failing to consider dosage results in an inability to effectively ascertain the precise intervention administered, optimal delivery methods, and the actual worth of the intervention (Wasik et al., 2013; Zaslow et al., 2010). Therefore, comprehending dosage is an essential factor for the progression of research, practice, and policy in playgroups.

1.4.2. The importance of quality

The evidence on parenting support is clear that to be effective, parenting support programs need to be of high quality, to be sustained over long periods, and families need to attend regularly (Whittaker & Cowley, 2012). Playgroups constitute an innovative approach to parenting but also an opportunity to increase access to high-quality ECEC (Berthelsen et al., 2012). Central

to the many definitions of ECEC quality are the necessity to establish (structural and process) standards that guarantee health and safety of children in ECEC environments, a welcoming environment, and conditions for developing, learning and care (Howes et al., 2008; OECD, 2021; Pianta et al., 2005; Slot, 2018).

Structural characteristics are remote indicators of quality, including physical, human, and material resources. Policy makers rely on structural indicators, such as child-adult ratios and funding structures, to assess structural ECEC quality (Barros et al., 2016; Howes et al., 2008; Slot et al., 2015; Thomason & La Paro, 2009). Process quality specifically refers to the overall quality of children's social, emotional, physical, and instructional experiences in ECEC, with an emphasis on their interactions with teachers, peers, and learning materials (Anders, 2015; Barros et al., 2016; Ghazvini & Mullis, 2010; Howes et al., 2008; Slot et al., 2015).

Process quality drives children's development and learning, while structural levers can improve it indirectly (OECD, 2018). Process quality significantly impacts children's development and learning, with positive staff-child interactions and educational activities promoting higher levels of emerging literacy, numeracy, and social skills. Staff qualifications, training, working conditions, and networking in ECEC settings influence staff-child interactions and child development (OECD, 2021).

The existing research on playgroups does not clearly indicate or utilize the dimensions of structural and process quality. In a study by Sylvia and colleagues (2004) which examined preschool provision and care across various settings in the United Kingdom, including nurseries, playgroups, and integrated centers, identified several dimensions of quality, such as staff qualifications, curriculum knowledge, parent engagement, and play activities and interactions. More recently, Commerford and Hunter (2017) identified nine core components of quality specific to playgroups. These include space, activities and play experiences, interactions taking place and the presence of skilled facilitators to engage families. Some of these dimensions, such as having a facilitator and access to play activities and interaction, may promote process quality.

There is very few research about the quality of playgroups. One of the reasons for the lack of studies on playgroups quality may be that when evaluating quality in playgroups, researchers have relied on traditional measures developed for ECEC services (e.g., Early Childhood Environment Rating Scale – Revised, [ECERS-R], Harms et al., 1998, see Melhuish, 1994) or with slight adaptations (e.g., Adult Style Observation Schedule [ASOS], Laevers, 2000, see Ramsden, 1997), which fail to capture dimensions of quality that are specific to playgroups. However, monitoring the quality of playgroups is important to understand how a playgroup can

work to benefit families and children and provide clear and practical indications of how it can be improved.

1.5. The Portuguese supported playgroup model

Playgroups for Inclusion or *Grupos Aprender, Brincar, Crescer* (Groups where children Learn, Play and Grow) were designed as an innovative educational program for Early Childhood Education and Care (ECEC), targeting children aged 0-4 and their families, not participating in the currently available ECEC services in Portugal. The program aimed to increase access to high-quality early childhood education and care, with a particular focus on families belonging to minority groups, such as the Roma, and families whose caregivers were unemployed and underemployed (Barata et al., 2017).

Playgroups for Inclusion aimed to empower children from disadvantaged backgrounds, ensuring that they benefit from early opportunities for learning and development, and hence reduce the likelihood of further school failure, in an informal and multicultural environment. It also had the goal of empowering disadvantaged families and caregivers, enhancing their caregiving environment, parenting skills and mental health, and facilitating socio-professional integration and intercultural dialogue. Additionally, it aimed to empower unemployed members of disadvantaged communities, promoting the opportunity for them to act as playgroup facilitators and community mobilisers (Barata et al., 2017).

To do so, a strong partnership between government institutions and the civil society was established in a consortium effort, creating the optimal conditions for mutual learning, and participation. The consortium Playgroups for Inclusion was coordinated by the Directorate General of Education (DGE) and was constituted by the Fundação Bissaya Barreto (FBB), Calouste Gulbenkian Foundation, ACM-High Commission for Migration, I. P, University of Coimbra and ISCTE - University Institute of Lisbon (Barata et al., 2017; Freitas-Luís et al., 2017).

Playgroups for Inclusion were held in five districts of Portugal. It provided twice-weekly sessions during 10 months to children and their caregivers (dyads), carried out by trained facilitators, and supervised by qualified educators, with the purpose of creating opportunities to learn, develop and increase skills. Activities were designed to meet the needs and interests of the participants, in a climate of interaction, sharing and cooperation with peers (Freitas-Luís et al., 2017).

The Playgroups for Inclusion program was created as a form of supported playgroup, as it included trained facilitators who were paid for their services. These playgroups were designed with a focus on ludic-pedagogical activities, meaning that their main goal was to promote natural learning through play for both children and caregivers. In addition to this, playgroups also aimed to create a positive environment for socialization and well-being for all participants, regardless of age. This was achieved through a variety of activities that encouraged exploration, discovery, and positive interactions between children and their caregivers, as well as between adults and other adults, and between children themselves. By providing a space and time for these interactions, the project aimed to ensure that all participants felt engaged and supported in their learning and socialization. One of the main priorities of the intervention team was to create a welcoming and playful environment that valued the well-being and interactions of the participants (Freitas-Luís et al., 2017).

The facilitators and supervisors recruited for the project were required to have a specific profile: good communication skills, respect and empathy for children and adults, knowledge of the community and to hold at least a high-school diploma. Supervisors needed to hold a university degree in early childhood education and were also expected to have the capacity to organize, develop and implement projects, leadership and team-building competences. In order to guarantee quality experiences in playgroups sessions, three training sessions were provided by the implementation coordination to the facilitators and supervisors (Freitas-Luís et al., 2017).

The role of the facilitators was to organize an environment of safety and wellbeing for the group by establishing and maintaining positive interactions and creating a good ethos; work with the community in a way that enriches children's and caregivers' experience; facilitate activities and experiences drawn from the interests of the group of children and adults; plan and develop activities and experiences inside and outside the playgroup space; work with the district supervisor in individual meetings or group meetings; document each session. Sessions were held in diverse settings (community spaces, schools, libraries, health centers, parish councils, among others) (Freitas-Luís et al., 2017).

The role of the supervisors was to support the facilitators in their work with the families and children, and to promote a time for reflection with each team and amongst all teams. The supervisors had also to document the entire process and to work with the coordinator of the implementation (Freitas-Luís et al., 2017).

During the program, caregivers also had the opportunity to participate in group and one-to-one discussions on various topics, such as health, education and training, personal management and finances, job seeking competences, and personal and professional

development. Additionally, participants had the opportunity to talk about topics of their interest, such as the everyday experiences of children, adults or both (Freitas-Luís et al., 2017).

1.5.1. Playgroups for Inclusion: Experimental and Implementation study

The Playgroups for Inclusion project included an experimental study and a study of program implementation. Families were recruited to the project using three strategies: 1) recruitment through referrals from entities in the community, government and social support network (such as national/regional/local-level policy and decision-makers, social and economic partners, and NGOs); 2) direct recruitment of eligible families through a strong and purposeful dissemination strategy (flyers and posters, Facebook page); and recruitment by referral by participating families (snowball sampling) (Barata et al., 2017).

In order to evaluate the impact of the Playgroups for Inclusion project, a family-level randomized controlled trial was implemented: after pretest assessment of all families, families were randomly assigned to two groups: an intervention group (designated as “Playgroup families”), which offered 10 months of playgroups intervention, and a control group (designated as “Control families”), which offered three months of the intervention after posttest. Despite extensive recruitment efforts, the sample size achieved in the pretest phase was 416 families (44% of the proposed goal), and 257 families (62% of pretest sample) were followed through posttest (Barata et al., 2017).

In the study of program implementation, dosage and quality were given attention considering extant literature on their role as key aspects for playgroups effectiveness (see Walker et al., 2011). From the 25 playgroups that were operating at that moment in the five districts, 13 playgroups were randomly selected (corresponding to 103 caregivers and children), stratified by district, for the purpose of the study of implementation. These playgroups were studied during the implementation period (Barata et al., 2017).

The experience of Playgroups for Inclusion was very positive for both children and caregivers, as well as the partners of the project and the intervention team which includes the facilitators, supervisors and coordination. Results from the experimental trial indicated positive (significant and non-significant) effects on the quality of the home environment, child cognitive development and child temperament and behavior. Results from the implementation study showed that family attendance was quite low across the 10 months of implementation. When analyzing barriers to attendance, from the point of view of facilitators and caregivers, both pointed out particularly health reasons (child or relative) and the lack of transport. Caregivers

also pointed out the session availability as an important barrier to family attendance. The quality of playgroups revealed to be modest (in a first assessment) and improved throughout the implementation. The characteristics that caregivers valued the most, at both assessments, were the welcoming and comfortable environment, the possibility for socialization and the playgroup structure and dynamics. The results also showed that playgroups with more high attending families had higher quality (Barata et al., 2017; Freitas-Luís et al., 2017).

1.6. Current work: relevance and purpose

The focus of this thesis was to extend the experimental trial of an innovative playgroups intervention program in Portugal by testing the effects of dosage and quality on the outcomes of children and families. We also wanted to monitor long-term impacts of this playgroup intervention at two additional time points. Having obtained the approval of the Consortium “Playgroups for Inclusion”, the Portuguese Data Protection Authority and the Iscte Ethics Committee, this thesis was drawn upon original pilot-project data for recruitment, gathering of additional data, and analyses. This thesis is divided into three inter-related studies with the specific aims:

- a) Analyze the role of playgroup dosage (cumulative dosage) on the outcomes for families and children.
- b) Analyze the role of playgroup quality on the outcomes for families and children and;
- c) Analyze the long-term impacts of playgroups on the outcomes for families and children.

With the research from this thesis, we hope to contribute to policy and practice changes in playgroups that may benefit family and, particularly, children better start in life.

How about dosage? Impacts of a playgroup intervention on child and family outcomes

2.1. Abstract

Dosage constitutes a crucial element in understanding implementation research and practice. Research into the significance of dosage for the successful implementation of early childhood interventions and the attainment of desired outcomes is an emerging area of research. In order to replicate and scale-up interventions, understanding how much of the intervention is required to achieve specific outcomes is critical. A challenge in studying dosage effects of early care and education experiences is the absence of randomization on this variable. This study reports the impacts of the Playgroups for Inclusion project for the subset of families and children who were most likely to attend playgroup sessions. Playgroups have been identified as an informal type of early childhood education program. Using the Analysis of Symmetrically Predicted Endogenous Subgroups, we found that children whose profiles predicted that they would attend more than 25% of playgroup sessions experienced higher language scores relative to their control-group counterparts. On the contrary, families and children who were not likely to attend playgroup sessions showed some evidence of unfavorable impacts, except for children's development. Demographic characteristics also showed that disadvantaged families were the families least likely to access these services. Impacts of Playgroups for Inclusion on the likely "high-dosage" families and children is larger in magnitude than intention-to-treat impact estimates produced by prior study.

Keywords: experimental design; subgroup analysis; dosage; playgroup effects, early childhood education and care.

2.2. Introduction

Playgroups are a crucial component of the available services that offer support to families and children during the early years. Their use has been widespread in developed countries for several decades, and in recent times, they have been identified as an adequate albeit more informal alternative of early childhood education program in low- and middle-income countries. This is evidenced by the growing trend of playgroup implementation in such regions (Brinkman & Thanh Vu, 2017).

In the global literature, there is a high degree of consistency in the portrayal of playgroups as recurring and casual gatherings of caregivers and their young children. The primary objective of these gatherings is to provide children with the chance to interact with peers and engage in playful activities (Hancock et al., 2015; Mclean et al., 2022). There are two playgroup categories; Community playgroups, that are parent-led, and Supported playgroups, that typically have a professional facilitator with the children and families (Commerford & Robinson, 2016; Dadich & Spooner, 2008).

The early childhood years are a critical developmental period (OECD, 2018), and playgroups provide a timely and valuable opportunity for children to engage in play and socialize with others and develop diverse set of skills before they start kindergarten or preschool (Hancock et al. 2012). Furthermore, playgroups offer caregivers the opportunity to develop social networks, enhance parenting skills and deepen their understating of their children's development (Commerford & Robinson, 2017; Dadich & Spooner, 2008; Hancock et al., 2015; McLean et al., 2017; Sincovich et al., 2022), and it also fosters community linkages and connectedness (Oke et al., 2007). Playgroups also seem to benefit culturally and linguistically diverse (CALD) parents' social support, connectedness, and parental self-efficacy (Deadman & McKenzie, 2020).

Despite their widespread use, there is limited research that specifically examines the impact of playgroups on families and children outcomes. The aim of this study is to begin to fill this gap using data from the project Playgroups for Inclusion. Playgroups for Inclusion (Barata et al., 2017) was the first randomized controlled trial (RCT) of a playgroup's intervention, prior to the pandemic. Playgroups for Inclusion were designed as supported playgroups with paid and continuously trained facilitators that provided semiweekly sessions during 10 months and were supervised by a hired early childhood educator. The project included an experimental study and a study of program implementation. The study of program implementation aimed to describe playgroup development over the 10 month-period, examining the nature and extent of implementation in key areas such as dosage and quality of playgroups (Barata et al., 2017).

The study of program implementation is as crucial as a carefully rigorously designed impact evaluation of that same program (Durlak & DuPre, 2008). Research on implementation is critical for understanding and improving the effects of an intervention (Durlak, 2010), and an effective implementation is associated with better outcomes (Durlak & Dupre, 2008). Dosage holds significant importance in both intervention research and practice, and it is linked to other central factors related to program implementation including fidelity, content, quality, and exposure (Burchinal et al., 2016; Daro, 2010; Downer & Yazejian, 2013; Paulsell et al.,

2010). Understanding how much dosage of any kind of program in early education and care is needed to achieve positive outcomes in young children is critical, as policymakers and educators try to balance funding challenges while attempting to increase access to early education (Wasik & Snell, 2019).

In the context of experimental evaluations of educational programs, the role of dosage in impact estimation is often overlooked due to the challenge of randomizing individuals to experience varying dosage levels (Arbour et al., 2016 is an exception). Consequently, such evaluations tend to provide only an estimate of the average effects of exposure to an intervention. This is even though individual exposure can range from nonparticipation to the intervention-specific maximum participation (Moulton et al., 2014). As a result, a comprehensive understanding of the impact of dosage on intervention outcomes remains elusive.

This study implements one methodological approach to quantifying the effects of dosage on educational program impacts, the Analysis of Symmetrically Predicted Endogenous Subgroups (ASPES, Peck, 2013), to estimate the relative effects of varying levels of a playgroup intervention dosage on home environment and caregiving practices, and on children's cognitive development, temperament and behavior.

2.2.1. The role of dosage in Early Childhood Education and Care

In the literature of ECEC, dosage has been conceptualized in two main ways (Wasik et al., 2013; Wasik & Snell, 2019; Zaslow et al., 2010). The first approach entails measuring the quantity and timing of current involvement in ECEC, typically quantified by the number of hours or days of attendance per week or year. The second approach, cumulative participation, involves assessing the total amount of hours or days of participation in ECEC across multiple years. Additionally, cumulative care may refer to the extent of exposure to a particular form of care or program, as well as the percentage of available time spent in formal care, and can be operationalized as, for example, attendance to a particular program (Zaslow et al., 2010). Research into the significance of dosage for the successful implementation of early childhood interventions and the attainment of desired outcomes is having increased attention.

Predominant conceptualizations of ECEC dosage include attendance/absenteeism, the number of hours a week, and attending one versus two preschool years (Arbour et al., 2016; Neuman & Dywer, 2009; Melo et al., 2022). Generally, it has been showed that greater attendance and longer duration of ECEC is linked to enhanced academic and behavioral outcomes (Ansari & Purtell, 2018; Ehrlich et al., 2018; Shah et al., 2017; Xue et al., 2016),

suggesting that more of an intervention (e.g., number of hours a day, years, attendance) is better and will result in increased positive outcomes. However, some literature has pointed to potential negative effects of more hours in care during the first years of life, noticing less social competence and more behavioral problems in children (NICHD, 1998; NICHD, 2006). Though, much of this evidence relates to the United States (US). One of the primary motivations behind offering ECEC in US is to address the achievement gap stemming from income inequality, and to enhance children's readiness for school (Jensen & Rasmussen, 2019). In European countries, there is relatively less emphasis on equipping children with academic skills before they start school, and more emphasis on fostering their social development (Jensen & Rasmussen, 2019). Even though income disparities between groups are generally narrower in Europe than in the US, there are still disparities in academic achievement between children from different income backgrounds (Jensen & Rasmussen, 2019). As a result, policymakers are exploring the potential of ECEC as a means of narrowing such gaps (OECD, 2006).

There is also evidence that ECEC in Europe has positive effects (Hagen, 2017; Ulferts et al., 2016), but generally there is substantially less research on European ECEC than for the US. European studies on ECEC dosage are even scarce. Generally, there is a lack of consensus in literature regarding the relation between the amount of childcare attendance and its impact on children's developmental outcomes (Melhuish et al., 2015). In a Norwegian study by Zambrana and colleagues (2015) with more than 1000 children, the authors found a tendency for a dose-response relation between years that children attended ECEC (two to three years) and their language competence at four years. However, in a German study by Felfe and Zierow (2017), the authors found that the introduction of additional full-day childcare opportunities had a positive impact on the school readiness of children but had an adverse effect on the socio-emotional development of immigrant children. In a meta-analysis of the effects of universal ECEC on child development and children's later life outcomes, with 30 studies from US, Canada, Australia, France, Germany, Norway, Spain and the UK, it was showed that children benefit more in the cognitive domain (e.g., math and reading skills) than in the non-cognitive domain (e.g., social skills) (Huizen & Plantenga, 2018). Furthermore, evidence also indicates that the advantages of ECEC are not distributed uniformly. In fact, children from disadvantaged backgrounds tended to experience greater benefits compared to their more privileged counterparts, possibly due to limited access to enriching home environments and alternate high-quality preschool care (Elango et al., 2015; Huizen & Plantenga, 2018).

A challenge in studying the effects of ECEC experiences, such as dosage, is the absence of randomization on this variable. The experimental study of Arbour and colleagues (2016) about

a preschool intervention in Chile on children's language overcame this challenge by using a regression-based subgroup approach (Kemple et al., 2001; Peck, 2003, 2013). This approach allowed the researchers to create a likelihood of absenteeism index that was used within the randomized design to provide unbiased estimates of program–control group differences in outcomes for children at differing levels of the absenteeism index. The authors found that: “individual children's likelihood of absenteeism moderated the intervention's impact on children's language and literacy outcomes such that there were positive impacts of the intervention only for children with the lowest likelihood of absenteeism” (Arbour et al., 2016, pp. 1).

2.2.2. Playgroup dosage and associated family and child outcomes

There is some evidence showing that continued participation in playgroups is associated with better outcomes (Hancock et al., 2015). In the study “Breaking Cycles, Building Futures”, authors found that when attendance in playgroups is established, playgroups have the potential to increase a broader engagement with parents to meet needs in other areas, such as social isolation (with increased contact and support for parents), and stimulation and socialization for their children (Armstrong et al., 2019b; Oke et al., 2007).

Until this date, only one non-experimental Australian study linked benefits for families with levels of dosage in playgroups, suggesting a dosage effect, through which higher dosage (57% on an average of 11 sessions available to families) was associated with greater benefits (Berthelsen et al., 2012). The study demonstrated that parents who attended more frequently reported more benefits in comparison to those who did not attend as regularly, particularly in relation to understanding their children's development. There was a higher level of attendance by parents who were considered by facilitators to be more highly engaged with other parents, their own children and the facilitator. One main reason because dosage can be so important is that low levels of dosage undermine potential program effectiveness (Berthelsen et al., 2012). We also know that to be effective, parenting support programs, such as playgroups, need to be of high quality, to be sustained over long periods, and families need to attend regularly (Whittaker & Cowley, 2012).

More recently, a couple of US studies found that higher frequency in playgroups has benefits for children with externalizing (e.g., disruptive behavior) and/or internalizing problems (generalized anxiety disorder) and children with disabilities. In the study by Bekar and colleagues (2016) with children ages two to four years, higher frequency of participation, with playgroup sessions held twice a week instead of once, was positively correlated with increased

social competence and reduced behavioral issues among the children. Similarly, Fabrizi and colleagues (2016) found that participation in an 8-week playgroup with caregivers and a therapist resulted in increased playfulness and responsiveness among children aged 15 months to 3 years with special needs.

Research has shown that playgroup attendance can have positive effects on children's development and learning, including enhanced playfulness (Fabrizi & Hubbell, 2017), cognitive abilities (Gregory et al., 2016) and preparedness for school (Knaus et al., 2016). Studies from Australia, using large data sets, have found that children who attend playgroups are likely to benefit from improved physical health and wellbeing, as well as language, communication, and cognitive competence (Hancock et al., 2012; Sincovich et al., 2020; Williams et al., 2020). These findings suggest that playgroups can be a valuable and effective way for young children to learn and develop important skills in various areas. However, studies assessing the outcomes for children are limited and typically rely on parent and facilitator reports.

Family engagement and participation in playgroups for families with certain risk factors, such as single-parent, isolated families (Oke et al., 2007), or children growing up in areas associated with socioeconomic disadvantage (Krahe et al., 2020), is challenging. However, factors such as social vulnerability, situations of family violence, poverty, belonging to a cultural minority or the possession of personal feelings of failure, have been associated with caregivers' preferences for playgroups in detriment of other formal early childhood services (Williams et al., 2015). Sometimes families find themselves in extremely complex situations that make them leave the service (Eddy, 2003; Johnston & Sullivan, 2004).

Previously identified barriers for attendance include location and transport (because of high cost or lack of public transportation); the scheduling of sessions (because they do not meet the availability of all families), and the lack of confidence and consistency of the facilitators (Eddy, 2003; Johnston & Sullivan, 2004). In the Playgroups for Inclusion project (Barata et al., 2017), health reasons (child or relative) and the lack of adequate transport to the playgroup were reported as barriers to attend. Caregivers also pointed out the session schedule as an important barrier to family attendance. Such barriers, external to actual program quality or implementation, were also found in other playgroups' studies (see Berthelsen et al., 2012).

2.2.3. Evaluation of the Playgroups for Inclusion project

Playgroups for Inclusion, was funded by the European Union Programme for Employment and Social Solidarity - PROGRESS (2007-2013) with the purpose to create, evaluate, and distribute

a novel educational program for Early Childhood Education and Care (ECEC), specifically geared towards young children between the ages of zero and four, as well as their primary caregivers, who were not utilizing any of the ECEC services offered in Portugal at that time (Barata et al., 2017; Freitas-Luís et al., 2017).

The project intended to answer the needs and interests of children and their caregivers, through dialogue, play and educational and ludic activities. The project central components were the creation of spaces of wellbeing and socialization. The personal relations and the creation of an emphatic, respectful, cooperating and sharing environment, were one of the major goals. Sessions had an informal nature and encouraged the interaction of children with other children, with their caregiver and with other adults and the interactions between adults providing a healthy socialization and experimentation environment, culturally sensitive and stimulating in order to promote learning (Freitas-Luís et al., 2017).

The Playgroups for Inclusion project was held in five from the 18 districts of Portugal in the communities that could potentially have more eligible children aged up to four years old and not participating in the currently available ECEC services. The project offered twice-weekly sessions during 10 months to children and their caregivers (dyads), carried out by trained facilitators, and supervised by qualified educators, with the purpose of creating opportunities to learn, develop and increase skills. Activities were designed to meet the needs and interests of the participants, in a climate of interaction, sharing and cooperation with peers. The activities might include music and singing, imaginative play, outdoor and free play, art and craft activities with their children, among others.

In the Playgroup for Inclusion project the children and families were randomized within each district where playgroups were implemented in two conditions: the intervention group (henceforth referred to as playgroup families), which was offered a 10-month program, and the control group (henceforth referred to as control families), which received a brief version of the program (3 months) in the following year. A Theory of Change (Weiss, 1995; Connell & Kubisch, 1998; Anderson, 2005) underpinning playgroups and the core intended outcomes of playgroups was developed and revised frequently given the existing evidence base and the practice and research knowledge of the team of practitioners and researchers, in order to select a set of primary and secondary outcomes for measurement.

Results of the experimental trial indicated largely non-significant mixed experimental impacts of the intervention for participating children, caregivers and families. For the children, playgroups improved their developing ability to reason through manual and visuospatial problems, use language for comprehension, inhibit poor behavior, and focus on task. For the

caregivers, playgroups improved the extent of responsiveness and involvement in learning and stimulating the child. One explanation for the lack of playgroup impacts is that the levels of attendance were quite low across the 10 months of playgroups (38%) and that almost half of the subsample only attended 25% of the sessions. This average attendance rate is, however, similar to attendance rates at comparable programs that target high-risk groups (Baker et al., 2011; Nicholson et al., 2008).

Some family demographics characteristics were particularly important in the variations on attendance: Low attending families had, typically, the following characteristics: they were younger, less likely to have graduated from high school, and lived in households with lower household incomes. The researchers also analyzed low and high-dosage subgroups defined by the percentage of sessions that each family attended (Barata et al., 2017). This analysis generally demonstrated benefits in child and caregiver outcomes for those who attended 25.1% to 50% of the sessions, when compared to those who only attended 25% or fewer of the sessions, in increased Practical Reasoning and Effortful Control for the children and higher Responsiveness for the caregivers, for example. Although dosage results seemed to indicate effects in the expected direction – higher attendance, higher dosage, more positive results - it is important to note that these results were non-experimental, estimated only for the intervention group, and prone to self-selection bias.

Previous research has indeed used experimental design to estimate playgroup impacts on the intervention group. However, non-studies have rigorously estimated the impact of playgroups on high and low-dosage subgroups in a way that capitalizes on the experimental design. Families in the intervention group who were high attendees on playgroup sessions may have different unobserved characteristics from families who were low attendees. Therefore, comparing the playgroup families high attendees to control group families (which include families who would be both high attendees and low attendees had they been assigned to the intervention group) would produce biased estimates using a nonrandomly selected sample from the intervention group (Moulton et al., 2014). This study overcomes this challenge.

2.2.4. The ASPES method to estimate dosage effect

Quantifying the impact of dosage on the outcomes of playgroups – or other early childhood services - is a challenging task for researchers since families are typically able to decide the extent to which they receive playgroup services. In specific, families who receive high-dosage of the intervention differ systematically from those who receive low-dosage (Moulton et al., 2014). Therefore, comparing high-dosage playgroup families to the control families would

produce biased playgroups effects, as high-dosage families are a selected sample, possibly being more motivated or in greater need than the average control group families (Moulton et al., 2014). This empirical challenge is highlighted in a systematic literature review on playgroups by Mclean and colleagues (2022) and typically is pointed out on the limitations of the studies (Armstrong et al. 2020; Melo et al., 2022; Sincovich et al., 2020).

Furthermore, the difficulty in estimating subgroup impacts on high-dosage families arises from the lack of direct observation of control group families who would have been high-dosage had they been offered the playgroup intervention. In other words, control group counterparts to high-dosage intervention group families are not observable. The ASPES method uses observed baseline characteristics, that are not influenced by the intervention, to form distinct subgroups within the sample, each representing a specific dosage level associated with a particular set of characteristics (Peck, 2013). By doing so, the ASPES method ensures that these subgroups are experimentally valid for analyzing the effects of the intervention (Peck, 2013). The ASPES method was successfully used in the Head Start Impact Study (Peck & Bell, 2014) analyzing, for the first time, the role of quality in influencing children's developmental progress. Despite the authors found little evidence that Head Start's impact varies by the level of quality (using the measures of quality available at that time), the ASPES method addressed some analytic challenges such as defining the construct and numerous dimensions of quality and making "quality" measurable with validity and reliability from the study's data. Another successful use of the ASPES method was in the Moving to Opportunity impact study (Moulton et al., 2014). The authors found, for example, that children whose profiles predict that they spent more time in lower-poverty neighborhoods improved mental health outcomes relative to their control-group counterparts. Those results had implications for federal evaluation policy and for housing mobility policy, such as demonstrating that a housing mobility treatment has the potential to improve near-term family health outcomes (Moulton et al., 2014).

2.2.5. Current study

This study offers a new estimate of playgroup impacts, based on those families and children whose set of characteristics indicate that they experienced a higher dosage of the playgroup intervention. We measured the impact of being more likely to experience a higher dosage of the playgroup intervention, i.e. attending more playgroup sessions, on home environment and caregiving practices, and on children's cognitive development, temperament, and behavior, compared to being more likely to experience a lower dosage of the playgroup intervention.

We explored two research questions:

1) What is the impact of the playgroups for inclusion intervention for the families and children who were predicted to receive a high-dosage of playgroups sessions?

2) What is the impact of the playgroups for inclusion intervention for the families and children who were predicted to receive a low-dosage of playgroups sessions?

For the subset of sample families who received a higher dosage of playgroup intervention, we may expect that effects are both larger in magnitude and present across a broader range of outcomes, when compared to families who received a lower dosage of the playgroup intervention.

2.3. Method

2.3.1. Data Sources and Outcomes

The Playgroups for Inclusion study evaluated 416 families and children from 5 districts of Portugal. Playgroups for Inclusion restricted-use data included baseline and impact-evaluation data for one adult (caregiver) and child (see Table 2.1.). The pretest took place in August 2015 and the posttest took place one year after.

Participating children were on average 18 months, ranging from 18 days to 50 months. Approximately 48% were female (n=198). Approximately 4% of the children had already attended ECEC prior to enrolling in playgroups (n=18).

Table 2.1. Baseline characteristics of the pretest sample.

Variables	N	Mean/% (SD)	Min.	Max.	Skew	Kurt
<i>Family variables</i>						
Referred by entities	416	63.20%	0	2	.70	-1.10
<i>Child variables</i>						
Age (months)	416	17.53 (11.61)	0	50.63	.47	-.63
Female	416	47.70%	0	1	.09	-2.00
Attended ECEC	412	4.30%	0	1	4.48	18.17
Number of siblings	413	1.08(1.27)	0	6	1.37	1.97
Number of siblings below age 6	384	.32(.55)	0	2	1.56	2.06
<i>Caregiver variables</i>						
Age (years)	406	34.13(10.82)	14	75	1.48	2.76
Female	416	95.20%	0	1	-4.24	16.07
Employed	409	30.00%	0	1	.85	-1.29
Secondary education	402	51.90%	0	1	-.15	-1.99
Cohabiting	401	78.60%	0	1	-1.63	.67
<i>Caregiver household</i>						
Income (range in €)	381	3.85	1	10	.83	-.51
No welfare	400	69.80%	0	1	-.86	-1.26
Number of people	416	4.21 (1.46)	1	9	.96	.84

Note: The caregiver household income labels below and above the mean are: 3=758€ to 1010€; 4=1011€ to 1262€.

Concerning the participating caregivers, the mean age was 34 years, 95% were female (n=396), 52% completed the secondary education (n=216), and 79% were cohabitating (i.e., living with a partner, n=327).

Regarding the caregivers' household, only 30% of the caregivers were employed (n=125). The mean household income was approximately between 379€ to 631€³ and approximately 9% of the household incomes were not reported. Approximately 60% of the household income were above the minimum wage per employed adult (n=247). In the sample, 63% of the families were referred by entities, such as community health centers and child protection services.

After the pretest, 225 families were randomly assigned to the intervention condition and 191 to the control condition. The experimental and control groups were statistically balanced, as one would expect through randomization (see Table 2.2.).

³ The monthly minimum wage in Portugal in August 2015 was 530€/month. At the current date of this study (May 2023) the minimum wage is 760€/month (DGERT/MTSSS, 2022).

Table 2.2. Baseline characteristics by assigned randomization group.

	Intervention group		Control group			
Variables	n	Mean/% (SD)	n	Mean/% (SD)	t	df
<i>Family variables</i>						
Referred by entities	225	48.90%	191	35.00%	-.91	414
<i>Child variables</i>						
Age (months)	225	19.03 (11.48)	191	18.22 (11.78)	-.71	414
Female	225	51.00%	191	44.00%	-1.36	414
Attended ECEC	223	4.00%	189	4.00%	-1.24	410
Number of siblings	224	1.03 (1.30)	189	1.14 (1.23)	.85	411
Number of siblings below age 6	210	.30 (.54)	174	.34 (.55)	.72	382
<i>Caregiver variables</i>						
Age (years)	219	34.33 (10.96)	187	33.90 (10.68)	-.40	404
Female	225	96.00%	191	95.00%	-.38	414
Employed	221	30.00%	188	31.00%	.12	407
Secondary education	220	56.00%	182	51.00%	-1.16	400
Cohabiting	220	80.00%	181	83.00%	.62	399
<i>Caregiver household</i>						
Income (range in €)	202	3.96	179	3.72	-.83	379
No welfare	216	70.00%	184	69.00%	-.29	398
Number of people	225	4.14	191	4.29	1.01	414

Note: The caregiver household income labels below and above the mean are: 3=758€ to 1010€; 4=1011€ to 1262€.

In this study, to address concerns of limited statistical power, we prioritized as primary outcomes the measures that were applied to the full sample of children and families, and presented higher quality according to data and data collection experience. Therefore, we selected the first three main outcomes and the secondary outcomes of the Theory of Change for the Playgroups for Inclusion project where the primary results were more expected. Table 2.3. provides variable definitions for the outcomes.

Table 2.3. Definition of the outcomes of interest.

<i>Outcome</i>	<i>Format</i>	<i>Definition</i>
<i>Home environment and caregiving practices</i>	Direct observation and Caregiver Interview	Caregivers' interactions with the children. Includes culturally sensitive items describing caregivers' warmth, control, and academic stimulation of their children. The outcome is coded 0 if it is not observed and 1 if observed.
<i>Child cognitive development</i>	Direct child assessment	The child was evaluated using a standardized measure. Includes the subscales of Hearing and Language/Language, Performance and Practical reasoning
<i>Child temperament and behavior</i>	Caregiver Interview	Caregivers were asked about the temperament and behavior of their children, using a 7-point Likert scale: Includes the subscales of Negative affect and Effortful control

Outcomes of interest related to the caregiver included home environment and caregiving practices measured with the Home Observation for Measurement of the Environment (HOME, Caldwell & Bradley, 1984; adapted for the Portuguese population by Abreu-Lima, 2009). HOME subscale scores are usually computed by summing the total number of correct items (Abreu-Lima, 2009). However, because two out of the four subscales (i.e., Responsivity and Acceptance) are applied to both age groups and have a different number of items for each age group, a simple sum of correct items would make total scores non-comparable between age groups. Moreover, several children changed from one age group (0-2) to another (2-4+) from pretest to posttest (77 and 76 cases for Responsivity and Acceptance, respectively). To address this problem, we used the percent of correct items per subscale as our total (primary) outcomes and pulled together subscale totals for the two age groups.

Descriptive statistics for the two specifications for all subscales are presented in Table 2.4. In the present study, Cronbach's alpha varied between 0.52 and 0.72 for Responsivity (T1 and T2 for 0-2 and 2-4 years), between 0.41 and 0.64 for Acceptance (T1 and T2 for 0-2 and 2-4 years), between 0.41 and 0.56 for Involvement (T1 and T2 for 0-2), and was 0.73 for Academic Stimulation (T1 and T2 for 2-4 years).

Table 2.4. Descriptive for HOME subscale scores at Pretest and Posttest, using percent of correct items per subscale

Subscales	N	% (SD)	Min.	Max.	Skew	Kurt	Alpha	
							Under 2	Above 2
T1 Responsivity	408	49.20 (15.72)	0	68.75	-.63	-.16	.72	.52
T2 Responsivity	254	45.20 (14.70)	6.25	68.75	-.04	-.41	.63	.61
T1 Acceptance	408	64.39 (15.38)	0	100	-.73	.21	.41	.52
T2 Acceptance	255	53.97 (20.01)	0	100	-.20	.01	.56	.64
T1 Involvement	270	63.46 (28.34)	0	100	-.23	1.81	.41	
T2 Involvement	101	74.91 (25.99)	0	100	-.81	2.61	.56	
T1 Academic Stimulation	123	58.37 (32.03)	0	100	-.54	2.09	.73	
T2 Academic Stimulation	150	70.80 (29.37)	0	100	-.99	3.07	.73	

Outcomes of interest related to children includes the children's cognitive development, temperament, and behavior. Children's development was measures with the Griffiths Mental Development Scales (GMDS; Griffiths, 1954; 0-2 years old: Huntley, 1996; 2-8 years old: Luiz et al., 2006). GMDS subscale raw scores were computed by adding the total number of correct items. This computation procedure follows the GMDS 0-2 years Manual (Huntley, 1996), which differs from the one presented in the GMDS 2-8 years Analysis Manual (Luiz et al., 2008)⁴, but it was carried out for children of all ages to allow for comparison of results across the two age groups. We used the computation procedure described in the GMDS 2-8 years Analysis Manual (Luiz et al., 2008) as a robustness check for the results of the impact analyses.

Descriptive statistics for the subscales are presented in Table 2.5. In previous Portuguese studies, Cronbach's alpha for the global scale was .98 and .97 (Pinto et al., 2013), and .97 (Borges et al., 2012). In the present study, Cronbach's alpha was similar: .98 and .97 for language, .98 and .96 for performance, and .86 and .92 for practical reasoning subscales (at T1 and T2, respectively by subscale)⁵.

⁴ According to the GMDS analysis manual for 2-8 years (Luiz et al., 2008), the procedure to compute the subscale raw scores comprises: dividing the total number of items passed on the section I (first year of life) and section II (second year of life) by the total number of items in each of these sections, and multiplying each quotient by 12; and adding these products to the total number of items passed on in the 2-8 years sections, multiplied by two; in the case of the practical reasoning subscale (which includes only 2-8 years sections), the scores of first and second sections are calculated using the mean of the other subscale scores.

⁵ We did not compute a global reliability score because we did not use all the subscales in the GMDS.

Table 2.5. Griffiths Mental Development Scales Scores at Pretest and Posttest.

Variables	N	Mean (SD)	Mental Age (months)	Min.	Max.	Skew	Kurt	Alpha
T1 Hearing and Language	393	38.62 (17.67)	15.50 ^a	3	79	-.03	2.15	.98
T2 Hearing and Language	223	51.16 (14.21)	22.00 ^a	17	85	.15	2.26	.97
T1 Performance	390	38.81 (17.29)	15.00 ^a	2	76	-.34	2.17	.98
T2 Performance	237	52.30 (11.62)	24.00 ^{ab}	25	74	-.36	2.29	.96
T1 Practical Reasoning	123	3.94 (3.74)	28.00 ^b	0	14	.66	2.35	.86
T2 Practical Reasoning	125	6.58 (5.70)	32.00 ^b	0	25	.90	3.75	.92

Note. ^a Average mental age was calculated according to the GMDS 0-2 years Manual (Huntley, 1996);

^b Average mental age was calculated according to the GMDS 2-8 years Analysis Manual Luiz et al., 2008).

Mean raw scores in the 3 subscales (language, performance, practical reasoning) were converted into mental age equivalents, for descriptive purposes. In the pretest, means scores obtained corresponded to mental ages of 15 and a half months in Language, 15 months in the Performance, which were slightly below the mean chronological age (18.6 months), and 28 months in practical reasoning (this subscale was only applied to the children in the 2-8 age group). In the posttest, means scores obtained corresponded to mental ages of 22 months in Language, 24 months in Performance, which were below the mean chronological age (29.1 months), and 32 months in practical reasoning.

Temperament and the behavior of children over 18 months was measured using the Very Short Form of the Early Childhood Behavior Questionnaire (ECBQ, Putnam et al., 2002; translated and adapted with the authorization of the authors by Klein & Linhares, 2006; Very Short Form developed by Putnam et al., 2010). In the study of the development of the Short Form of the ECBQ, the Cronbach's alpha was .70 for negative affect subscale, and .72 for effortful control subscale (Putnam et al., 2010). In the present study at pretest and posttest respectively, Cronbach's alpha was .62 and .63 for negative affect subscale, and .53 and .65 for effortful control subscale. Descriptive statistics for the subscales are presented in Table 2.6.

Table 2.6. Descriptives for Temperament and Behavior Subscale Scores at Pre and Posttest.

Variables	N	Mean (SD)	Min.	Max.	Skew	Kurt	Alpha
T1 Negative Affect	188	3.08 (.89)	1.17	6.17	.27	2.68	.62
T2 Negative Affect	210	3.14 (.91)	1.10	5.60	.45	2.85	.63
T1 Effortful Control	188	4.95 (.74)	3.00	6.72	-.18	2.72	.52
T2 Effortful Control	210	4.95 (.72)	2.36	6.58	-.32	3.23	.56

2.3.2. Playgroup dosage measure

Session attendance was registered in each session in a monthly form by the playgroup facilitators, which marked “present” if the families attended some part of each session. When newly enrolled families showed up to the group previously assigned by randomization, their names were added to the form with the date of enrolment. Every month and throughout the 10 months of implementation, the facilitators sent the form to the supervisors that then were sent to the implementation team. In the end we had dosage data for 197 families of the intervention group (85%). Families and children with dosage data were found to be statistically similar to families without dosage data in all but one of the baseline characteristics (see Appendix A): families and children with dosage data were significantly more likely to have enrolled directly in the playgroups (or have been referred to the groups by other families) than families and children without dosage data.

The measures of dosage were converted to total number of sessions measured, total number of sessions present and percent-days present per child, consistent with prior studies of attendance in playgroups (Berthelsen et al., 2012). The number of sessions available to each family during the implementation varied from one family to another (ranged from 22 to 77, $M = 61.2$; $SD = 13.9$) due to different enrollment dates and dropouts. The number of sessions attended by all families ranged from 0 to 70 ($M = 31.5$; $SD = 30.1$) and the number of sessions that the families were absent ranged from 1 to 76 ($M = 31.7$; $SD = 20.2$). From the total number of enrolled sessions for any playgroup that a family could attend, families attended, on average, 36%.

We defined families as high attendees (high-dosage) if they had attended 25% or more of playgroup sessions, and as low attendees (low-dosage) if they had attended less than 25% of playgroup sessions. Using this definition, at least 44.1% ($n=101$) of the intervention group were high attendees. In support for our choice of measure, the previous study (Barata et al., 2017) demonstrated benefits in child and caregiver outcomes for those who attended 25.1% to 50% of the sessions, when compared to those who only attended 25% or fewer of the sessions.

2.3.3. Data analysis approach

Using data from the Playgroups for Inclusion project, this research applied the methodological approach developed by Peck (2003) to create experimentally valid subgroups defined by attendance on playgroups and then estimate playgroup's effects on those who attended to more playgroup sessions, in comparison with control families. In sum, this methodology relies on exogenous baseline characteristics (i.e., unrelated to the intervention indicator) to create dosage subgroups. This approach has been termed as "*Analysis of Symmetrically Predicted Endogenous Subgroups*" (ASPES, Peck, 2013, pp. 225).

ASPES involves three stages: 1) Identify subgroup membership using a strategy that ensures symmetric prediction; 2) Estimate impacts on predictive subgroups; and 3) Convert from impacts on predicted subgroups to impacts on actual subgroups. Because of data constraints, we could not implement this final step. However, according to Moulton and colleagues (2014) because the predicted subgroups are symmetrically identified within the experimental and control groups, the estimate of the impact on those subgroups is unbiased from selection or other sources of bias, and so is warranted.

2.3.3.1. Stage 1: Identify subgroup membership using a strategy that ensures symmetric prediction

In Stage 1 of the ASPES method, the probability of being in a subgroup is modeled as a function of baseline characteristics, using a logit model. As Moulton and colleagues described (2018), the goal of this prediction process is to identify which playgroup families and control families have the baseline characteristics associated with being exposed to a low or high-dosage of playgroup attendance. First, we defined subgroups based on actual values of playgroup participation for playgroup families. For playgroup families, we formed two subgroups based on the percentage of playgroup sessions that families attended, as follows:

High-dosage subgroup: families and children who attended 25% or more of playgroup sessions.

Low-dosage subgroup: families and children who attended 25% or fewer of playgroup sessions.

To ensure the comparability of subgroups in playgroup and control families without loss of sample, we used a cross-validation approach⁶ to predict subgroup membership. "This process

⁶ A cross-validation approach ensures that the subgroups are symmetrically identified. This ensures that no one is any better identified than the other, thereby retaining the integrity of the experimental design (Moulton et al., 2014).

ensures that the predicted subgroup membership for every individual in the sample is constructed through out-of-sample prediction, allowing us to use the full sample for analysis without inducing overfitting bias” (Moulton et al., 2018, pp 266), as suggested by Peck (2003) and elaborated by Harvill and colleagues (2013). Using all the data from playgroup families for prediction and for impact analysis can introduce bias because of the better fit that is certain for the sample that is used for modeling (Abadie et al., 2018).

The cross-validation approach involved the following steps:

1. Randomly partition the entire sample into ten, mutually exclusive cross-validation groups;
2. For members of the playgroup families, we used a logit model for the relationship between baseline characteristics of the families and children and the playgroup dosage ten times, each time leaving out one of the ten cross-validation groups and using the remaining 90 percent of the playgroup families group for prediction. A logit model was used to estimate the following model:

$$p_i = \alpha + X_i\lambda + \mu_s + \varepsilon_{li} \quad (2.1)$$

where

p_i is a binary variable denoting actual high-dosage subgroup membership;

X_i is a vector of baseline characteristics (child: age, gender; caregiver: age, gender, employment status, educational level, cohabitation status, income);

μ_s is a set of site fixed effects (four dichotomous variables indicating which of 5 districts the playgroup was located);

α and the λ vector are model coefficients;

ε_{li} is a child-caregiver random error term; and the subscript i indexes individuals.

Following the preparation notes for the ASPES method by Moulton and colleagues (2014) for the selection of baseline covariates, the baseline characteristics included in Equation 2.1 prediction model were selected based on theory and past research from the project Playgroups for Inclusion.

3. Based on the model fit on the sample for 90 percent playgroup families, the ASPES method generated estimated probabilities for the left-out 10 percent cross-validation group (which includes both members of playgroup families and control families). This step generated a continuous score that represents the estimated probability that a given family or child is a member of a specified subgroup, given their profile of baseline covariates;

4. Given the actual frequency of low and high-dosage families in the intervention group, we used a cutoff of 50% to divide the estimated probability of dosage subgroup belonging. If the estimated probability was greater than or equal to .50, then the family would be placed in the predicted high-dosage subgroup; otherwise, it would be assigned to the predicted low-dosage subgroup. Table 2.7. presents correct placement rates into predicted subgroups. It shows that 52% of playgroup families who are predicted to be in the low-dosage subgroup are actually in the low-dosage subgroup; and 70% of playgroup families who are predicted to be in the high-dosage subgroup are actually in the high-dosage subgroup. The overall correct placement rate was 43%, which is a little below to correct placement rates attained by other studies (e.g., Moulton et al., 2014; Moulton et al., 2018; Peck & Bell, 2014). However, the performance of the prediction model was 0.22, which is sufficient (≥ 0.05) to provide consistent estimates of impacts (Harvill et al., 2013).

Table 2.7. Correct Placement Rates for Subgroups Based on Predicted Number of Playgroup Sessions Attended.

	Playgroup families predicted low- dosage	Playgroup families predicted high-dosage	Playgroup families in each actual subgroup
Playgroup families actually low-dosage	50 ($w_{LL} = 0.52$)	46 ($w_{LH} = 0.48$)	96
Playgroup Families actually high-dosage	30 ($w_{HL} = 0.30$)	71 ($w_{HH} = 0.70$)	101
Playgroup families in each predicted subgroup	80	117	Total playgroup families = 197

Note. w_{XY} is the proportion of predicted Subgroup Y members who are actually in the Subgroup X, where L and H correspond to low and high-dosage subgroups, respectively.

Table 2.8. presents the baseline characteristics for predictive low-dosage and high-dosage subgroups. It shows that the predictive high-dosage subgroup is significantly different from the predictive low-dosage subgroup on 10 out of 14 baseline characteristics.

Table 2.8. Baseline Characteristics for Predicted Low and High-dosage Subgroups.

	Predicted low-dosage subgroup		Predicted high-dosage subgroup			
Variables	n	Mean/% (SD)	n	Mean/% (SD)	t	df
Family variables						
Referred by entities	185	25.00%	231	48.00%	-4.74***	414
Child variables						
Age (months)	185	18.24 (11.79)	231	18.99 (11.49)	-65.5	414
Female	185	47.00%	231	48.00%	-.21	414
Attended ECEC	183	3.00%	229	5.00%	-.97*	410
Number of siblings	184	1.26 (1.26)	229	.94 (1.26)	2.53	411
Number of siblings below age 6	170	.38 (.58)	214	.28 (.52)	1.72**	382
Caregiver variables						
Age (years)	185	30.04 (6.40)	221	37.56 (12.47)	-7.43***	404
Female	185	98.00%	231	93.00%	2.27***	414
Employed	185	27.00%	224	33.00%	-1.41**	407
Secondary education	185	38.00%	217	67.00%	-6.16*	400
Cohabiting	185	71.00%	216	90.00%	-5.01***	399
Caregiver household						
Income (range in €)	185	2.55	196	5.07	-9.55***	379
No welfare	181	51.00%	219	85.00%	-8.06***	398
Number of people	185	4.41	231	4.05	2.5	418

Note: The caregiver household income labels below and above the mean are: 3=758€ to 1010€; 4=1011€ to 1262€.

~ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

2.3.3.2. Stage 2: Estimate impacts on predicted subgroups

The second step is to calculate an intent-to-treat (ITT) impact estimate for each predicted subgroup on the outcomes described in Table 2.3. For each outcome, we computed regression-adjusted impact estimates on each subgroup using an ordinary least squares (OLS) regression model.

Conducting this analysis separately for families and children predicted to be in the high and low-dosage subgroups produces the estimated impact of playgroups on the predicted high-dosage subgroup and the estimated impact of playgroups on predicted low-dosage subgroup. Since the predicted subgroups are constructed symmetrically using out-of-sample prediction

for both the intervention and the control groups based on pre-randomization baseline characteristics, the original experiment's integrity remains intact, and the effects on each of the predicted subgroups are genuine experimental outcomes, unaffected by any selection bias or external influences (Moulton et al., 2014; Moulton et al., 2018). We can interpret the effects on these predicted subgroups as the effects of the playgroup intervention on those with a set of characteristics associated with a given dosage level. In other words, the impacts on the predicted high-dosage subgroup represent the impact of playgroups on those most likely to experience a high-dosage, for example. For each predicted subgroup we used the following model:

$$Outcome_{jk} = \beta_0 + \beta_1(Treat)_{jk} + \beta_2(X)_{jk} + \beta_4(M)_l + (\varepsilon_{jk}) \quad (2.2)$$

Where

jk are subscripts refer to child (or caregiver or family), and district respectively;

Outcome is the child-level outcome;

Treat is a child-level, dichotomous variable set equal to 1 if the child was in the intervention group and to 0 if the child was in the control group;

X is a vector of child, caregiver or family-level characteristics (child: age, gender; caregiver: gender, employment status, educational level, cohabitation status),

M is a vector of four dichotomous variables indicating which of 5 districts the playgroup was located; and

ε is a child-level random error term.

β_0 is the estimate of the impacts of playgroups on the examined outcome.

For all analyses, we pooled data across the five districts and used fixed effects for districts because: 1) districts are very diverse and were not sampled randomly; 2) fixed effects help eliminate bias by controlling for all observed and unobserved effects at the district “level” of analysis. Including covariates in impact models is recommended practice in the analysis of randomized trials to increase precision of the impact estimates (Bloom et al., 2007). Regarding missing data, our analysis sample used only cases with data on outcomes (von Hippel, 2007). An OLS regression model was used for both continuous outcomes and binary outcomes (linear probability model).

Despite the tendency to only concentrate on the intervention group, where playgroup-induced changes are known, as Moulton and colleagues (2014), we use the control group as well, identifying the would-be-high-dosage counterparts to the intervention group's likely-high-dosage subset in order to use the experimental design to get us closer to being able to draw

causal conclusions about the relationship between playgroups and outcomes for children and families.

In the Results section, for each predictive subgroup, we report the adjusted mean of the outcome for control group families, the estimated mean intervention–control difference in outcomes, the standard error of the adjusted difference and the sample size. No estimates for district dummies were included in the reporting for confidentiality reasons. Data were analyzed in Stata (Version 13).

2.4. Results

Tables 2.9., 2.10., and 2.11. present ASPES regression-adjusted estimates of the playgroups intervention impacts on home environment and caregiving practices, children’s cognitive development, and children’s temperament and behavior outcomes, respectively, controlling for child age and gender; caregiver age, gender, employment status, educational level, cohabitation status. All impact estimates are for the predicted subgroup families and children. Within each table, impact estimates are presented separately for predicted high and low-dosage subgroups.

Table 2.9. presents estimated impacts of the playgroup intervention on home environment and caregiving practices. Although we find no evidence of significantly higher levels of home environment and caregiving practices for the predicted high-dosage subgroup, we do find evidence that parental acceptance to deal with less adequate behaviors of children was significantly lower for the predicted low-dosage subgroup, compared to their would-be-low-dosage counterparts in the control group. In specific, the predictive low-dosage playgroup caregivers were 8.16 points lower in Acceptance relative to their control-group counterparts.

Table 2.9. Impact of playgroups intervention on predicted subgroups: Home environment and caregiving practices.

	<i>Predicted high-dosage subgroup</i>				<i>Predicted low-dosage subgroup</i>			
	Adjusted Mean for high- dosage control families	Impact of high- dosage subgroup	Standard error of impact on high- dosage subgroup	n	Adjusted Mean for low- dosage control families	Impact of low- dosage subgroup	Standard error of impact on low- dosage subgroup	n
Responsiveness	44.02	-.15	2.04	130	42.28	.45	2.93	98
Acceptance	51.45	-1.43	2.89	128	58.37	-8.16*	3.38	99
Involvement under 24 months	57.34	7.03	7.14	50	^a	4.16	8.59	43
Academic stimulation above 24 months	65.01	8.62	5.89	84	58.15	7.39	8.06	57

Note. OLS model used for all reported impact estimates. All regressions include district fixed effects and covariates. High-dosage defined as having attended 25% or more playgroup sessions.

~ p<.10, * p<.05, ** p<.01, *** p<.001.

^a Not estimable.

Table 2.10. presents estimated impacts of the playgroup intervention on child cognitive development. Results show significantly higher scores on hearing and language for playgroup children of predictive high-dosage group relative to their would-be-high-dosage counterparts in the control group. In specific, the predictive high-dosage playgroup children were 3.42 points higher in hearing and language relative to their control-group counterparts. The estimates in Table 2.10. also indicate significantly higher levels of children's performance for those in the predicted low-dosage subgroup compared to their would-be-low-dosage counterparts in the control group. In specific, the predictive low-dosage playgroup children were 2.48 points higher in performance relative to their control counterparts.

Table 2.10. Impact of playgroups intervention on predicted subgroups: Child cognitive development.

	<i>Predicted high-dosage subgroup</i>				<i>Predicted low-dosage subgroup</i>			
	Adjusted Mean for high- dosage control families	Impact of high- dosage subgroup	Standard error of impact on high- dosage subgroup	n	Adjusted Mean for low-dosage control families	Impact of low- dosage subgroup	Standard error of impact on low- dosage subgroup	n
Hearing and Language	51.30	3.42*	1.38	119	52.44	-.45	1.52	87
Performance	52.08	1.48	.94	125	51.26	2.68*	1.27	96
Practical Reasoning	2.70	-.14	1.17	69	^a	-.18	.99	51

Note. OLS model used for all reported impact estimates. All regressions include district fixed effects and covariates. High-dosage defined as having attended 25% or more playgroup sessions.

~ p<.10, * p<.05, ** p<.01, *** p<.001.

^a Not estimable.

Table 2.11. presents estimated estimates of the playgroup intervention on child temperament and behavior. Although we find no evidence of significantly higher levels of positive child temperament and behavior outcomes for the predicted high-dosage subgroup, we do find evidence (at trend level) of significantly higher levels of children's negative affect, as measured by caregivers, for the predicted low-dosage subgroup, when compared to their would-be-low-dosage counterparts in the control group. In specific, the predictive low-dosage playgroup children are 0.35 points higher in Negative Affect relative to their control-group counterparts.

Table 2.11. Impact of playgroups intervention on predicted subgroups: Child temperament and behavior.

	<i>Predicted high-dosage subgroup</i>				<i>Predicted low-dosage subgroup</i>			
	Adjusted	Impact	Standard	<i>n</i>	Adjusted	Impact	Standard	<i>n</i>
	Mean	of high-	error of		Mean	of low to	error of	
	for high-	dosage	impact		for low-	moderate	impact	
	dosage	subgroup	on high-		dosage	dosage	on low to	
	control		dosage		control	subgroup	moderate	
	families		subgroup		families		dosage	
							subgroup	
Negative affect	3.34	-.05	.16	111	3.14	.35~	.20	87
Effortful control	4.95	.01	.14	111	4.94	-.01	.18	87

Note. OLS model used for all reported impact estimates. All regressions include district fixed effects and covariates. High dosage defined as having attended 25% or more playgroup sessions.

~ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

2.5. Discussion

This study aimed to estimate the relative effects of varying levels of a playgroup intervention dosage on home environment and caregiving practices, and on children's cognitive development, temperament and behavior. By using the ASPES method (Peck, 2013), we were able to create experimentally valid subgroups defined by attendance on playgroups (predicted high and low subgroups) and then estimate playgroup effects on those predicted to attend more/fewer playgroup sessions, in comparison with the control group.

We found that a high-dosage of playgroups improved children's hearing and language skills, when compared to their would-be-high-dosage counterparts in the control group. First and foremost, this result is consistent with extant literature from Australian studies indicating that playgroup participation has beneficial outcomes in children, including social and emotional, language, cognitive and communication skills and competence (Hancock et al., 2012; Sincovich et al., 2020; Williams et al., 2020). Playgroups provide caregivers and children with an opportunity to engage in play, have enjoyable experiences, and learn together. As primary sources of social stimulation for children, caregivers play a crucial role in shaping their children's language and communication development (Hart & Risley, 2003). Therefore,

caregivers' involvement in playgroups seems to significantly impact their children's developmental outcome in language. We also know that children learn through play (Ginsburg, 2007), and so, spending more time in playgroups, experiencing early learning activities and playing with others, in partnership with their caregivers may have been a powerful center of learning for the children.

Second, in line with previous findings on playgroup dosage from US studies (Bekar et al., 2016; Fabrizi et al., 2016), a higher attendance/dosage on playgroups seems to be associated with better outcomes for children. The experimental methodology of this study and the fact that we had dosage data that represented all families and children, gives more strength to this result. Additionally, to our knowledge, this is the first experimental study on playgroup dosage.

We also found that a low-dosage of playgroups improved children's developing abilities to reason through manual and visuospatial problems, including speed of working and precision, when compared to their would-be-low-dosage counterparts in the control group. This is a hopeful and somewhat surprising result, given the extant literature on ECEC dosage demonstrating that greater attendance is better and will result in increased positive outcomes, such as academic and behavioral outcomes (Ansari & Purtell, 2018; Ehrlich et al., 2018; Shah et al., 2017; Xue et al., 2016).

To unpack this result, one needs to consider the characteristics of families and children maintaining a pattern of low or irregular attendance at playgroup services. Our data demonstrated that predicted low-dosage families tend to be younger, more likely to be unemployed and have lower levels of education, as well as an income below the minimal wage. This finding seems to indicate that, although some groups of families are likely to attend playgroups in very small dosages (few then 30 playgroup biweekly sessions), even a low playgroup dosage might play a significant role in the development of children from a socioeconomically disadvantaged background. In this way, this finding is aligned with the international literature demonstrating that some early childhood education services, including playgroups, may have a greater positive influence on children from a socioeconomically disadvantaged background relative to children from more advantaged backgrounds (Deadman & McKenzie, 2020; Elango et al., 2015; Hancock et al., 2012).

We also found evidence of unfavorable impacts of playgroups on children's temperament and behavior. Our study shows that children experiencing low-dosage of playgroups were reported to present higher negative affect, i.e., were reported to be less capable to inhibit poor behavior and to regulate their behavior and emotions compared to their would-be-low-dosage counterparts in the control group. This effect was observed only for behavior reported by the

caregivers. Additionally, families experiencing low-dosage of playgroups reported to have less acceptance of their children behavior compared to their would-be-low-dosage counterparts in the control group.

On the one hand, it is possible that playgroup attendance in some way increased these behaviors in children and/or decreased the caregiver's ability to deal with less adequate behaviors – decreased acceptance. If so, playgroups interventions may need to provide caregivers with more or/and continued parenting and social support, particularly in order to deal with somewhat more disrupting behaviors. It is possible, by attending playgroups, to give caregivers opportunities to observe other caregivers and/or a facilitator modelling good parenting practices, and good parenting is predictive of resilience in children (Brennan et al., 2003).

On the other hand, for many families, this was the first time that they were in a group with other families and children, on a regular basis. Being in a group and seeing their child behaving poorer than other children, may have decreased the caregiver's tolerance and acceptance of their children behavior. The decreased of parental competence after a 6-week playgroup intervention was also found in an Australian quasi-experimental study by Fabrizi and Hubble (2017) with children with established delays. Nevertheless, the chance to engage in positive parenting within real-life situations with the presence of a facilitator has been described as beneficial (Dunn et al., 2012).

Looking back to the initial experimental impact estimates of the Playgroups for Inclusion project, we observed that the impacts of playgroups in the outcomes of interest on these likely high-dosage families and children were larger in magnitude than intention-to-treat impact estimates reported in the prior study (Barata et al., 2017). Furthermore, while the prior study found little to no evidence that playgroups affected child language outcomes, the estimated impacts on the predicted high-dosage subgroup indicate that playgroup children were 3.42 points higher in language relative to their control-group counterparts. This finding exalts the importance of considering the “black box” mechanisms, such dosage, in ECEC and particularly in playgroups. Failing to carefully consider dosage both in research and practice, prevents us for accurately assess the extent to which families and children received an intervention, or fully understand the most effective delivery mechanisms for that intervention, and determining its precise value. Hence, understanding dosage is essential to advancing research, practice, and policy in the field of early childhood care and education (Wasik & Snell, 2019).

2.5.1. Implications for practice and policy

In this study, we found that high playgroup attendance was related to the development of children's language. This is the first experimental study we are aware of that shows the effectiveness of playgroups on improving children's language abilities, while maintaining an universal approach to the provision of this service. Previous evidence has almost entirely been focused on interventions that target specific families and from a socioeconomically disadvantaged background or implement very specific interventions. Given our evidence, playgroups seem to be an important and relatively inexpensive intervention that can help support learning and development in the early years before children enter school.

For practitioners, the question that follows is “how much is enough?” Our work, combined with the previous implementation study (Barata et al., 2017), seems to indicate that an “optimal” playgroup attendance can be determined at approximately 30 playgroup sessions or about 3 months and a half of biweekly session, while still guaranteeing impacts for low and high attendees, depending on family characteristics.

Our findings demonstrate that gaps in playgroup attendance between children from advantaged backgrounds and children from disadvantaged backgrounds are significant, and as we demonstrate that playgroups have a positive impact on children's development, then programs and policies aimed at increasing playgroup attendance among families from a socioeconomically disadvantaged background may be one mechanism to help reduce socioeconomic inequalities in child development. Given that playgroups are a low-cost informal ECEC that has been studied for decades with proved beneficial outcomes for families and children, we acknowledge that playgroups could become universal for all families and children, maximizing but not targeting the involvement of families from disadvantaged backgrounds, to reduce inequalities and place the children in a good/better developmental pathway.

2.5.2. Limitations and future directions for research

First, this study emphasizes the importance of predicted subgroup outcomes, as they are established through a rigorous experimental comparison between experimental and control-group families and children identified by a combination of baseline characteristics—which means that the impact estimate is unbiased (Moulton et al., 2014). As the study by Moulton and colleagues (2014), we preserve the internal validity inherent in experimental designs, at the cost of diminished external validity. Although the estimate maintains internal validity, its capacity to accurately represent the subgroups of actual interest (i.e., families and children who were

actually in the high- and low-dosage subgroups, as opposed to families and children predicted to be in the respective subgroups) is constrained by the predictive power of the initial phase of the analysis. We recognize that our capacity to predict subgroup membership may be imperfect, while it is better than chance at identifying those families and children who attended to more playgroup sessions. This suggests that these subgroup impact estimates should be approached with caution. Overall, our findings respond to concerns that our comprehension of playgroups would be different when analyzed from a dosage perspective.

Second, the internal consistency for some of the subscales for the Home Environment and caregiving practices and Child temperament and behavior were low (Cronbach alpha below .60; Cronbach, 1951; Maroco and Garcia-Marques, 2006). This may be due to social desirability bias, as both scales include self-report (HOME includes items that are interview based). As so, the unfavorable effect of playgroups on the caregiving acceptance of children poor behavior (acceptance subscale – HOME) and the lack of significant effects on the other subscales with low alphas must be interpreted with caution. In the future, randomization trials should focus on using a smaller number of instruments to measure impact that rely mostly in standardized measures of impact, or if interview-based, should account for social desirability.

Third, there may be additional unmeasured confounders of the association between playgroup dosage and outcomes for families and children that we did not consider. Parenting styles might play a significant role in shaping a child's experience in a playgroup, thus influencing the potential impact of playgroups on children's outcomes (Sincovich et al., 2020). It is possible that caregivers who have a higher capacity to support their children's development are more likely to attend playgroups regularly. On the other hand, it could also be the case that caregivers who feel a need for support and social connection are more likely to attend playgroups more frequently. Consequently, the strength of the relationship between playgroups and children's development could be either overestimated or underestimated due to unaccounted factors such as parenting styles, knowledge, and parental coping skills. Recent research exploring the impacts of parenting style on early childhood learning in China, revealed that an authoritative parenting style is positively associated with learning outcomes and that low parental self-efficacy was linked to coercive or harsh parenting as well as a proclivity to give up easily when faced with parental difficulties (Kong & Yasmin, 2022). As such, it is suggested that further work seek to include additional information regarding caregivers' role in and influence on the relationship between playgroup attendance and child development.

Finally, education policymakers are athirst to know which specific parts of an intervention are responsible for producing the desired outcomes. Further, policymakers are increasingly

valuing evidence-based programs and perceive randomized assignments to achieve the necessary evidence for programs. However, conventional analyses of experimental evaluations often yield only general estimate of the average effect that can be expected from the treatment, while a more comprehensive understanding of the mechanisms at play within the “black box” is sometimes necessary. We suggest the continued support for the use of experiments to evaluate programs that may lead to new public policies, while also expanding the range of questions asked of experimental data. In this context, the ASPES method employed in this study offers a promising approach to answering crucial “What works?” questions regarding policy effectiveness, drawing upon the strengths of the experimental design as its foundation. Given the unlikelihood of educational-policy experimentation diminishing in the future, this approach offers new opportunities to gather valuable insights from such investments.

Assessing playgroup quality: Development and validation of the playgroup environment rating scale⁷

3.1. Abstract

Playgroups are community-based services that bring together young children and their caregivers for the purpose of play and social activities. Preliminary evidence shows that playgroup impacts may be dependent on the quality of the playgroup. However, to date, there is no reliable and valid measure of playgroup quality.

In this paper we describe the development and validation of the Playgroup Environment Rating Scale (PERS), a standardized observation measure designed to assess the quality of playgroups. PERS builds on traditional measures used to evaluate the quality of formal settings of early childhood education and care, while proposing to assess dimensions of quality specific to the nature of playgroups, namely complex interactions between several types of participants. After developing and testing the observation measure on 24 playgroup videos, we analyzed the psychometric properties.

Results showed that the PERS had good interrater reliability, was internally consistent and shows a good preliminary factor structure. Tests for convergent and criterion-related validity also presented promising results.

The process of design guaranteed that the PERS can be applied to different contexts of playgroups and may also be useful for informing service planning and practice. Further national and international validation will help replicate the validity of the scale.

Keywords: playgroups; validity; reliability; quality assessment; process quality; early childhood education and care.

⁷ This chapter is based on an article published in *Frontiers in Education*: Russo, V., Barata, M. C., Alexandre, J., Leitão, C., & de Sousa, B. (2022). Development and Validation of a Measure of Quality in Playgroups: Playgroups Environment Rating Scale. *Frontiers in Education*. 7, 1-14. <https://doi.org/10.3389/feduc.2022.876367>

3.2. Introduction

Playgroups are community-based groups that bring together young children (prior to school age) and their parents or caregivers for the purpose of play and social activities (Dadich & Spooner, 2008). Playgroups generally meet in a semiweekly schedule for sessions of two hours, during the school year, in diverse settings such as community spaces, public services or at the caregivers' home. Playgroups sessions are generally centered in the caregiver-child interaction and are low-cost or free of cost (Williams et al., 2015).

In Portugal, playgroups were implemented at a national level in the pilot project Playgroups for Inclusion. This project was targeted to families with children up to 4 years old, not participating in any of the currently available Early Childhood Education and Care (ECEC) services. Recruitment was focused on families belonging to minority groups and families whose caregivers were unemployed and underemployed (Barata et al., 2017).

Playgroups for Inclusion were designed as supported playgroups with paid and continuously trained facilitators that provided semiweekly sessions during 10 months, and were supervised by a hired early childhood educator. The role of the supervisors was to support the facilitators in their work with the families and children, and to promote a time for reflection with each group of facilitators (Freitas-Luís et al., 2017). Activities included music and singing, imaginative, outdoor and free play, art and craft activities, and were designed with the purpose of creating opportunities to learn, socialize, develop and increase skills, while aiming to meet the needs and interests of the participants, in a climate of interaction, sharing and cooperation with peers.

The Playgroups for Inclusion project included an experimental study and a study of program implementation. The study of program implementation aimed to describe playgroup development over 10 months, examining the nature and extent of implementation in key areas such as quality of playgroups (Barata et al., 2017).

3.2.1. Assessing quality in playgroups

Playgroups are implemented in several countries (e.g., Italy, German, UK, Australia) and are very important in the family support gap between maternity services and children's school entry (Dadich & Spooner, 2008). For example, in England, over 6% of preschool children up to 4 years participate in playgroups (Department for Education, 2018).

Research evidence about playgroups provides indication that such services improve a range of outcomes for children, such as language, cognition, behavioral skills and on children's

developing ability to reason through manual and visuospatial problems, including speed of working and precision (Deutscher et al., 2006, Page et al., 2022).

A growing body of research suggests that the magnitude of the benefits for children will depend on the level of quality of ECEC services, and that low-quality ECEC can be associated with no benefits or even with detrimental effects on children's development and learning (Britto et al., 2011; Howes et al., 2008). This evidence is especially strong in the case of children from disadvantaged families (Garces et al., 2002; Gormley et al., 2005) and from contexts of war and displacement (Wuermli et al., 2021). It is therefore essential that the quality of all ECEC services is monitored with reliable and valid instruments, including instruments to assess playgroup quality.

Quality can be seen as encompassing all the features of children's environments and experiences that are assumed to benefit their well-being (Litjens & Makowiecki, 2014). Definitions of ECEC quality often distinguish between structural characteristics and process features (for a review see Slot, 2018).

Structural characteristics are conceptualized as more distal indicators of ECEC quality, such as child-staff ratio, group size and staff training or education (Barros et al., 2016; Howes et al., 2008; Slot et al., 2015; Thomason & La Paro, 2009). Structural quality has been perceived as providing the preconditions for process quality (Cryer et al., 1999; Melhuish & Gardiner, 2019).

Process quality concerns the more proximal processes of children's everyday experience and involves the social, emotional and physical aspects of their interactions with staff and other children while being involved in play, activities or routines (Anders, 2015; Barros et al., 2016; Ghazvini & Mullis, 2010; Howes et al., 2008; Slot et al., 2015). Process quality has been seen as the primary driver of children's development and learning through ECEC (Howes et al., 2008; Mashburn et al., 2008; Weiland et al., 2013; OECD, 2018). Several studies with preschool children have found that sensitive, well-organized, and cognitively stimulating interactions foster children's development in domains such as language, mathematics, self-regulation and reduction of behavior problems (Howes et al., 2008; Mashburn et al., 2008; Weiland et al., 2013; OECD, 2018).

In addition to interactions, one other core domain of process quality has been identified in a robust study for infants and toddlers: use of space and materials (Barros et al., 2016). This domain describes infant interactions with materials and within activities that are intrinsically linked to caregivers' ongoing decisions and actions. Indicators that assess the quality of the

experiences that infants have with space and materials have been linked with learning and development (Berti et al., 2019; Helmerhorst et al., 2014; Vandell, 2004).

The Environment Rating Scales (ERS) measures, for example, the Infant Toddler Environmental Rating Scale-Revised (ITERS-R; Harms et al., 2006) or the Early Childhood Environmental Rating Scale-Revised (ECERS-R; Harms et al., 1998), are the most commonly used observational instruments to evaluate the process quality in formal ECEC (Slot, 2018). These measures include a wide range of dimensions of environmental quality, such as furnishing and materials, the provision of variety of activities, aspects of the interactions and program structure.

Some studies also use the ERS to assess quality in playgroups. The ERS, while valid and useful for assessing the quality in formal daycare, present severe limitations for assessing quality in playgroups. For example, playgroups usually take place in spaces available for other purposes (e.g., libraries) and so some indicators of quality by the ERS may be inappropriate (e.g., nap time, personal care; see Lera et al., 1996; Melhuish, 1994).

The ERS also do not consider parental involvement and participation in sessions, which are central to playgroup dynamics (Statham & Brophy, 1992). The multiplicity of roles that occur in a playgroup imply a careful look to all ongoing interactions, including between facilitators and children, facilitators and caregivers, among caregivers, and among children. The same limitations apply to measures used in formal settings that were slightly adapted to playgroups, such as Preschool Program Quality Assessment of the program High/Scope (PQA, High/Scope Educational Research Foundation, 2001, see French, 2005) and the Adult Style Observation Scale (ASOS, Laevers, 2000, see Ramsden, 1997). These limitations demonstrate the need to develop an observational scale that considers the specificities of playgroup environment and interactions.

Recently, Commerford and Hunter (2017) identified core components of quality that are specific to playgroups. These include space, activities and play experiences, interactions taking place and the presence of skilled facilitators to engage families.

The space of the playgroup needs to be welcoming and warm, easily accessed, adequately resourced, and adaptive to the needs of different cultural groups (Williams et al., 2015). The group size is also very important. While a few studies have recommended group sizes of 4-12 families or 6-8 for playgroups (McArthur & Butler, 2012; Social Entrepreneurs, 2011), the ideal group size needs to allow the caregiver and child to receive adequate attention, where problems can be identified more readily and a familiar and safe group environment can be fostered (Salinger, 2009).

The activities and play experiences for the families and children need to be fun, support child development, and allow caregivers to participate and further develop their own skills (Commerford & Hunter, 2017). Play provides children with many opportunities to learn (Department of Education, Employment and Workplace Relations, 2009) and is associated with the development of language and literacy, sociability and mathematical ability in children (Hancock et al., 2012). Also, the benefits of play can be introduced to the caregivers who, through their diverse or disadvantaged backgrounds, have little personal experiences of play (Commerford & Hunter, 2017).

Playgroup quality assessments also must provide an indication of the interactions taking place. Research demonstrates that one of the main reasons caregivers join playgroups is to develop a sense of belonging (Harman et al., 2014), develop friendships and finding emotional and social support (Gibson et al., 2015; Hancock et al., 2015). Also, young children learn through relationships (OECD, 2018), therefore it is essential that warm, welcoming and inclusive interactions that facilitate positive relationships be present in playgroups. Finally, facilitators need to have the training, knowledge, and skills to provide the support needed.

3.2.2. Designing the Playgroup Environment Rating Scale

The designing of the Playgroup Environment Rating Scale (PERS) was based on the core domains of process quality for infants and toddlers identified by Barros et al. (2016) and the core components of quality in playgroups identified by Commerford and Hunter (2017). The PERS focused on the three main goals for the playgroups: to promote children and caregiver's natural learning through play; to promote wellbeing and socialization environments between all participants; and to ensure a space and time for exploration, discovery, sharing and positive interactions between adult(s) and children, among adults and among children (for a detailed description see Freitas-Luís et al., 2017b).

We included indicators specific to the nature of playgroups (Commerford & Hunter, 2017), namely the playgroup routine, the presence of different adults interacting with the child and with each other, and indicators related with the contact with diversity because of the importance of playgroups to the inclusion of culturally and linguistically diverse families (Strange et al., 2014).

To maximize the alignment between the stipulated goals for the playgroups and the knowledge of existing measures, we decided that the PERS should follow the structure of the ERS for two reasons. First, the ERS seemed better suited to match stipulated goals, namely the focus on play-based learning. Second, the ERS were found to be the most commonly used

observational measures in the literature (Vermeer et al., 2016) and in 33% of the studies that assess quality in playgroups, making them easier to adapt and more relevant to the PERS target audience.

Therefore, the PERS was conceptualized to incorporate four main dimensions: Space and materials, Activities and routines, Contact with diversity, and Climate and interactions. These four dimensions were broken down into subdimensions which were then operationalized into smaller observable indicators (see Table 3.1.).

The goal of the present study is to examine the psychometric properties of a new measure to assess the quality of playgroups. The five specific aims are: (1) To test the reliability of the PERS, analyzing the internal consistency of the scale and the interrater reliability; (2) to assess the scale sensitivity to changes in quality over the 10 months of implementation; (3) to explore the factor structure of the PERS; (4) to test the convergent validity with the Adult Style Observation Schedule (ASOS; Laevers, 2015) and (5) to test the criterion-related validity of the PERS with structural characteristics of quality (concurrent validity) and with the outcomes for children that participated in playgroups (predictive validity). We hypothesized that significantly higher playgroup quality would be observed in playgroups with fewer dyads (1 dyad of a caregiver and one child), rather than more and facilitators with more years of experience, rather than fewer. Finally, we also hypothesized higher playgroup quality would be predictive of significantly higher outcomes in children's cognitive development.

Table 3.1. PERS dimensions and items.

<i>PERS dimensions (items)</i>	<i>Description</i>
<i>Space and Materials (Indoor Space, Space organization, Materials)</i>	Assesses whether the space complied with the minimum requirements of security, hygiene and accessibility; whether the playgroup space can be easily arranged in order to accommodate children and adults and playgroup activities and the type and quality of the materials that is used during the sessions.
<i>2. Activities and Routines (General routine, Activities of the session, Free play)</i>	Assesses the associated structure of the playgroups in practice, i. e. greetings and farewells, transitions. Whether the playgroup sessions take into account facilitators' proposals of activities that meet the needs and interests of the participants and the privilege of free exploitation of space and materials by the participating families.
<i>3. Contact with diversity (Diversity of Dialogues, Diversity of Practices, Diversity of materials)</i>	Assesses the respect and introduction of cultural elements from different countries in sessions and planning of individual needs. Whether the playgroups session include activities and materials that reflect the specific cultures of the playgroup families.
<i>4. Climate and interactions (General climate, Interaction children, Interaction facilitators and children, Interaction facilitators and caregivers, Interaction caregivers and their children, Interaction caregivers and other children, Interaction caregivers, Interaction supervisors and caregivers, Interaction supervisors and facilitators)</i>	Assesses the emotional connection between the participating families, children and facilitators. Interactions encompass demonstration of care, interest and warmth between all the participants in the playgroups. Whether there are stimulating dialogues, sensibility and given autonomy to the children, play and active participation in the sessions and trust, proximity and collaboration between adults.

3.3. Method

3.3.1. Development of the Playgroup Environment Rating Scale

Following the Spector (1992) guide for scale construction, the development of the Playgroup Environment Rating Scale (PERS) began with the:

(1) *Exploratory phase*: in which the research team conducted a literature review of the playgroups literature, focusing on existing ECEC quality measures, other observational measures, and grey literature on playgroup implementation (e.g., Berthelsen et al., 2012; McArthur & Butler, 2012). The review of the literature on existing program quality measures highlighted the use of the ERS (e.g., ECERS-R, Harms et al., 1998) for playgroup quality evaluation, as well as other observational measures that were adapted to be applied to playgroups. These other measures were in general more focused on the quality of the interactions, namely the Adult Style Observation Schedule (ASOS, Laevers, 2000, see Ramsden, 1997) and the Quality Assessment from the program High/Scope (PQA, High/Scope Educational Research Foundation, 2001, see French, 2005). The Quality Learning Instrument (QLI, Walsh, 2000) had also been used to assess the quality of the learning environment at playgroups (Cunningham et al., 2004).

An examination of the training and certification procedures for the available measures helped us decide the scoring procedures of the preliminary measure. The team examined two options: to score the items one time during the two-hour sessions, similar to the ERS; or to score two cycles of 20 session minutes with a break of 20 minutes between the cycles, similar to the scoring of the Classroom Assessment Scoring System (CLASS, Pianta et al., 2015). While the first option seemed more feasible for the application in an informal community context, the second option seemed most favorable to getting a global picture of the playgroup quality. It also allowed us to test and establish measure stability across two observations of the same playgroup in the same day (this procedure was later simplified in the final version of PERS).

To match the ERS, the PERS was designed to include a sheet to record basic characterization of the playgroup space, and a short (about 30 minute) discussion with the facilitator to ask clarifying questions about the observation and give facilitators the opportunity to share information about playgroup practice.

(2) *Conceptualization*: in which we specified the domains of process quality that would compose the indicators of quality of the PERS. We decided to include indicators that assess the quality of the experiences that infants have with space and materials because of its reported importance for learning and development (Helmerhorst et al., 2014; Vandell, 2004). We also include indicators that were specific to the nature of playgroups (Commerford & Hunter, 2017), namely the playgroup routine, the presence of different adults interacting with the child and with each other, and indicators related with the contact with diversity because of its importance in the inclusion of culturally and linguistically diverse families (Strange et al., 2014). The PERS

was conceptualized to incorporate four main dimensions: Space and materials, Activities and routines, Contact with diversity, and Climate and interactions.

(3) *Item generation*: in which the conceptualized dimensions of the PERS were operationalized into 18 subdimensions by breaking them down into smaller observable indicators, similar to the structure of the ERS scales (Harms et al., 2006). The first indicators that we created for one item guided the development of subsequent indicators for the same item. For example, the item Interaction between Facilitators and Children included one indicator on the description for “inadequate” quality assessing if the facilitators promoted or not the autonomy of the children. On the description for “minimal”, “good” and “excellent” quality, this indicator became more specific, measuring how many times the facilitator promoted the autonomy of children and how.

(4) *Expert review*: in which five early childhood educators and 10 trained facilitators of playgroups made suggestions for improvements based on their practice and experience. Experts suggested the addition of a new item on the dimension Space and Materials, that was the Space Organization, as well as additional indicators based on their practices and experience. We agreed to add this item because playgroups are frequently installed in spaces provided by local public or private organizations, and the quality of the playgroup depends on the potential of the space to be organized to accommodate children, adults and playgroup activities.

Experts also requested further clarification of concepts such as “accessing materials”, “facilitator’s initiative” and “free play”, which were implemented in clarification notes where these concepts first appeared. Regarding the structure of the measure, experts made specific comments about the allocation of certain indicators to expected levels of quality. For example, in the item “materials” an indicator that was first considered to be on the level “minimal” quality (“switch materials to provide variety”) was recommended to be changed to the level “good”.

(5) *Piloting*: in which we collected 24 playgroup video sessions that corresponded to 12 playgroups observed approximately 10 months apart. One researcher scored all videos using the preliminary version of the PERS. On average, the scoring of the PERS took three hours per playgroups video. Interrater reliability between the researcher and a reliability coder was carried out on a randomly selected sample constituted by 33% of the videos (i.e. 8 videos).

The pilot experience made us realize that the decision to score two cycles of 20 minutes with a break of 20 minutes between the cycles could artificially decrease or increase the level of quality attributed to the playgroup, depending on the cycles chosen. This scoring criterion was also complex, strenuous and time consuming. The change in the scoring criteria of the PERS made it even more similar to the scoring procedures of others ERS.

Results from the preliminary psychometric study of the properties of the PERS revealed that the subscale items were not very consistent, suggesting that the subscale items were not very related. Results also noted that independent coders trained in using the preliminary version of the PERS were not reliable in their ratings, suggesting that further clarification of the items and indicators could enhance interrater reliability. Such results determined a revision of the measure that was grounded in an in-depth expert review.

(5) *Final Review*: in which ten facilitators were interviewed as part of an in-depth expert review. The facilitators were asked about which quality characteristics they valued the most about playgroups and how. The examples of adequate and inadequate quality characteristics that facilitators gave helped us add more clarification notes and examples to all the items and indicators. The facilitators also mentioned the importance of two aspects of the quality of playgroups that we did not have included in the preliminary version of the PERS: the interaction between the facilitators and the diversity of materials. We decided to include these aspects on the PERS for the reasons followed. Regarding the first aspect, the interactions between facilitators have found to determine playgroup quality by modeling positive interactions between parents (Social Entrepreneurs, 2011). Regarding the second aspect, published research on the ECERS-E (ECERS-Extension, Sylva et al., 2003) supports the importance of the subscale “Diversity” for predictive validity of child outcomes (Sylvia et al., 2006), also playgroups have found to be important in the inclusion of culturally and linguistically diverse families (Strange et al., 2014).

Facilitators also highlighted the importance of playgroup supervision and the role of supervisors, an item which had been included in the PERS but does not apply to all playgroup models implemented outside of Portugal. The importance of a knowledgeable supervisor in playgroups has been reported to provide a sounding board and support for facilitators (Commerford & Hunter, 2017; Social Entrepreneurs, 2011). Supervisors provide opportunities to reflect, problem solve, and even role-play difficult situations and relationships that ultimately can improve the quality of playgroups. Therefore, we decided to maintain the items regarding the supervisors’ role with the option to code “not applicable”.

3.3.2. Design, participants, and procedure

This study used data from 13 (out of 25) randomly selected Playgroups for Inclusion, as well as data from the 103 families, 14 facilitators and five supervisors in these playgroups. The 13 playgroups were located across five districts of Portugal and were randomly selected (stratified

by district) because of logistic constraints. Selected families were assessed at pretest (N=103), and posttest (73%, N=75).

Data collection of children's development took place in August 2015, pre pandemic, and posttest took place one year after. The participation in both phases implied a home visit (two hours maximum) by one or two trained psychologists.

The mean age of the participating children at pretest was 16 months, ranging from 70 days to 46 months and 50% were younger than 16 months. The mean age of the caregivers at posttest was 35 years old, ranging from 15 to 68 years old ($SD = 11.13$), 63% have completed secondary education, and they were mostly mothers (85%). Approximately 86% of the households' income was above the minimum wage per employed adult and 74% of the households did not receive social welfare.

Data collection for quality evaluation of the playgroups took place one month after the beginning of playgroup implementation (December 2015, T1), and then one month before the proposed end (July 2016, T2). In the end, 24 playgroup video sessions were recorded. At T1, 39 (42%) families were present, and the number of dyads in each playgroup ranged from 1 to 5 ($M = 3.33$, $SD = 1.25$). At T2, 34 (41%) families were present, and the number of dyads in each playgroup ranged from 1 to 7 ($M = 3.25$, $SD = 2.00$). In total, 50 families participated (overlapping). Levels of attendance during the two rounds were a little below of the previous literature on playgroups (57%, Berthelsen et al., 2012).

The mean age of the participating children was 18 months, ranging from 1 to 37 months and 50% of them were younger than 16 months. The mean age of the caregivers was 37 years old, ranging from 15 to 68 years old ($SD = 12.46$), and they were mostly mothers (82%). The average professional experience of the facilitators that delivered the semiweekly sessions at T1 was three years ($M = 3.29$; $SD = 3.12$), all but one had at least one year of professional experience working with children and two had 10 years (maximum).

To establish interrater reliability for the PERS, two PhD students with previous experience in using classroom quality measures were trained over a two-day workshop. In the end, the coders completed a test using one playgroup video (excluded from the final sample), in which the mean interrater percent agreement was 82% based on the consensus scoring within one rating point. The two trained observers coded the 24 videos using the PERS. The observers were blind to the time of monitoring (T1 or T2).

To check the convergent validity of the PERS, the 24 playgroup videos were scored with other measure of process quality: Adult Style Observation Schedule (ASOS, Laevers, 2015).

Formal training and certification in the ASOS were provided to the main researcher and another observer by a certified trainer of ASOS.

Prior to data collection, the Portuguese Data Protection Authority approved all data collections procedures and the research team collected informed consents from all caregivers and legal representatives (when not the caregiver), facilitators and supervisors.

3.3.3. Measures

3.3.3.1. Griffiths Mental Development Scales (GMDS)

To measure children's development, we used the Portuguese version of Griffiths Mental Development Scales (GMDS; Griffiths, 1954; 0-2 years old: Huntley, 1996; 2-8 years old: Luiz et al., 2006). We applied only the following subscales: Language, Performance and Practical Reasoning.

GMDS subscale raw scores were computed by adding the total number of correct items. This computation followed the GMDS 0-2 years Manual (Huntley, 1996) but it was carried out for children of all ages in order to allow comparison of results across the two age groups. Table 3.2. presents the descriptive statistics for the subscales. The internal consistency of the GMDS subscales was excellent ($\alpha > .90$) for all the three subscales at T1 and T2 (Barata et al., 2017). In the present study, at T1 and T2 the internal consistency was excellent for the subscale language and performance ($\alpha > .90$) and good for the subscale practical reasoning ($\alpha \geq .80$).

Table 3.2. Griffiths Mental Development Scales (GMDS) scores at T1 and T2

Variables	N	Mean (SD)	Range	Skew	Kurt	Alpha
T1 Language	92	36.57 (17.69)	3-73	-.12	-.77	.98
T2 Language	62	51.74 (14.63)	24-78	.05	-.96	.97
T1 Performance	95	37.61 (17.55)	3-66	-.36	-.85	.98
T2 Performance	69	52.20 (11.25)	28-72	-.40	-.72	.96
T1 Practical Reasoning	22	4.14 (3.14)	0-12	-.83	.53	.80
T2 Practical Reasoning	32	7.78 (5.44)	0-25	.75	1.70	.89

Note. We did not compute a global reliability score because we did not use all the subscales in the GMDS.

3.3.3.2. Playgroup Environment Rating Scale (PERS)

The PERS included 18 items organized under four conceptually defined subscales: Space and Materials, Activities and Routines, Contact with Diversity and Climate and Interactions (Table 1). For each item, the observer responded to a series of yes/no indicators that were anchored on a 7-point item. Then the observer applied rules to the pattern of yes/no indicators to determine a score, which were labeled as inadequate (1), minimal (3), good (5), and excellent (7). Because the PERS was designed to be applicable to a range of playgroup practices (e.g., with or without exterior space, for older and younger children, facilitated playgroups and self-managed playgroups, with or without supervisor) some items and indicators may not be applicable in some contexts. In that case, these items and indicators were coded “Not applicable”.

The scoring of the PERS was based on the observation of one full playgroup session, backed up by information collected from facilitators whenever extra information was needed to score an item, and a form with basic characterization of the playgroup space.

3.3.3.3. Adult Style Observation Schedule (ASOS)

The ASOS (Laevers, 2015) assesses the quality of an adult’s interactions with a child. ASOS has three dimensions for the quality of interactions: stimulation, sensitivity and giving autonomy. The score of the ASOS was rated on a 7 point-scale, in which the values 1 and 2 corresponded to predominantly negative behaviors, the values 3, 4 and 5 corresponded to the neutrality, and the values 6 and 7 to predominantly positive behaviors.

ASOS is normally used in formal educational settings. In the context of playgroups, an older version of this scale (with 5 points) was successfully used with slight differences on the methodology (see Ramsden, 2007). We decided to use the updated version (Laevers, 2015) because the score criteria are similar to the PERS. ASOS coding involves observing each facilitator in two separated days in 4 periods of 10 minutes. Because this was not possible with our sample, adaptations to the ASOS coding methodology were discussed with and approved by the certified trainer in order to code 40 minutes of observation in total per facilitator. The mean weighted kappa between the two trained raters on 30% of the videos (7 videos) was moderate ($\kappa = .70$) (Fleiss et al., 2003).

Table 3.3. presents the descriptive statistics for the subscales and overall score of ASOS. The ASOS has demonstrated good internal consistency of the items in the three subscales (Van Heddegem et al., 2004). In the current study, the internal consistency was good for the subscale stimulation ($\alpha=.88$) and excellent for the subscale sensitivity ($\alpha=.98$) subscale autonomy ($\alpha=.91$) and overall score ($\alpha=.95$).

Table 3.3. Adult Style Observation Schedule Subscales and Overall score.

Variables	N	Mean (SD)	Range	Skew	Kurt	Alpha
ASOS Sensitivity	20	5.97 (.78)	3.94-7.00	-.90	.35	.94
ASOS Stimulation	20	5.24 (.84)	3.20-6.42	-.50	.70	.88
ASOS Autonomy	20	6.27 (.77)	3.53-7.00	-2.22	6.19	.91
ASOS Overall score	20	5.83 (.67)	3.74-6.63	-1.36	2.74	.95

3.3.4. Data analysis

To test the internal consistency of the PERS we calculated Cronbach's alpha for each of the subscales and the total scale. Two items of the PERS (Interaction between Supervisors and Caregivers and Interaction between Supervisors and Facilitators) scored "not applicable" in 80% of our sample, because the supervisors were not present in the sessions. Therefore, ratings on these items were not included in the analyses.

To assess the interrater reliability of the PERS we calculated the linear weighted kappa (Fleiss et al., 2003). The weighted kappa is commonly reported in other studies using the ITERS-R (see Barros et al., 2016; Barros & Aguiar 2010) or using other measures of preschool quality (ICP; Soukakou, 2012).

To test PERS sensitivity, we conducted a Wilcoxon's signed rank test to analyze whether there were differences between T1 and T2 at subscale level. Because only 12 playgroups were monitored at T1 and T2, we present results for 12 playgroups. Based on similar studies (e.g., Barros & Aguiar, 2010; Smith-Donald et al., 2007), we also presented correlations to test convergent and criterion-related validity analyses.

A preliminary exploratory factor analysis (EFA) was conducted to explore the factor structure of the PERS. Our data yield mean loadings of .83 for four factors accounting for 14 variables. According to Winter and colleagues (2009), our sample size of 24 is sufficient for factor recovery. Following Smith-Donald and colleagues (2007), we used principal component extraction for standardized version of the 16 items of the PERS. Standardization is recommended when dealing with variables that vary widely with respect to the standard deviation values of the raw data, which is the case (DiStefano et al., 2009). Resulting components were rotated obliquely using Direct Oblimin to allow correlation between factors. Cronbach's alpha was calculated for each emerging construct and provides an index of internal consistency based on the average of the items scores in the construct. We used IBM SPSS, Version 25.0 for the analyses.

3.4. Results

3.4.1. Reliability of the Playgroups Environment Rating Scale Revised (PERS)

3.4.1.1. Internal consistency and interrater reliability of the PERS

Table 3.4. shows Cronbach's alpha and correlations for PERS subscales and overall score. The internal consistency for the overall score and for the subscale Climate and Interactions was good ($\alpha = .81$ and $\alpha = .84$, respectively). The alphas for the subscale Space and Materials and Activities and Routines were questionable ($\alpha = .63$ and $\alpha = .67$) and for the subscale Contact with Diversity was unacceptable ($\alpha = .41$). Moderate to high correlations were found between the subscales and the overall score (ranged from .65 to .88), except for the subscale Space and Materials ($r = .32$).

Table 3.4. also presents the mean weighted kappa scores for each of the subscales and the overall score. Interrater exact percent agreement ranged from 35% to 100% ($M=64$, $SD=.20$) and interrater within one scale point percent agreement ranged from 61% to 100% ($M= 85$, $SD=.13$). Levels of interrater agreement within one scale point were considered good (Fleiss et al., 2003), and matched expectations from other common quality scales (Barros & Aguiar, 2010; Cadima et al., 2018).

Table 3.4. Cronbach's alpha, correlations for PERS subscales and overall score and Inter-rater agreement of the measure's dimensions and overall score.

	Number of items	Alpha	Correlations	Mean weighted kappa (κ) scores (N=8)
PERS Space and Materials	3	.67	.32	.77
PERS Activities and Routines	3	.63	.65**	.65
PERS Contact with diversity	3	.41	.65**	.76
PERS Climate and interactions	7	.84	.88**	.69
PERS Overall score	16	.81		.85

Note. For estimating Cronbach's coefficient alpha and Pearson's correlations, two items (item 16 and 17) were excluded, because these two items were "not applicable" for 80% of our sample.

* $p < .050$ ** $p < .010$

3.4.2. Sensitivity of the PERS

3.4.2.1. Descriptive statistics and overall score

Table 3.5. presents descriptive information for the items, subscales, and overall score. Overall mean results on PERS ranged from 4.09 to 6.52 ($M = 5.10$; $SD = .68$). Subscale means ranged from 3.63 to 6.15 with the lowest scoring subscale being Contact with Diversity, and the highest subscale average occurring in Space and Materials.

Mean results at the item level ranged from 2.21 to 6.80 with the lowest scoring items being Diversity of Materials (item 9), and the highest item averages occurring in Interaction between Supervisors and Facilitators (item 18). All items presented mean scores that indicated presence of minimal quality, except item 9. Five of the 18 items were scored between 1 and 7. Of the remaining 13 items, all presented minimal ratings (between 1 and 3), except for item 1 (Indoor Space), item 12 (Interaction between Facilitators and Children) and item 18, which scored respectively 6.00, 5.00, and 6.00 as minimums. All items presented maximum scores (between 6 and 7). Kurtosis and skewness values for item 1, 3, 12, 14 and 18 presented data skewed to the right and a little peaked, which reflected a concentration of scores on higher scale points.

Table 3.5. Descriptive statistics for the PERS items, subscales and overall score.

	Sample size	Mean	SD	Min-Max
<i>I. Space and materials</i>	24	6.15	.66	3.83- 6.83
1.Indoor Space	24	6.79	.51	6-7
2.Space organization	24	6.29	.99	3-7
3.Materials	24	5.38	.98	3-7
<i>II. Activities and routines</i>	24	5.27	1.07	2.17-6.67
4.General routine	24	4.43	1.38	1-7
5.Activities of the session	24	5.22	1.65	2-7
6.Free play	24	6.15	1.17	3-7
<i>III. Contact with diversity</i>	24	3.63	.93	1.83-5.67
7.Diversity of dialogues	24	3.54	1.51	1-7
8.Diversity of practices	24	5.13	1.36	1-7
9.Diversity of materials	24	2.21	1.22	1-6
<i>IV. Climate and interactions</i>	24	5.20	1.04	3.04-6.75
10.General climate	24	5.69	1.35	3-7
11.Interaction children	24	4.23	1.35	1-7
12.Interaction facilitators and children	24	6.73	.53	5-7
13.Interaction facilitators and caregivers	24	5	1.15	3-7
14.Interaction caregivers and their children	24	6.22	1.28	3-7
15.Interaction caregivers and other children	24	4.83	2.19	1-7
16.Interaction caregivers	24	3.69	1.47	1-6
17.Interaction supervisors and caregivers	5	3.80	1.92	2-7
18.Interaction supervisors and facilitators	5	6.80	.45	6-7
<i>Overall score</i>	24	5.10	.68	4.09-6.52

3.4.2.2. Sensitivity of the PERS to change over time

Figure 3.1. illustrates PERS scores at T1 and T2. PERS overall score at T1 was on average 4.90 indicating that the playgroups were at a moderately high level of quality in the beginning of the playgroup implementation. Averages of the subscales at T1 ranged from 4.83 to 5.92, except for Contact with Diversity that was lower ($M=3.43$; $SD=.94$). The subscale with the highest score was Space and Materials ($M=5.92$; $SD=.80$).

At T2, three subscales and overall score had higher averages than at T1, but differences over time were only significant for Space and Materials at the subscale level. The Wilcoxon's signed rank test indicated that the median T2 scores for this subscale were statistically significantly higher than the median T1 scores ($Z=-1,826$; $p=.048$). Effects sizes were equal to .088 at the subscale level and ranged from .215 to .811 at item level. This statistically significant difference reflected a higher score on the item Materials at trend level ($d= .811$; $p=.098$). The higher score at the subscale Activities and Routines reflected a statistically significant higher score on the item Free Play ($Z=-1,902$; $p=.035$) with effect size equal to .979. There were no other significant differences in median scores from T1 to T2 in the other subscales or items.

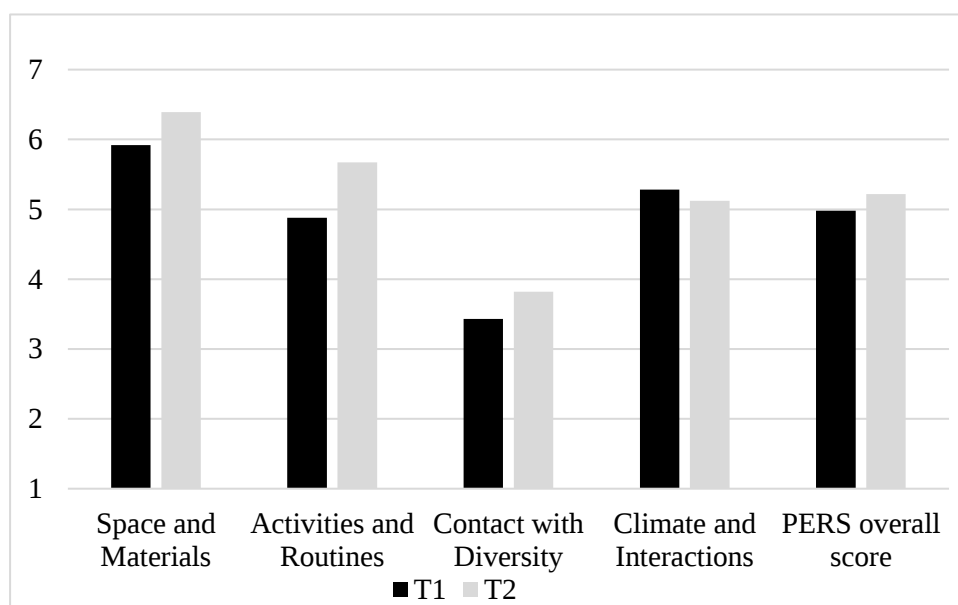


Figure 3.1. Mean scores for subscales and overall score of the PERS.

3.4.3. Validity of the PERS

3.4.3.1. Factor structure of the PERS

Factor analysis on the 16 items of the PERS indicated five components with eigenvalue > 1 (Kaiser rule) reflecting playgroup interactions, use of space and materials, interactions with children and two undefined components. However, the items Indoor Space, Diversity of Materials and Diversity of Dialogues loaded highly onto more than two components, and were thus discarded. Factor analysis was redone excluding these items and only including factor loadings above or equal to .32 (Tabachnick & Fidell, 2013).

The final structure consisted of four dimensions: Playgroup Interactions, Playgroup Experiences, Play-based Learning and Facilitator Practices and Interactions and explained 77.3% of the variation (Table 3.6.). In the final solution, the item Interaction between Facilitator and Children loaded well into more than one component. Cronbach's alpha if item deleted was calculated for these two components and the item was retained in the component where the alpha was less impaired. The reliability of the final constructs, as determined by Cronbach's alpha, yielded reasonable-to-excellent reliabilities. Most of the items contributed to the good reliability of the dimensions as can be seen from the corrected item-total correlations presented in Table 3.6. This was especially the case for the items in the Facilitator Practices and Interactions dimension. In this dimension, the obtained Cronbach's alpha was low, but all items showed reasonable correlations with the total score, which attested to the internal consistency of this dimension.

Table 3.6. Principal components factor analysis of the PERS, corrected item-total correlation, and internal reliability of the measure's dimensions.

Dimensions and items	Loadings	Corrected total correlation
<i>Playgroup Interactions (eigenvalue=4.24; $\alpha = .92$)</i>		
10.General Climate	.96	.92
16.Interaction caregivers	.93	.80
11.Interaction children	.90	.82
15.Interaction caregivers and other children	.90	.87
<i>Playgroup Experiences (eigenvalue =2.84; $\alpha = .75$)</i>		
14.Interaction caregivers and their children	.85	.58
5.Activities of the session	.79	.63
4.General Routine	.76	.54
<i>Play-based Learning (eigenvalue = 1.72; $\alpha = .77$)</i>		
6.Free play	.87	.70
2.Space organization	.82	.56
3.Materials	.79	.58
<i>Facilitator Practices and Interactions (eigenvalue =1.26; $\alpha = .62$)</i>		
12.Interaction facilitators and children	.60	.57
13.Interaction facilitators and caregivers	.89	.45
8.Diversity of practices	.68	.45

Note: Rotation Method: Oblimin Rotation with Kaiser normalization.

3.4.3.2. Convergent validity of the PERS

Convergent validity was examined by correlating the PERS dimensions (derived from the PCA) with the ASOS subscales and overall score. As shown in Table 3.7., scores on the Playgroup Experiences dimension were positively associated with the ASOS Stimulation subscale ($r=.62$, $p=.001$). Similar patterns of a high degree of correspondence were observed for the Facilitator Practices and Interactions dimension, where correlations were positively associated with the Stimulation subscale ($r=.40$, $p=.052$). No other relevant correlations for the convergent validity reached significance.

Table 3.7. Bivariate correlations between PERS dimensions with ASOS subscales and overall score.

	ASOS Sensitivity	ASOS Stimulation	ASOS Autonomy	ASOS Overall score
1. PERS Playgroup Interactions	.24	.15	.24	.25
2. PERS Playgroup Experiences	.03	.62**	-.14	.22
3. PERS Play-based Learning	-.16	.18	-.14	-.04
4. PERS Facilitators Practices and Interactions	.11	.40 [†]	.13	.26

[†] $p < .10$ * $p < .050$; ** $p < .010$

3.4.3.3. Criterion-related validity of the PERS

Concurrent validity was examined by correlating the PERS dimensions (derived from the PCA) with group size and facilitators' experience (measured in years). As shown in Table 3.8., scores on the Playgroup Interactions dimension were significantly and positively associated with the group size ($r = .61$, $p = .002$). We found no association between the PERS dimensions and facilitator's years of experience.

Predictive validity was examined by correlating the PERS dimensions (average of T1 and T2 scores) with the Griffith's subscale scores (average of T1 and T2 scores). As shown in Table 3.8. scores on the Play-based Learning dimension were significantly and positively associated with the Griffith's subscales of Language ($r = .28$, $p = .005$) and Practical Reasoning ($r = .50$, $p = .002$). No other relevant correlations for the predictive validity reached significance.

Table 3.8. Bivariate correlations for the criterion-related validity of PERS dimensions.

	Concurrent (N=24)	Predictive			
	Group Size	Facilitators years of experience (M)	Language ^a	Performance ^b	Practical Reasoning ^c
1. PERS Playgroup Interactions	.61**	.17	-.01	.03	.05
2. PERS Playgroup Experiences	.10	.18	-.09	-.01	-.10
3. PERS Play- based Learning	.04	-.07	.28**	.19	.50**
4. PERS Facilitators Practices and Interactions	-.11	-.05	.04	.02	-.10

Note: Four the predictive analysis we used the means of T1 and T2 of the PERS dimensions and Griffith's subscales.

^a (N=99). ^b (N=102). ^c (N=36).

* $p < .050$; ** $p < .01$

3.5. Discussion

The development of the PERS involved an interactive process following a classical guide for scale construction (Spector, 1992). The results of this process led to a measure that follows the structure of the ERS and was conceptualized to incorporate four main dimensions: Space and Materials, Activities and Routines, Contact with Diversity, and Climate and Interactions.

In the present study, we tested the validity of the PERS, namely the reliability, sensitivity, factor structure, convergent and criterion-related validity of the scale. Results showed a normally distributed overall score for the 24 playgroup observations. Results from the internal consistency are consistent with those reported by Barros and Aguiar (2010) relatively to the Portuguese translation of the ITERS-R (Harms et al., 2012), where the alpha coefficient for the

subscale Interactions was higher than the other subscales. These results suggest caution should be used when conducting analyses at the subscale level.

Correlations between PERS overall score and PERS subscales were moderate to high, except for the Space and Materials subscale, which is similar to the correlations found in a Chinese study using ECERS-R (Li et al., 2014). Results also noted that trained independent coders were quite consistent in their ratings, suggesting that the PERS can be applied reliably by multiple observers. This is an important finding given that we designed the PERS as an easy-to-use measure that can be administered by professionals and by parents managing community playgroups with families and children with minimal, but adequate, additional training.

As expected, results from the sensitivity of the PERS indicated that playgroup quality was higher at T2 specifically considering the materials used and the opportunities for free play. Playgroup sessions significantly improved the opportunities of contact with everyday materials, disposable materials and contact with nature, and there were accessible materials that promoted curiosity, discovery, and challenge. Also, playgroup sessions significantly improved the opportunities for children to play freely, and the present adults (caregivers or facilitators) stimulated interest, supported and challenged children in the course of the play. These results provide preliminary evidence that the PERS is sensitive to the continuous training of the facilitators, and changes in playgroup practice.

Results from assessing the PERS structural validity revealed a good factor structure with four distinct but interrelated dimensions: Playgroup Interactions, Playgroup Experiences, Play-based Learning and Facilitators Practices and Interactions. However, scores for three items of the PERS were eliminated in this final structure because of their insufficient variability. In our sample, the item Indoor Space was found to be highly skewed, with high averages. This may have been a function of program requirements, i.e., all spaces were carefully assessed before the playgroups began to determine minimal quality standards. Low scores on the items Diversity of Dialogues and Diversity of Materials may have derived from the somewhat low diversity of participating families. Therefore, because of contextual characteristics, we acknowledge that these three items may require further validation, and support the inclusion of these items in future studies that use the PERS.

The pattern of moderate correlations with the ASOS, another measure of process quality, provides initial support for construct validity. Interestingly, results showed that the PERS dimension of Playgroup Experiences was positively associated with the Stimulation subscale of the ASOS. This dimension includes the routines and activities of the playgroup sessions where the facilitator role is very important to foster stimulating and interesting activities for the

families. Results also show a positive association, albeit not statistically significant, between the PERS dimension of Facilitators Practices and Interactions and the Stimulation subscale of the ASOS. This dimension includes the interactions and practices of the facilitator with children, but it also includes interactions and practices with the caregivers, which may explain why it did not reach significance. These positive associations of PERS dimensions with a measure of process quality focused on interactions provide an indication that PERS is a valid assessment of one of the central and specific features of playgroup quality, i.e., interactions between adults and the children but also among adults in different roles (facilitators and caregivers).

Results from the criterion-related validity revealed unexpected and expected results. Results suggested that playgroups with more families were positively associated with more play-based activities, which is contrary to our initial hypothesis. This indicates potential challenges in the implementation of small playgroups, limiting their quality. It is also important to note that our sample was composed by very young children, with a mean age of 18 months. This suggests that playgroups ideally need to be within a range of 4-10 families to allow for more play-based activities to occur for the youngest children, which is aligned with the recommendation by Social Entrepreneurs (2011). The presence of at least four families in playgroups may generate a greater variety of expressed views and ideas about play materials or may increase the chances of a child playing with a peer of the same age. We did not find a relation between the years of experience of the facilitators and PERS scores, which can be due to the small size of the sample or the lack of variability of the years of experience of the facilitators.

Finally, as expected, the factor dimension of Play-based Learning was positively associated with higher outcomes for children in language and in practical reasoning. This finding is supported by the literature that states that play is associated with the development of language and mathematical ability in children (Hancock et al., 2012). All combined the results for the criterion-related validity add evidence that the PERS is assessing what it has meant to assess.

3.5.1. Limitations

Some limitations of this study should be acknowledged when interpreting our findings. Although a random sampling procedure was used to select 13 playgroups, because of low attendance, only data from 12 playgroups was collected. This condition should be considered when generalizing the results. Also, the restricted variability of facilitators experience may have limited the power to detect statistically significant associations between this variable and the

factor dimensions of the PERS. In addition, the internal consistency for the Contact with Diversity dimension was low, which may be due to the lack of variability of the families, or the facilitators were less prepared to assure those requirements.

The focus of this study was to detail the development of PERS and present the first reliability and validity results. It is important to highlight that our findings are preliminary. To continue to study reliability and validity of PERS, we recommended to have larger, more diverse samples, with careful attention paid to testing their equivalence across different contexts of playgroups, different countries, and in playgroups with children differing by age and by socioeconomical background.

3.6. Conclusion

Monitoring the quality of playgroups is important to understand how a playgroup can work to benefit families and children and provide clear and practical indications of how it can be improved. However, when evaluating quality in playgroups, researchers have relied on traditional measures developed for ECEC services or with slight adaptations, which fail to capture dimensions of quality that are specific to playgroups.

Our study provides support for the PERS as a short, reliable, multidimensional measure of playgroups quality that is relatively inexpensive to administer in field settings. In addition, our findings suggest that this instrument yields data that are psychometrically valid.

A major advantage of this measure lies in its flexibility and sensitivity. The PERS can be applied to different contexts of playgroups and is also useful for informing service planning and practice. The careful selection of indicators can help improve the quality of playgroups by improving practices, and ultimately child outcomes, as outlined in this study.

Long-term experimental impacts of playgroups on child and family outcomes

4.1. Abstract

Playgroups are gatherings for young children and their caregivers to engage in social and play-based activities. Evidence shows that attendance in playgroups is associated with improvements in child language, cognition, and behavior skills. However, with few exceptions, little is known about the long-term impacts for families and children that participated in playgroups, in comparison to families and children who did not participate.

Using data from the Playgroups for Inclusion project and controlling for a range of socio-economic and family characteristics, we estimated the experimental impact of a playgroup intervention for children zero to four years on the home environment and caregiving practices and on the children's cognitive development, behavior and temperament two years and two years and a half after pretest.

Long-term impact experimental estimates indicated that playgroup intervention was associated with improved child language outcomes when children were aged three and three and a half years old. There were no other significant impacts. Analysis of moderation of long-term impacts by key demographic characteristic showed that children whose caregivers were unemployed benefitted the most from attending playgroups in their language outcomes.

Despite data limitations, this study provides the first-ever long-term experimental evidence of the impact of participation in playgroups, specifically in terms of better outcomes for children.

Keywords: playgroups, early childhood education and care, longitudinal study, attendance,

RCT

4.2. Introduction

In Portugal, prior to the pandemic, 9% of children aged three to five years-old did not attend preschool education (OECD, 2019). Only 40% of the children up to two years old attended a formal education service, and disadvantaged children were over 25% less likely to enroll in preschool (OECD, 2019). The employment rates of mothers with children up to three years old were close to 80% (OECD, 2019), however there was still low coverage (49%) of care and preschool education for children up to three years old in nurseries, child minders, and daycare providers, particularly in urban and densely populated areas (GEP/MTSSS, 2020).

Playgroups are regular, organized gatherings of parents or other caregivers and young children typically held twice a week during school term for a few hours' duration. They provide preschool-aged children with opportunities to socialize and to learn about their environment through play with other children and adults in a safe, supportive and fun environment (Dadich & Spooner, 2008; Commerford & Robinson, 2016). There are two broad playgroup models: community playgroups which are parent led; and professionally supported or facilitated playgroups (Dadich & Spooner, 2008; Commerford & Robinson, 2016).

The early childhood years are a critical developmental period (OECD, 2018), and playgroups offer a timely opportunity for children to play and socialize with others and develop a range of skills before they start kindergarten or preschool. Shared assumptions underpinning the evidence base for supported playgroups include ecological models of human development (Bronfenbrenner, 2005), the importance of play in early years (Brockman et al., 2011a, 2011b) and the group as a social support for parents or caregivers (Hanna et al., 2002). Although this theoretical foundation, few studies have investigated how effective playgroups are at achieving their objectives of supporting children and caregivers, particularly in the long term.

Research evidence about playgroup benefits provides indication that such service has the potential to improve a range of outcomes for children, such child language, cognition, and behavioral skills (Barata et al., 2017; Deutscher et al., 2006), and for parents, such as enhancement of the quality of parent-child interactions (Evangelou et al., 2007) and access to health and education services (McLean et al., 2022). However, weaknesses in the design of these studies limit the internal and external validity of findings. For example, the use of non-experimental studies.

With few exceptions, little is known about the long-term impacts for families and children that participated in playgroups. The collection of data after families have left playgroup programs is important to assess whether the impacts of playgroup attendance on child and

caregiver outcomes stay the same, become stronger over time, or fade out (Hedeker & Gibbons, 2006). The evidence on parenting support is clear that to be effective, parenting support programs need to be of high quality, to be sustained over long periods, and families need to attend regularly (Whittaker & Cowley, 2012).

The Portuguese project “Playgroups for Inclusion” (Barata et al., 2017) was the first randomized controlled trial (RCT) of a playgroups intervention. From 2017 to date, four more studies were published using randomized controlled trials of a playgroups intervention (Armstrong et al., 2021; Ericksen et al., 2018; Trost et al., 2021; Williams et al., 2020). However, none of these studies estimates long-term impacts of the programs. Since playgroup services in Portugal were a novelty, i.e., there was very limited offer of playgroups by a few local small-scale mostly private services, it is possible to have a true estimate of the long-term outcomes for families and children that participated. Specifically, we analyzed the long-term experimental impacts of the playgroups for inclusion intervention on the home environment and caregiving practices, child development, and child temperament and behavior.

4.2.1. The supported playgroup model

Playgroups are implemented in several countries (e.g., Italy, German, UK, Australia) and are very important in the family support gap between maternity services and children's school entry (Dadich & Spooner, 2008). For example, in England, over 6% of preschool children up to four years old participate in playgroups (Department for Education, 2018) and in Australia, over a third of preschool aged children and their parents participate in playgroups (Gregory et al., 2016). In both countries there are local and national playgroup associations (e.g., Preschool Playgroup Association in the UK; Playgroup Associations of Australia) with professional coordinators, and with established procedures for organizing and running a group (e.g., Playgroup Associations of Australia, 1979).

Supported playgroups are used mostly throughout Australia and are normally funded by state and federal governments within a prevention and early intervention policy framework (Jackson, 2009). Supported playgroups are widely understood to be effective in engaging families living in disadvantaged communities because it provides an informal, non-threatening service that promotes easy access to more formal types of support (Commerford & Robinson, 2016, 2017).

In Portugal, playgroups are considerably less common and less formal and typically do not receive support from national or local associations. However, prior to the Covid19 epidemic, playgroups were implemented at a national level in the pilot project Playgroups for Inclusion

or “*Grupos Aprender, Brincar, Crescer*” (Learn, Play, Grow Groups). This project aimed to develop, test, and disseminate an innovative educational program for Early Childhood Education and Care (ECEC) and was targeted to families with children up to four years old, not participating in any of the currently available ECEC services. The project was carried out in five districts of Portugal (Barata et al., 2017).

Playgroups for Inclusion was designed as supported playgroups with paid and continuously trained facilitators that provided semiweekly sessions during 10 months and were supervised by a hired early childhood educator. Three main goals were established for the playgroups: to promote children and caregiver’s natural learning through play; to promote wellbeing and socialization environments between all participants; and to ensure a space and time for exploration, discovery, sharing and positive interactions between adult(s) and children, among adults and among children (Barata et al., 2017; Freitas-Luís, 2017). Activities included music and singing, imaginative, outdoor and free play, art and craft activities, and were designed with the purpose of creating opportunities to learn, socialize, develop and increase skills, while aiming to meet the needs and interests of the participants, in a climate of interaction, sharing and cooperation with peers.

The Playgroups for Inclusion project included an experimental study and a study of program implementation. A Theory of Change (Weiss, 1995; Connell & Kubisch, 1998; Anderson, 2005) underpinning playgroups and the core intended outcomes of playgroups was developed given the existing evidence base and the practice and research knowledge of the authors, in order to select a set of primary and secondary outcomes for measurement. A family-level randomized controlled trial (RCT) was implemented: after pretest assessment of all families, families were randomly assigned to two groups: an intervention group which offered 10 months of playgroups intervention, and a control group which offered three months of the intervention after posttest. The first wave of data collection (pretest) took place in August 2015 and the second wave (posttest) took place one year later. The study of program implementation aimed to describe playgroup development over 10 months, examining the nature and extent of implementation in key areas such as quality of playgroups (Barata et al., 2017). Results of the experimental evaluation of Playgroups for Inclusion in Portugal indicated positive effects of the intervention on child and caregiver outcomes. For the caregivers, playgroups improved the extent of responsiveness and involvement in learning and stimulating the child. For the children, playgroups improved their developing ability to reason through manual and visuospatial problems, use language for comprehension, inhibit poor behavior, and focus on task. Program effects varied by employment status, with positive significant benefits for employed caregivers

in involvement, i.e., the ability of caregiver to interact physically with the child (Barata et al., 2017).

4.2.2. Longitudinal studies in Early Childhood Education and Care

Most early intervention programs targeting the children's cognitive, social or emotional development fail to continue monitoring the children once the programs come to an end (Durlak et al., 2011). In some ECEC programs where follow-up is conducted, it is often observed that the effects completely fade out over time. For example, findings from Puma and colleagues (2012) with a national sample of Head Start centers, detected immediate impacts on cognitive, socioemotional and behavior skills for children at the end of the Head Start year; however, over the next couple of years, the intervention revealed minimal to no statistically significant differences between intervention and control groups.

Conversely, in some renowned early intervention studies, such as the High/Scope Perry Preschool Study (Schweinhart & Weikart, 1997) and the Abecedarian Approach (Sparling et al., 2021), initial fadeout is followed by the detection of impacts in various domains of adulthood, including higher educational attainment, improved cognitive abilities, better social skills, and lower rates of delinquency and criminal behavior. It is unclear how these long-term impacts have emerged, despite their initial fadeout on target skills; however, Bailey and colleagues (2017) theorized three processes that might explain such phenomenon: skill-building (interventions that aim to foster skills that would not have developed over time without the intervention), foot-in-the-door (interventions that aim to provide children with the appropriate skills at the optimal developmental stage); and sustaining environments (ensuring that the environments continue to hold high quality standards after the intervention has ended).

Longitudinal studies about playgroup impacts are very few. Further, all those studies were in Australia and non-studies have an experimental design. In a longitudinal study by Williams and colleagues (2017), playgroup attendance when children were age 2 to 3 years was associated with higher parental engagement in home learning activities when children were aged 4 years which, in turn, was associated with stronger expressive vocabulary scores for children. In the longitudinal study by Hancock and colleagues (2012), the authors found a positive association between continued playgroup attendance and learning competence outcomes for children, particularly those from a disadvantage background, and between continued playgroup attendance and social-emotional functioning for girls from a disadvantage background.

It is important to note that not all studies have found the same benefits, and more research is needed to fully understand the long-term impacts of playgroups. With fewer resources at their disposal, families with low socio-economic status (SES), such as families unemployed or underemployed, stand to gain more from attending playgroups (Hancock et al., 2012). It is worth noting that playgroups should be safe and inclusive environments, where children and parents from different backgrounds feel welcome and respected.

4.2.3. The present study

The goal of the present study is to estimate long-term experimental impacts of the playgroups for inclusion intervention on child and family outcomes. It addresses the following research questions:

1. What is the long-term experimental impact of the Playgroups for Inclusion intervention in children and family outcomes?
2. Did the long-term experimental impacts vary by caregiver employment status?

In this study, to address concerns of limited statistical power, by prioritizing as primary outcomes the measures that applied to the full sample of children and families and presented higher quality according to data and data collection experience, we selected the first three main outcomes and the secondary outcomes where the primary results were more expected in the Playgroups for Inclusion project (Table 4.1.).

Table 4.1. Main and secondary outcomes.

<i>Home environment and caregiving practices</i>	<i>Child cognitive development</i>	<i>Child Temperament and behavior</i>
• Responsivity • Acceptance • Involvement • Academic stimulation	• Hearing and language • Performance • Practical Reasoning	• Negative affect • Effortful control

In terms of expected results, we hypothesized that:

a) Caregivers in the intervention group would demonstrate, at least two years after pre-test, increased quality of the home environment and caregiving practices, compared to the control group, namely in responsivity, acceptance, involvement (according to the age of each child) and in academic stimulation (this domain was applied only to children two years old or above).

b) Children of the intervention group would demonstrate, at least two years after pre-test, higher scores than control children in the domains of cognitive development: hearing and language; performance and practical reasoning (this last domain is applied particularly to children with two years of age or above).

c) Children of the intervention group would demonstrate, at least two years after pre-test, significant differences in two domains related with temperament and behavior, when compared to children in the control group: reduced negative affect, as well as increased effortful control.

By focusing on caregivers that were recently unemployed and underemployed, we also hypothesized that these target group would be the most likely to benefit, in the long term, from the Playgroups for Inclusion Intervention.

4.3. Method

4.3.1. Data sources and participants

In this study, we use data from the project Playgroups for Inclusion. Data from one district was excluded for ethical reasons (one evaluator was also a caregiver in this district). Family recruitment for the Playgroups for Inclusion project was multifaceted to maximize diversity of families within districts, i.e., while most families were directly recruited through ads and community dissemination; most target group families joined the groups through referrals from entities in the community, government and social support network. The project network included 947 entities that worked directly with families. Among the entities/institutions contacted, 94 were community health centers, 24 were child protection services, and 48 were entities that were part of the social welfare ministry.

Families and children were followed up two times: the wave 3 of data collection took place in August 2017 (one year after the end of the project) and the wave 4 of data collection took place 6 months after, in February 2018. This study used data from wave 1, 3 and 4 to estimate the long-term impacts of playgroups on the families and children. Figure 4.1. outlines the sample selection procedure.

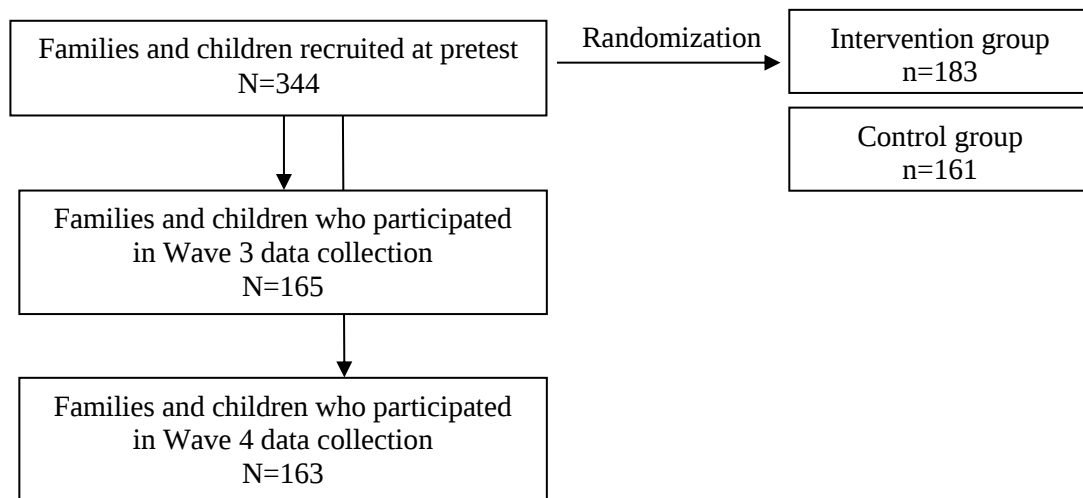


Figure 4.1 Sample selection procedure.

Average child age at wave 1 was 18 months, ($SD = 11$; range 18 days-46 months), at wave 2, 37 months, ($SD = 10$; range 21-63 months) and, at wave 4, 44 months, ($SD = 10$; range 27-69 months) respectively. Approximately 47% were female ($n=160$). Approximately 4% of the children had already attended ECEC prior to enrolling in playgroups ($n=13$).

Concerning the participating caregivers, the mean age was 34 years, 93% were female ($n=319$), 85% were mothers ($n=295$), 54% completed the secondary education ($n=186$), and 79% were cohabitating (i.e., living with a partner, $n=270$). Across the three waves of data used in these analyses, 95% ($n=157$ at wave 3 and $n=155$ at wave 4) were the same respondent and the remaining 5% ($n=8$) had some variation of informants across waves, such as a grandparent or aunt who completed data collection at wave 3 or wave 4.

Regarding the caregivers' household, only 32% of the caregivers were employed ($n=109$). The mean household income was approximately between 308€ to 690€; and approximately 10% of the household incomes were not reported. Approximately 56% of the household's income were above the minimum wage per employed adult ($n=191$). In the sample, 61% of the families were referred by entities. Background characteristics of the pretest sample are shown in Table 4.2.

Table 4.2. Background characteristics of the pretest sample.

Variables	Pretest sample					
	N	Mean/% (SD)	Min.	Max.	Skew	Kurt
Families referred by entities	344	60.50%	0	2	.59	-1.18
<i>Child</i>						
Age (months)	344	17.53 (10.99)	.60	46.00	.50	-.59
Female	343	46.50%	0	1	.14	-1.99
Attended ECEC	341	3.08%	0	1	4.85	21.60
Number of siblings	341	.99(1.23)	0	6	1.47	2.45
Number of siblings below age 6	318	.31(.53)	0	2	1.47	1.24
<i>Caregiver</i>						
Age (years)	334	33.97(10.46)	14	73	1.48	2.83
Female	344	92.07%	0	1	-3.99	14.00
Employed	338	31.07%	0	1	.76	-1.43
Secondary education	330	54.01%	0	1	-2.58	-1.95
Cohabiting	329	78.05%	0	1	-1.68	.83
<i>Caregiver household</i>						
Income (range in €)	311	4.03	1	10	.77	-.61
No welfare	328	69.50%	0	1	-1.09	-.94

Note: The caregiver household income labels below and above the mean are: 3=758€ to 1010€; 4=1011€ to 1262€⁸.

After the pretest, 183 families were randomly assigned to the intervention condition and 161 to the control condition. There were no significant differences between the intervention and control conditions on the demographic characteristics and in all but two of the pretest assessments (Table 4.3.). These results suggest that the randomization was done with integrity, and that the pretest sample could provide the necessary confidence in the validity of the short- and long-term impact estimates.

⁸ The monthly minimum wage in Portugal in August 2015 was 530€/month. At the current date of this study (May 2023) the minimum wage is 760€/month (DGERT/MTSSS, 2022).

Table 4.3. Background characteristics of participating dyads (caregivers and children), by assigned randomization group.

Variables	Intervention group		Control group		<i>t</i>	<i>df</i>
	<i>n</i>	<i>Mean/% (SD)</i>	<i>n</i>	<i>Mean/% (SD)</i>		
Families referred by entities	106	58.00%	102	63.00%	-1.07	342
<i>Child</i>						
Age (months)	183	17.99(10.80)	161	17.00(11.21)	-.83	342
Female	177	34.40%	157	33.30%	-1.22	341
Attended ECEC	182	3.00%	159	4.00%	.53	339
Number of siblings	182	.97(1.30)	159	1.01(1.15)	.25	339
Number of siblings below age 6	169	.27(.50)	149	.36(0.57)	1.50	316
<i>Caregiver</i>						
Age (years)	177	34.55(10.44)	157	33.32(10.48)	-1.07	332
Female	180	95.00%	157	94.00%	-.30	335
Employed	180	33.00%	158	32.00%	-.22	336
Secondary education	178	59.00%	152	53.00%	-1.04	328
Cohabiting	178	82.00%	151	82.00%	.02	327
<i>Caregiver household</i>						
Income (range in €)	162	4.15(2.96)	149	3.90(2.83)	-.78	309
No welfare	174	72.00%	154	73.00%	.20	326

Note. The caregiver household income labels below and above the mean are: 3=758€ to 1010€; 4=1011€ to 1262€

Of the pretest sample approximately 48% families and children were assessed at wave 3 and 4 (165 and 163 dyads respectively). Intervention and control groups included in waves 3 and 4 were still equivalent in pretest assessments and demographic characteristics. However, families and children participating at waves 3 and 4 were significantly different from families and children not participating at waves 3 and 4 on six out of 13 pretest variables (Table 4.4. and Table 4.5.).

Table. 4.4. Background characteristics of the dyads (caregivers and children) at wave 3 of data collection.

Variables	Sample that participated on wave 3		Sample that did not participate on wave 3		<i>t</i>	<i>df</i>	<i>p</i>
	N	Mean/% (SD)	N	Mean/% (SD)			
Families referred by entities	85	52.00%	123	69.00%	-3.08	342	.00*
<i>Child</i>							
Age (months)	165	17.59 (10.96)	179	17.47 (11.23)	-.09	342	.92
Female	164	44.00%	179	49%	.97	341	.33
Attended ECEC	164	4.00%	177	4%	.14	339	.89
Number of siblings	164	.93 (1.20)	177	1.04 (1.25)	.80	339	.42
Number of siblings below age 6	154	.26 (.47)	164	.37 (.59)	1.78	316	.08
<i>Caregiver</i>							
Age (years)	156	36.13 (10.69)	178	32.08 (9.12)	-3.59	332	.00*
Female	158	97.00%	179	93.00%	-1.672	335	.10
Employed	162	40.00%	176	25.00%	-3.00	336	.00*
Secondary education	154	66.00%	176	48.00%	-3.20	328	.00*
Cohabiting	156	85.00%	173	80.00%	-1.14	327	.25
<i>Caregiver household</i>							
Income (range in €)	152	4.58 (2.92)	159	3.51 (2.78)	-3.31	309	.00*
No welfare	156	80.00%	172	66.00%	-2.84	326	.01*

* $p < .05$

Note. The caregiver household income labels below and above the mean are: 3=758€ to 1010€; 4=1011€ to 1262€.

Table 4.5. Background characteristics of the dyads (caregivers and children) at wave 4 of data collection.

Variables	Sample that participated on wave 4		Sample that did not participate on wave 4		<i>t</i>	<i>df</i>	<i>p</i>
	N	Mean/% (SD)	N	Mean/% (SD)			
<i>Families referred by entities</i>	83	51.00%	125	69.00%	-3479	342	.00*
<i>Child</i>							
Age (months)	163	17.10 (10.65)	181	17.91 (11.31)	.68	342	.50
Female	162	45.00%	181	48.00%	.56	341	.58
Attended ECEC	161	3.00%	180	4.00%	.64	339	.52
Number of siblings	162	.95 (1.22)	179	1.02 (1.25)	.54	339	.59
Number of siblings below age 6	151	.25 (0.44)	167	.37 (.61)	2.20	316	.05*
<i>Caregiver</i>							
Age (years)	154	36.54 (10.73)	180	31.77 (9.74)	-4.25	332	.000*
Female	156	96.00%	181	94.00%	-.65	335	.52
Employed	160	41.00%	178	25.00%	-3.16	336	.00*
Secondary education	152	70.00%	178	45.00%	-4.66	328	.00*
Cohabiting	152	87.00%	177	78.00%	-2.10	327	.04*
<i>Caregiver household</i>							
Income (range in €)	150	4.55 (2.96)	161	3.55 (2.76)	-3.11	309	.002*
No welfare	153	82.00%	175	65.00%	-3.41	326	.001*

* $p < .05$

Note. The caregiver household income labels below and above the mean are: 3=758€ to 1010€; 4=1011€ to 1262€.

4.3.2. Measures

4.3.2.1. Home environment and caregiving practices

To assess the home environment and caregiving practices we used the Home Observation for Measurement of the Environment (HOME, Caldwell & Bradley, 1984; adapted for the Portuguese population by Abreu-Lima, 2009). The HOME includes subscales that assess aspects of parental caregiving, such as the avoidance of punishment and the stimulation of the child's language skills, as well as characteristics of the physical environment, such as the provision of toys, games, and reading materials. This inventory is administered through a semi-structured interview and direct observation. Based on the Theory of Change for the project Playgroups for Inclusion and data constraints (for example, very few or any children less than 2 years of age at wave 3 and 4), we excluded the subscale only applied for children aged 0-2 years (Involvement) and selected only the subscales applied for both age groups (0-2 and 2-4): Responsivity, or the extent of responsiveness of the caregiver to the child (0-2 years: 11 items;

2-4 years: 7 items); Acceptance - parental acceptance of suboptimal behavior and avoidance of unnecessarily harsh restriction or punishment (0-2 years: 7 items; 2-4 years: 4 items) and Academic Stimulation - parental involvement in child's intellectual development (2-4 years: 6 items).

HOME subscale scores are usually computed by summing the total number of correct items (Abreu-Lima, 2009). However, because two out of the three subscales (i.e., Responsivity and Acceptance) are applied to two age groups (0-2 and 2-4 years) and have a different number of items for each age group, a simple sum of correct items would make total scores non-comparable between age groups. Moreover, a number of children changed from one age group (0-2) to another (2-4+) from pretest to wave 3 (87 and 89 cases for Responsivity and Acceptance, respectively) and from pretest to wave 4 all children had two or more years. To address this problem, we used the percent of correct items per subscale as our total (primary) outcomes, and pulled together subscale totals for the two age groups.

Descriptive statistics for all subscales are presented in Table 4.6. Cronbach's alpha varied between .53 and .73 for Responsivity, between .33 and .58 for Acceptance, and between .41 and .74 for Academic Stimulation, which are similar to the pilot study (Barata et al., 2017).

Table 4.6. Descriptive statistics for HOME subscales at pretest, wave 3 (W3) and wave 4 (W4), using percent of correct items per subscale.

Variables	N	% (SD)	Min.	Max.	Skew	Kurt	Alpha	
							Under 2	Above 2
Responsivity	336	50.00 (15.84)	0	68.75	-.75	-.06	.69	.53
W3 Responsivity	164	39.10 (11.88)	0	68.75	-.37	4.81	.72	.66
W4 Responsivity	162	38.62 (8.70)	6.25	43.75	-1.67	-1.65		.73
Acceptance	337	66.25 (18.83)	0	100	-.79	.18	.41	.33
W3 Acceptance	164	46.34 (13.71)	0	87.5	.10	6.30	.67	.58
W4 Acceptance	162	46.06 (9.39)	0	50	-2.96	12.05		.56
Academic stimulation	86	52.32 (31.76)	0	100	-.43	-1.13		.74
W3 Academic stimulation	148	76.76 (21.13)	0	100	-1.03	3.91		.55
W4 Academic stimulation	161	77.52 (16.55)	20	100	-1.43	5.82		.41

4.3.2.2. Child cognitive development

To measure children's development, we used the Portuguese version of Griffiths Mental Development Scales (GMDS; Griffiths, 1954; 0-2 years old: Huntley, 1996; 2-8 years old: Luiz et al., 2006). Based on the Theory of Change for the project Playgroups for Inclusion, we

applied only the following subscales: Hearing and Language, rating the child's ability to hear, listen, and comprehend, as well as to express themselves; Performance, rating the visual perception awareness, including working speed and precision and Practical Reasoning, a 2 to 8-year-old child's ability to use past learning experiences to solve problems, as well as their understanding of basic mathematical concepts and moral issues (only at wave 3 and 4).

GMDS subscale raw scores were computed by adding the total number of correct items in accordance with the GMDS 0-2 years Manual (Huntley, 1996). Although the computation of raw scores proposed for the GMDS 2-8 years Analysis Manual (Luiz et al., 2006) is different, the same procedure was carried out for all children in the sample to allow for comparison of results across the two age groups. Descriptive statistics for the subscales are presented in Table 4.7. Cronbach's alpha varied between .73 and .98 for language, between .25 and .98 for performance, and between .85 and .95 for practical reasoning, which are similar to the pilot study (Barata et al., 2017) except for the case of performance at wave 4 that was lower.

Table 4.7. Descriptive statistics for GMDS subscales at pretest, wave 3 (W3) and wave 4 (W4).

Variables	N	Mean (SD)	Mental age (months)	Min.	Max.	Skew	Kurt	Alpha
Language	325	37.09 (17.66)	14.50a	3	75	.03	2.18	.98
W3 Language	146	65.43 (15.67)	37.00b	31	178	2.40	19.51	.73
W4 Language	152	73.34 (11.06)	47.00b	40	93	-.43	2.47	.95
Performance	322	37.37 (17.35)	14.00a	2	69	-.29	2.12	.98
W3 Performance	153	62.82 (8.50)	34.00b	39	84	-.32	3.49	.94
W4 Performance	154	70.08 (12.62)	49.00b	39	163	4.19	30.00	.25
Practical Reasoning	20	6.80 (3.50)		0	13	-.37	2.29	.82
W3 Practical Reasoning	75	14.39 (6.97)	46.00b	0	31	.13	2.72	.92
W4 Practical Reasoning	102	18.16 (8.83)	51.00b	0	36	-.003	2.43	.95

^a Average mental age was calculated according to the GMDS 0-2 years Manual (Huntley, 2007).

^b Average mental age was calculated according to the GMDS 2-8 years Analysis Manual Luiz, Faragher, et al., 2008).

4.3.2.3. Child temperament and behavior

To measure the temperament and behavior of children, we used the Very Short Form of the Early Childhood Behavior Questionnaire (ECBQ, Putnam et al., 2002; translated and adapted

with the authorization of the authors by Klein & Linhares, 2006b; Very Short Form developed by Putnam et al., 2010) for children aged 18 months to 36 months and the Very Short Form of the Children's Behavior Questionnaire (CBQ, Putnam & Rothbart, 2006; translated and adapted with the authorization of the authors by Klein et al., 2009; Very Short Form developed by Putnam & Rothbart, 2006) for children over 36 months.

Based on the Theory of Change for the project Playgroups for Inclusion, we applied only the following subscales of both questionnaires: Negative affect and Effortful Control. For ECBQ, Cronbach's alpha varied between .55 and .63 for the Negative affect subscale, and between .68 and .77 for Effortful control subscale. For CBQ Cronbach's alpha varied between .70 and .77 for the negative affect subscale, and between .63 and .70 for effortful control subscale.

The two measures evaluate the temperament and behavior in different areas and consider the activities typical of each age group, using a 7-point Likert scale. Subscale composites were computed using the average of all subscales non missing items. Descriptive statistics for the subscales are presented in Table 4.8.

Table 4.8. Descriptive statistics for Temperament and Behavior Subscale Scores at pretest, wave 3 (W3) and wave 4 (W4).

Variables	N	Mean (SD)	Min.	Max.	Skew	Kurt	Alpha
<i>Very Short Form of the Early Childhood Behavior Questionnaire (ECBQ) - children 18-36 months</i>							
Negative Affect	144	3.04 (.90)	1.17	4.83	.02	-.79	.64
Effortful Control	144	4.90 (.74)	3	6.55	-.28	-.42	.51
W3 Negative Affect	80	3.58 (.78)	2	5.55	.19	-.33	.55
W3 Effortful Control	80	4.91 (.76)	3.42	6.83	-.08	-.65	.68
W4 Negative Affect	46	3.61 (.79)	2	5.73	.19	.17	.63
W4 Effortful Control	46	4.92 (.76)	3.42	6.67	.04	-.39	.77
<i>Very Short Form of the Children's Behavior Questionnaire (CBQ) – children over 36 months</i>							
W3 Negative Affect	85	4.47 (.96)	1.90	6.27	-.18	-.57	.70
W3 Effortful Control	85	5.45 (.72)	3.67	7	-.25	-.44	.70
W4 Negative Affect	115	4.41 (.96)	2	6.58	.03	-.28	.77
W4 Effortful Control	115	5.57 (.63)	3.75	6.92	-.28	.26	.62

4.3.3. Procedures

For each dyad - child and caregiver – the participation in the pretest and follow up tests implied an evaluation by one or two elements of the evaluation team, which could take place at the home of the caregiver or in an equivalent space suggested by the caregiver. Typically, the home visit lasted two hours maximum.

Research assistants directly observed the quality of the home environment and caregivers' interactions with the children and rated the culturally sensitive items. During the observation, the child and the caregiver were invited to maintain their routine and regular everyday activities. The standardized evaluation protocol for child development was typically administered one-on-one. The caregiver was also interviewed by the research assistants, using diagrams and flow charts for closed-format questions. This procedure was especially relevant given expected low levels of literacy in some of the recruited families. The follow up evaluation protocols included the same measures of the pretest phase, except for time-invariant family sociodemographic characteristics, which were completed only when data was missing from pretest. Research assistants were never given information concerning the experimental condition assigned to families.

4.3.4. Covariates

Child variables (gender, age in months), and caregiver variables (gender, education level, completed secondary education, cohabitation status⁹ and employment were collected using the family sociodemographic characteristics questionnaire adapted from Pessanha and colleagues (2013).

4.3.5. Data analysis

In order to answer the question “What is the long-term experimental impact of the Playgroups for Inclusion intervention in children and family outcomes?”, we compared outcomes for 68 control to 97 intervention families and children on wave 3, and 65 control to 98 intervention families and children on wave 4. We used ordinary least squares regression models (OLS) that account for covariates, as well as for the nesting of caregivers and children within playgroups by using playgroup random effects (Bloom et al., 2007; Hedges & Hedberg, 2007; Raudenbush et al., 2007) and district fixed effects, with correction of the standard errors (Huber-White) for

⁹ Caregivers' age was omitted from the models because it was highly correlated with other variables and had more missing values than other alternatives.

playgroup clustering. The average (unadjusted) intraclass correlation was .07 for wave 3 and .08 for wave 4. Because pretest scores for similar constructs at waves 3 and 4 were not available for outcomes (Academic Stimulation, Practical Reasoning, Negative Affect and Effortful Control), and we had evidence of the integrity of the randomization at wave 3 and wave 4, pretest scores were not included in the models for these outcomes.

We fit the following general model on both wave 3 and wave 4:

(4.1)

$$Outcome_{jk} = \beta_0 + \beta_1(Treat)_{jk} + \beta_2(X)_{jk} + \beta_4(M)_l + (\varepsilon_{jk})$$

Where the subscripts j and k refer to child (or caregiver or family), and district respectively; Outcome is the child-level outcome at wave 3 or wave 4; Treat is a child-level, dichotomous variable set equal to 1 if the child was in the intervention group and to 0 if the child was in the control group; X is a vector of child, caregiver or family-level characteristics (child: age, gender; caregiver: gender, employment status, educational level, cohabitation status), M is a vector of three dichotomous variables indicating which of 4 districts the playgroup was located; and ε is a child-level random error term. β_0 is the estimate of the impacts of playgroups on the examined outcome.

For all analyses, we pooled data across the four districts and used fixed effects for districts because: 1) districts are very diverse and were not sampled randomly; 2) fixed effects help eliminate bias by controlling for all observed and unobserved effects at the district “level” of analysis. Including covariates in impact models is recommended practice in the analysis of randomized trials to increase precision of the impact estimates (Bloom et al., 2007). Regarding missing data, our analysis sample used only cases with data on outcomes.

In the Results section, for both wave 3 and wave 4, we report the sample size (number of families and number of playgroups), the adjusted mean of the intervention and of the control families, the adjusted difference between these groups, the standard error of the adjusted difference, the level of significance of the difference, and the effect size based on these final models that are of prime interest for policy decisions about playgroups. The effect size was computed by dividing the estimated adjusted difference between groups by the standard deviation of the indicator for the comparison group (Gormley, et al., 2005; Wong et al., 2008) and indicates the magnitude of the playgroup effect regardless of the instrument used. Full model impact results using OLS are available in Appendix C. No estimates for district dummies

were included in the reporting for confidentiality reasons. Data were analyzed in Stata (Version 13).

To answer the question “Did long-term experimental impacts vary by caregiver employment status?”, we entered interactions between the intervention indicator and the specific subgroup indicator into the OLS models specified above. Because of concerns with statistical power, we only examined interaction effects when the estimates for the intervention indicator or subgroup indicator were significant (i.e., when there was a main effect of the intervention or the subgroup). Of those tested, bar charts were included for significant interaction effects to maximize ease of interpretation. Results are presented in the form of a bar chart representing estimated adjusted means for all subgroups.

4.4. Results

4.4.1. What was the long-term experimental impact of Playgroups for Inclusion in the home environment and caregiving practices?

In Table 4.9., we present the long-term impact results of playgroups in the home environment and caregiving practices for the three subscales at wave 3 (two years after the pretest when children were 3 years - mean) and wave 4 (two years and a half after pretest when children were 3 years and a half - mean): Responsiveness, Acceptance and Academic Stimulation.

At wave 3, accounting for child and caregiver characteristics, playgroup caregivers were on average 0.422 points lower in Responsiveness ($s.e. = 1.234, p = .789$), 0.299 points lower in Acceptance ($s.e. = 1.711, p = .879$) and 2.177 lower in Academic Stimulation ($s.e. = 2.340, p = .468$), than control caregivers. At wave 4, accounting for child and caregiver characteristics, Playgroup caregivers were on average 0.644 points lower in Responsiveness ($s.e. = 0.665, p = .514$), 1.672 points lower in Acceptance ($s.e. = 0.923, p = .307$) and 2.055 higher in Academic Stimulation ($s.e. = 1.565, p = .507$), than control caregivers. There were no significant differences between Playgroup and Control caregivers. Effects sizes ranged from -0.115 to -0.033 at wave 3, and from -0.228 to 0.119 at wave 4 in family environment and parental and caregiving practices.

Table 4.9. Impact results of Playgroups at wave 3 and wave 4 in the Home Environment and Caregiving practices.

Outcome	Playgroups	Number of Children/Families	Adjusted mean for intervention group	Adjusted mean for control group	Diff	Sig.	Effect size
Wave 3							
Responsiveness	28	150	39.089	39.511	-.422	.789	-.033
Acceptance	28	150	45.901	46.200	-.299	.879	-.019
Academic Stimulation	26	137	74.921	77.098	-2.177	.468	-.115
Wave 4							
Responsiveness	27	145	38.204	38.848	-.644	.514	-.068
Acceptance	27	145	45.206	46.878	-1.672	.307	-.228
Academic Stimulation	27	144	78.249	76.194	2.055	.507	.119

4.4.2. What was the long-term experimental impact of Playgroups for Inclusion on children's cognitive development?

In Table 4.10, we present the long-term impact results of playgroups on child cognitive development for the three subscales at wave 3 (two years after the pretest when children were 3 years - mean) and wave 4 (two years and a half after pretest when children were 3 years and a half - mean): hearing and language, performance, and practical reasoning.

At wave 3, accounting for the group of covariates, playgroup children were on average 2.455 points higher in Hearing and Language/Language ($s.e. = 1.414$, $p=.048$), 0.266 points higher in Performance ($s.e. = 0.569$, $p=.705$) and 1.731 points ($s.e.=1.248$, $p=.093$) higher in Practical Reasoning than control children. At wave 4, accounting for the group of covariates, playgroup children were on average 2.525 points higher in Language ($s.e. = 0.812$, $p=.042$), 2.065 points lower in Performance ($s.e. = 0.969$; $p= .491$) and 1.056 points higher in Practical Reasoning ($s.e. = 1.062$, $p=.093$). Significant effects were found for Language at wave 3 and wave 4. Effects sizes ranged from 0.030 to 0.247 at wave 3 and from 0.116 to 0.226 at wave 4 in child cognitive development; of which 0.185 and 0.226 was associated with significant impacts at wave 3 and wave 4 respectively.

Table 4.120. Impact results of Playgroups at wave 3 and wave 4 in child cognitive development.

Outcome	Number of Playgroups	Number of Children / Families	Adjusted mean for intervention group	Adjusted mean for control group	Diff	Sig.	Effect size
Wave 3							
Language	27	134	67.340	64.885	2.455	.048*	.185
Performance	28	140	62.932	62.666	0.266	.705	.030
Practical Reasoning	25	69	10.486	8.755	1.731	.093~	.247
Wave 4							
Language	27	136	74.433	71.908	2.525	.042*	.226
Performance	27	138	70.537	72.602	-2.065	.491	-.116
Practical Reasoning	25	92	15.311	14.255	1.056	.493	.117

Note. ~ $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$.

4.4.3. What was the long-term experimental impact of Playgroups for Inclusion on Child Temperament and Behavior?

In Table 4.11., we present the long-term impact results of playgroups on child behavior and temperament for the two subscales at wave 3 (two years after the pretest when children were 3 years - mean) and wave 4 (two years and a half after pretest when children were 3 years and a half - mean): Negative Affect and Effortful Control.

At wave 3, accounting for the group of covariates, playgroup children under 36 months were on average 0.07 points lower in Negative Affect ($s.e. = 0.305$, $p = .697$), and 0.086 points higher in Effortful Control ($s.e. = 0.238$, $p = .593$), than Control children. Playgroup children above 36 months were on average 0.001 points lower in Negative Affect ($s.e. = 0.143$, $p = .995$), and 0.081 points higher in Effortful Control ($s.e. = 0.136$, $p = .695$), than Control children. There were no significant differences between Playgroup and Control children.

At wave 4, accounting for the group of covariates, playgroup children under 36 months were on average 0.23 points higher in Negative Affect ($s.e. = 0.498$, $p = .257$), and 0.03 points lower in Effortful Control ($s.e. = 0.474$, $p = .921$), than Control children. Playgroup children above 36 months were on average 0.32 points higher in Negative Affect ($s.e. = 0.105$, $p = .854$), and 0.20 points higher in Effortful Control ($s.e. = 0.075$, $p = .115$), than control children. There were no significant differences between Playgroup and Control children. Effects sizes ranged from -0.082 to 0.11 at wave 3 and from -0.04 to 0.33 at wave 4 in child temperament and behavior.

Table 4.11. Impact results of Playgroups at wave 3 and wave 4 on child temperament and behavior.

Outcome	Number of Playgroups	Number of Children /Families	Adjusted mean for intervention group	Adjusted mean for control group	Diff	Sig.	Effect size
Wave 3							
Negative Affect	27	71	3.834	3.904	-.070	.697	-.082
Negative Affect (above 36mo)	24	76	4.446	4.447	-.001	.995	-.001
Effortful Control	27	71	5.227	5.141	.086	.593	.110
Effortful Control (above 36mo)	24	76	5.370	5.289	.081	.695	.110
Wave 4							
Negative Affect	22	39	3.637	3.407	.230	.257	.319
Negative Affect (above 36mo)	26	101	4.451	4.419	.032	.854	.032
Effortful Control	22	39	5.129	5.158	-.029	.921	-.04
Effortful Control (above 36mo)	26	101	5.617	5.414	.203	.115	.33

4.4.4. Did the long-term experimental impacts of Playgroups for Inclusion vary by caregiver employment status?

In Figure 4.2. we present the subgroup impact results of Playgroups on child cognitive development at wave 4, namely for the subscale Language. Accounting for child and caregiver characteristics, playgroup children whose caregiver was unemployed presented a significantly larger difference in Language to their Control counterparts whose caregivers were also unemployed, than children whose caregiver was employed ($M_{int}=73.854$, $M_{cont}=71.219$ for unemployed caregivers; $M_{int}=74.856$, $M_{cont}=74.334$ for employed caregivers; $\beta_{empStatus*int} = -4.989$, $s.e. = 2.135$, $p=.027$).

No other significant subgroup effects for caregiver employment status were found for the outcomes of Home environment and Parenting Practices, Child Cognitive Development and Child Temperament and Behavior.

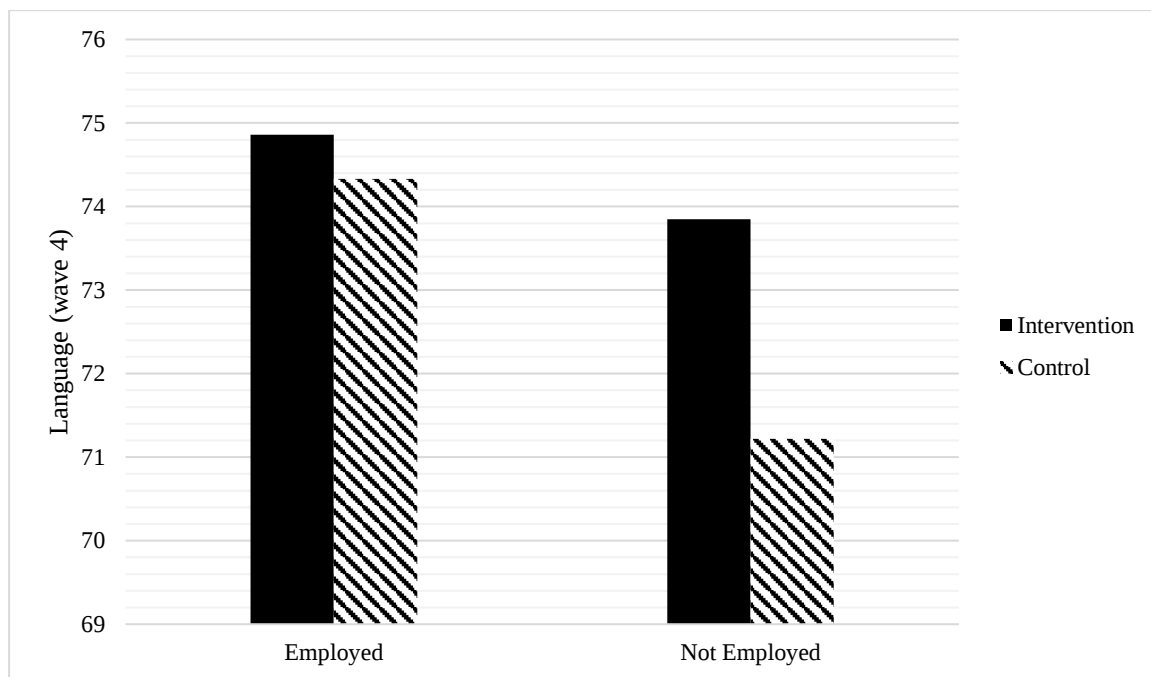


Figure 4.2. Subgroup impact results for Language, by Caregiver Employment Status at wave 4

4.5. Discussion

The goal of this study was to evaluate the longitudinal experimental impacts of the program Playgroups for Inclusion on families' outcomes. Using follow-up data from the Playgroups for Inclusion project and controlling for a range of socio-economic and family characteristics, we estimated the experimental impact of a playgroup intervention for children zero to three years on the home environment and caregiving practices, children's cognitive development, behavior and temperament, two years (wave 3) and two and a half years later (wave 4).

Overall, our findings showed that playgroup children in the long term continued to benefit from the intervention, scoring significantly higher than control children in a measure of the child's ability to produce sounds, to understand and use words, to follow simple and complex instructions, and to engage in conversation. Although effects sizes are small (0.19 at wave 3 and 0.23 at wave 4), these magnitudes must be considered in this context of low-dosage intervention (four hours a week) and are very commonly found in early childhood interventions (Hill et al., 2008).

This result is consistent with previous findings showing that playgroups are associated with improvements in child language, specifically stronger expressive vocabulary and communication skills (Green et al., 2018; Page et al., 2022; Williams et al., 2017). The playing moments on playgroups, the established dialogues and materials exploration in each session, the involvement of the families in the challenges and dynamics promoted by the facilitators or

other caregivers, may have made a big contribution to this result. This result is consistent with the findings of a recent meta-analysis, noticing the importance of caregiver behavior – sensitive-responsive and warmth parenting, quantity of child-directed speech, quality of the language input and nature of the caregiver-child interactions - to child language outcomes, particularly in the long term (Madigan et al., 2019). This finding may suggest that, with the participation on playgroups, caregivers became aware of the importance of giving time to the children to play and the importance of participating with them in that time, interacting, observing, listening, and talking to them, and maintained or even increased those moments in the following year.

Furthermore, two years and a half after pretest, children of playgroup caregivers who were unemployed presented higher scores in child's hearing and language skills, than their control counterparts who were also unemployed. This result is in line with extant literature showing that children in high-risk circumstances whose families engage in these types of services tend to have better learning and social outcomes than those who do not (Daniels, 1995; Garces et al., 2002; Gormley et al., 2005; Hancock et al., 2012, 2015; Wuermli et al., 2021). It is important to note, however, that this result was sustained after controlling for all family characteristics, including the child's age and gender, and the education level and cohabitation status of the caregiver. This result may indicate that providing playgroup services may act as a protective effect, particularly in the context of adversity.

Two years after the pretest, we still found positive (but non-significant) long-term effects of the playgroup intervention on the child's developing ability to reason through manual and visuospatial problems, including speed of working and precision, and on effortful control, the ability to voluntarily control attention, inhibit inappropriate behavior, and focus on task. We also found a positive significant (at trend level) long-term effect of the playgroup intervention on the child's ability to solve practical problems, understand basic math's concepts and understand moral issues. This may indicate a focus of the intervention on the promotion of development and the precursors of learning. In fact, in a recent systematic review on playgroups by McLean and colleagues (2022), 45% of the studies report language and cognition outcomes for children, noting that playgroup facilitator role was the most identified feature in 55% of the studies.

Long-term effects of playgroups on the home environment and caregiving practices were non-significant. In contradiction with our hypotheses, and extant literature, the estimated effects on the family and caregiver outcomes two years, and two years and a half after pretest, were consistently negative (non-statistically significant) indicating a potential long-term effect of playgroup interventions in favor of the control group. A possible explanation for this apparent

contradiction may be the developmental challenges of the children. Behavior issues, like tantrums, trouble in eating and sleeping and problems sharing may be a few of those challenges (Smith & Fox, 2003). When in a group, for many caregivers for the first time, caregivers may compare their children with others and became less tolerant. An Australian quasi-experimental study also found a decreased on parental competence after a 6-week playgroup intervention with children with established delays (Fabrizi & Hubble, 2017).

Two years and a half after pretest, playgroup children below 36 months seemed to reduce their effortful control (but non-significant) and playgroup children above 36 months also seemed to present higher negative affect (but non-significant), i.e., children's ability to inhibit poor behavior and to regulate behavior and emotions, as reported by their caregivers. The developmental challenges of the children may decrease the caregiver's ability to deal with less adequate behaviors. This result suggests that caregivers may need more or/and continued parenting role and social support to have more positive interactions with children. The playgroup environment often encourages caregivers to share their experiences of parenting with one another and enables them to be "scaffolded" by facilitators if needed, which are experiences not only social in nature but educative as well. Without this kind of support continuously, caregivers may have become lost when dealing with the children, particularly those in the context of adversity. In the face of these results, we would posit that parenting support services may be needed in a continuous fashion, being available early on during the first years, but then also through toddlerhood.

4.5.1. Implications for research and practice

This study is significant because there is limited rigorous evidence on playgroups, especially in the long term. It helps to understand how playgroups benefit children's social and learning development. By demonstrating long-term impacts of playgroups, this study shows how valuable it is to assess these relationships over time. The experimental design of this study makes a significant contribution to the international evidence base for supported playgroups which has thus far been limited by predominantly low-quality and non-experimental research designs (McLean et al., 2022; Williams et al., 2020). To our knowledge, this study was the first known RCT of a supported playgroup program without a specific curriculum implemented that included a control group of children not attending playgroup.

Our findings reinforce the literature that states that playgroup participation has beneficial outcomes for children and adds that these benefits are still visible one year after the playgroup ends, especially on child language. Further, our finding that children from families with at least

a caregiver unemployed have a positive outcome in language skills one year and a half after the playgroup end is an important one. The research on early childhood education and care has traditionally concentrated on examining socio-economic disparities and exploring how high-quality early childhood education and care can serve to compensate families and children living in a context of a deprived home environments (Duncan & Magnuson, 2013; Leseman & Slot, 2014; Schleicher, 2019). The findings from this study demonstrate that playgroups also have the potential to serve as a protective factor to offset the negative effects associated with living in a disadvantage background.

Furthermore, our findings support a universal approach of playgroups to benefit children and families of any background. This new evidence offsets previous recommendations based in earlier evidence from the United States (Reid & Ready, 2013) and longitudinal studies from the Netherlands (de Haan, et al., 2013) stating that children from families living in a disadvantaged context who attended ECEC programs together with children from a variety of backgrounds gained more in cognitive skills, than attending together with children in socio-economically homogeneous groups. Our evidence discourages targeted playgroup interventions, at least in the Portuguese context.

4.5.2. Limitations and future research

Despite the relevance of this study in demonstrating that playgroups have long-term effects on children, it is important to keep in mind that research is an ongoing process and that studies about long-term effects are a valuable tool to understand the effects of interventions, but the results must be interpreted considering the limitations and the context of the study. We found that families and children participating at waves 3 and 4 were significantly different from families and children not participating at wave 3 and 4 on six out of 13 pretest variables. Caregivers participating at waves 3 and 4 were older, had higher rates of employment, higher levels of education and higher household incomes than caregivers not participating at waves 3 and 4, making the follow-up samples more affluent. There were also more families directly recruited participating at wave 3 and 4. Finally, families participating at wave 4 had a significantly larger percentage of caregivers living with a partner. This can indicate an underestimate of impact, given that prior literature seems to indicate that children likely to gain the most benefit from attending a playgroup were those who are less likely to access these services (for example, Daniels, 1995; Hancock et al., 2012). We also have found little evidence of moderation of impacts by subgroup (namely for employed participants), which we attribute to limited statistical power.

Supported playgroups represent a service model with high potential for addressing parenting support needs in a wide range of contexts. Providing such a universal parent support program may be significant to benefit families and children better start of life.

Conclusions

5.1. Summary of findings

Investing in a child's development during their early years (from birth to around 8 years old) can have significant positive impacts on their future and the well-being of their family and community (OECD, 2018, 2021; Shonkoff & Phillips, 2000). By providing children with a solid foundation of support, care, and education during this critical period, they are more likely to develop the necessary skills, abilities, and attitudes to succeed in school and later in life. This, in turn, can lead to a range of positive outcomes, such as better health, higher educational attainment, more stable employment, and stronger social connections. Ultimately, by investing in the early years, we can help to build a more prosperous and thriving society for all (Duncan et al., 1994; Huston et al., 1994; Love et al., 2005; NICHD, 2005; Melhuish et al., 2015).

Considering that playgroups are an informal type of early education and care that has proven to be beneficial for children and families, the main aim of this thesis was to extend the existing literature using an experimental trial of an innovative playgroup intervention in Europe by making a first approach to the effects of playgroup dosage and quality on home environment and caregiving practices, and on children's cognitive development, temperament and behavior. We also wanted to monitor long-term impacts of this playgroup intervention one year (Follow-up 1) and one year and a half (Follow-up 2) after it ended on these same outcomes.

Overall, findings from the three studies are aligned with the international literature, as well provided important theoretical and methodological contributions, informed public policies and practice, and gave insights for future research. In this chapter, we present an overview of the findings from each study, highlight the theoretical, methodological and practical implications of this thesis, present the main limitations of the studies along with suggestions for future research, and finally present the concluding remarks.

We began this thesis by stating the theoretical background for the three studies conducted as part of this research project. We highlighted the relevance of this work considering increased scientific and political recognition regarding the benefits of attending playgroups for all children, and its potential to counteract early achievement gaps between children and families living in disadvantaged backgrounds and children and families not living in disadvantaged backgrounds. We also stated that there are very few studies about the long-term effects of playgroups on child and family outcomes, and that they are all concentrated in Australia. We

also highlighted that playgroup dosage appears to be important for family and, consequently, children's outcomes, and that dimensions of playgroup quality may be important, especially in fostering children development in specific domains. Finally, we explained that this research was developed in Europe, particularly in Portugal, where the Playgroups for Inclusion project took place.

In Chapter 2, we presented an experimental study of the association between playgroup dosage and home environment and caregiving practices, as well as children's cognitive development, temperament and behavior. In this study, by applying the ASPES method (Peck, 2013) to playgroups for the first time, we were able to create experimentally valid subgroups defined by attendance on playgroups (predicted high and low-dosage subgroups) and then estimate playgroup effects on those predicted to attend more/fewer playgroup sessions, in comparison with the control group. Our findings revealed that a high-dosage of playgroups improved children's hearing and language skills, when compared to their would-be-high-dosage counterparts in the control group. We also found that a low-dosage of playgroups improved children's developing abilities to reason through manual and visuospatial problems, including speed of working and precision, when compared to their would-be-low-dosage counterparts in the control group. Finally, this study unexpectedly demonstrated also that a low-dosage of playgroups decreased caregivers' acceptance of their children behavior and increased the negative affect of children.

In Chapter 3 we presented our study about the development and validation of a new observational scale to assess the quality of playgroups. Until this date, the existing literature about quality of playgroups, and the impact of such on development, was scarce and inconclusive. This gap in scientific knowledge was almost entirely due to the consistent application of quality assessment tools that were designed for formal ECEC contexts but applied to informal playgroup settings (Melhuish, 1994). As such, previous information on playgroup quality had limited practical and policy value. To address this gap, we developed and validated a new measure: The Playgroup Environment Rating Scale (PERS). Our findings revealed that the PERS is a short, reliable, multidimensional measure of playgroups quality that is relatively inexpensive to administer in field or community settings. Moreover, the positive associations of PERS factor dimensions with a measure of process quality focused on interactions (Adult Style Observation Schedule [ASOS], Laevers, 2000) provided an indication that PERS is a valid assessment of one of the central and specific features of playgroup quality: interactions. Results also indicated that the PERS indicators for Play-based Learning were positively associated with higher outcomes for children in language and in practical reasoning,

providing initial evidence of the association between playgroups quality and children's development.

In Chapter 4, we presented the first experimental study of the long-term effects of playgroups, in our case two years and two years and a half after pre-test. To our knowledge, this study was also the first known RCT of a supported playgroup program without a specific curriculum implemented that included a control group of children not attending playgroup. Our findings revealed that playgroup participation had a long-term effect on children's hearing and language skills one year and one year and a half after the playgroups end. We also found (at trend level) that one year and half after the playgroups end, children improved their ability to solve practical problems and understand basic math's concepts. However, long-term effects of playgroups on the home environment and caregiving practices were non-significant and tendentially negative. Interestingly, we also found that children of playgroup caregivers who were unemployed presented higher scores in child's hearing and language skills, than their control counterparts who were also unemployed.

In sum, present findings suggest that playgroups in Europe are indeed beneficial for children and that their effects are still visible in the long term. This investigation also suggests that the impacts of playgroups are primarily on children's language, especially those who have a higher dosage of playgroups attendance. On the other hand, contrary to the literature, the results also suggest that playgroups may negatively influence parenting practices in the long term, specifically in accepting inappropriate behaviors of their children, and that this effect is significant for families with low-dosage of playgroups attendance. In families with low-dosage, the effects on children's behavior were also tendentially negative, with playgroup children demonstrating more negative affect than children in the control group. Interestingly, and in line with extant research (Deadman & McKenzie, 2020; Elango et al., 2015; Hancock et al., 2012) families and children from disadvantaged backgrounds, despite attending playgroups less often than families and children from more privileged backgrounds, are the ones who benefit the most. Both in long-term child language effects and short-term child performance.

Finally, the research on this thesis also provides preliminary evidence that the quality of playgroups is important, as playgroups with higher quality in Play-based learning showed significant positive associations with children's language and practical reasoning.

In a nutshell, these three studies advanced the field of research in playgroups in three ways:

- By using the methodological approach by Peck (2003) to study, experimentally, the role of dosage in playgroups;

- By developing and testing an observational measure to assess the quality of the environment on playgroups: The Playgroups Environment Rating Scale (PERS);
- By testing the long-term effects of playgroups using an experimental design with RCT.

5.2. Implications for practice and policy

Alongside with the theoretical and methodological contributions of this thesis, we hope our findings provide practical and policy insights to further the creation and/or implementation of more playgroups in Europe and, in particular, in Portugal. Our findings highlighted the role of the dosage and quality of playgroups and so, these findings may contribute to the development of more effective playgroups to promote family and children's outcomes, including long-term effects.

In Chapter 2, we found experimental evidence, based on the ASPES method, that children with a high-dosage of playgroup attendance had improved their language skills, and that children with low-dosage of playgroup attendance had improved cognitive performance, when compared to children that did not attend playgroups. This begs the question: how can we better reach families to maximize attendance, and therefore maximize playgroup impacts?

In the previous study (Barata et al., 2017), caregivers, facilitators and supervisors mentioned some strategies to improve playgroup attendance. On the one hand, caregivers suggested improvements on the playgroup schedule, structure and dynamics, and the importance for playgroups to be close to their homes. On the other hand, facilitators and supervisors suggested the promotion of playgroups and the importance to guarantee the interests and needs of the participant families. For practitioners and policymakers, this means that to better reach families and maximize attendance in playgroups, it is important to offer a range of playgroup schedules and locations to accommodate the diverse needs and preferences of families. It is important to consider different days of the week, morning and afternoon sessions, and locations in various neighborhoods to make playgroups accessible and convenient for families with different schedules and transportation limitations.

Further, it is also important to engage in extensive community outreach efforts to raise awareness about the benefits of playgroups and the opportunities they provide for children's development. In the Playgroups for Inclusion model, an extensive collaboration with more than 900 community organizations, schools, healthcare providers, and local authorities was established to promote playgroups, and an intensive dissemination campaign was developed

through flyers, social media, community events, and informational sessions. Nevertheless, more needs to be done. To guarantee the interests and needs of the participant families, it is important to regularly evaluate the playgroup quality with the PERS measure to identify areas for improvement and make necessary adjustments. Practitioners can also seek feedback from participating families and children to understand their experiences and suggestions for enhancing the playgroup. Continuous evaluation and improvement can help ensure that the playgroup experience meets the needs and expectations of families and children, increasing attendance and retention rates. For policymakers, this means that to maximize attendance to playgroups and promote children's developmental outcomes, they should be available close to the population, in libraries and public settings, such as schools.

Further, we found that families and children predicted to be in the low-dosage subgroup were from a socioeconomically disadvantaged background. The international literature has demonstrated that some early childhood education services, including playgroups, may have a greater positive influence on children from a socioeconomically disadvantaged background relative to children from more advantaged backgrounds (Deadman & McKenzie, 2020; Elango et al., 2015; Hancock et al. 2012). However, they need to be exposed to a good enough dosage to benefit from the playgroup offer. It is also important to recall that the Playgroup for Inclusion model was accessible to all and provided universally to caregivers of children not in creche. It was not a targeted service.

For policymakers, this means playgroups, as a policy, need to be proposed as a universal service for all families and children, maximizing but not targeting the involvement of families from disadvantaged backgrounds, to reduce inequalities and place the children in a good/better developmental pathway. There is some evidence that school playgroups, because of their public, universal nature, help establish social connections that are crucial for a smooth transition to school (McLean et al., 2014), and this is especially important for families who come from disadvantaged backgrounds (McLean et al., 2014). By having playgroups located in schools, it physically connects these families with the educational environment where their children will eventually go and may maximize benefits for all.

Our findings also suggested that there may be a tendency for negative effects of playgroups on home environment and caregiving practices, especially in families with limited playgroups attendance who came from a disadvantaged background. Although this finding did not fit our initial hypotheses, there are a few studies that shed light on this result (Fabrizi & Hubble, 2017; Li et al., 2017). For policymakers, this means that caregivers attending playgroups may need additional support and guidance to maximize their attendance and enhance their home

environment and caregiving practices. This could involve providing resources, workshops, or parenting programs that focus on promoting positive parenting strategies, fostering a stimulating home environment, and encouraging healthy child development. We know from research that programs that combine education and care for children with parental education seem to have a larger positive impact than those focused solely on children or on parents (Myers, 2004). For policymakers this means that, playgroups can support families as a complement of providing ECEC access to their children, especially in situations of families and children living in disadvantage backgrounds. In Italy, for example, some playgroups (or *Centri di Bambini e Genitore*) are provided in school settings and are available right after the school activities end, when the caregivers came to pick the children up (Musatti et al., 2017).

In Chapter 3, we demonstrated that it is possible to apply a short, reliable, multidimensional measure of playgroups quality that is relatively inexpensive to administer in field or community settings. Given the central role of monitoring in the promotion of quality ECEC services (OECD, 2018), we thus offer playgroup facilitators a measure that is valid and simple to use to monitor and improve program interactions and practices, and better adapt it to their target group. The PERS seems to be a valuable tool for such monitoring.

Further, we demonstrated that children who participated in high quality playgroups revealed higher levels of child language and practical reasoning. The quality dimension of the PERS that most contributed to this finding was Play-based learning, a dimension centered around free play, space organization and materials. Given such evidence, program promoters now have the initial evidence necessary to focus playgroup activities on play, and further encourage caregivers to provide opportunities for their children to play. For practitioners, this means that playgroup programs should focus on creating engaging, stimulating, and developmentally appropriate activities that promote language acquisition and problem-solving abilities. For policymakers, this means that it is crucial to invest in professional development and training for playgroup facilitators and educators. By equipping them with the knowledge and skills to create high-quality playgroup experiences, they can effectively facilitate child language development and practical reasoning. In the Playgroups for Inclusion model, the facilitators and supervisors were trained by a team of professionals in education in topics such as play-based learning strategies, effective communication techniques, and creating an enriching playgroup environment. At the end of the project, the implementation team elaborated the facilitators training manual (see Freitas-Luís et al., 2017b) and made it available to all. For policymakers, this also means how important it is to fund and support high-quality playgroup programs. Adequate resources should be allocated to ensure that playgroups have the necessary

materials and equipment. The funding should also be allocated to skilled facilitators and playgroup supervisors (early childhood educators) to create optimal learning environments. Supervisors in playgroups are rare. To our knowledge, just the *Centri di Bambini e Genitori* in Italy have a pedagogical coordinator supervising the playgroups (Hoshi-Watanabe et al., 2015). However, the supervisor's role is very important to support the facilitators in their work with the families and children, and to promote a time for reflection of practices.

Given the negative effects of COVID-19 pandemic, particularly the negative effects of the social distancing measures and lockdown on children's play (e.g., reduced socialization and playtime, changes in family routines), children's progress in reaching developmental milestones, such as language development, problem-solving skills, and social-emotional competencies may have been compromised by reduced opportunities for peer interaction and collaborative play (Casey & McKendrick, 2022; Engzell et al., 2021). Recent evidence also has shown negative consequences on the mental and developmental health of children due to the school closures, especially in families with low socioeconomic conditions (de Araújo et al., 2020). And so, it is important that caregivers strive to provide their children with regular opportunities to interact with other children, and playgroups need to be available, at an early age, to facilitate this.

In Chapter 4, we highlighted that one year and one year and a half after the playgroups ended, we still found a positive long-term effect of the playgroup intervention on child language. This finding underscores the importance of early intervention programs, such as playgroups, in promoting long-term language development in children. For policymakers, this means that it is crucial to invest in early childhood education initiatives with a play-based approach, such as playgroups, to improve language in a sustained way. Such investment may contribute to reduce the growing language gap (Hart & Risley, 2003) between families and children from advantage backgrounds and families and children from disadvantage backgrounds. We acknowledge that, in Portugal, the recent law (Law no. 2/2022) that guarantees free access to ECEC for all children born from September 1st, 2021, onwards is a first step to reduce such language gap and equal access to opportunities. However, playgroups should be a reality in Portuguese schools as well.

Further, our findings highlight the significance of creating language-rich environments, through play, at home, in schools, and in community settings. Caregivers/facilitators and early childhood educators can be encouraged to engage in playful activities with children, such as games and motors activities, experiences, and diverse explorations, visual arts, music and movement, story times, nursery and children rhymes, building of materials, talking, etc. With

such playful activities, the children learning will emerge naturally, but intentionally, from the interactions established between children, between adults and between adults and children. Others have referred to this type of activities a concept known as “language nutrition” (Zauche et al., 2017) to support child’s language development. For practitioners and policymakers this means that, it is important to focus on play-based practices in early childhood education programs and provide resources to support families in creating such environments.

5.3. Overall limitations and future directions

While these results are promising, and the study design represented a significant improvement over previous research in this field, they are not without some limitations (for specific limitations for each study see each limitation section in Chapters 2, 3 and 4). Also, a few questions are still unanswered and new ones have arisen.

First, this research suffered considerable statistical power limitations. Initial power estimates for the Playgroups for Inclusion project assumed recruitment of 940 to 950 families in total for the experimental trial. However, despite extensive recruitment efforts, the sample size achieved in the pretest phase was 416 families (44% of the proposed goal) and further reduced by 165 and 163 in the long-term experimental impact study (17% of the proposed goal). This indicated that this research was considerably underpowered since the pretest, which can impact the precision of the findings. The lack of sample was due, first and foremost, to the fact that one of the evaluators was also a caregiver in one of the playgroups in one district, which make us lost 73 families and children for the study of the experimental impacts of playgroups in the long term. The lack of sample was due also to impossibility of contact with families¹⁰ (does not include moved out the country), personal reasons/not interested in collaborating in the study and incompatibility of schedules. Future studies should aim to include more families and children and families and children in diverse contexts. This would increase the generalizability of the findings and allow for a more comprehensive understanding of the effects of playgroups.

Second, we acknowledged that the three selected subscales of the Griffiths Mental Development Scales (GMDS), our measure of child development, do not cover all aspects of children development, but only the related to precursors of learning. This limitation should be considered when generalizing the results. Previous playgroup research frequently relied on non-

¹⁰ We considered “impossibility of contact” after resorting to the different routes (telephone, email, address or entity).

validated measures or on caregiver or educator/professor/facilitator report to evaluate the outcomes for children (McLean et al., 2022). We suggest that future research on playgroups should continue to evaluate the children development with validate measures, exploring other domains of growth, development and knowledge, depending on the theory of change of each program. Researchers may consider using multiple measures to capture various aspects of child development, including language skills, cognitive abilities, social-emotional development, and practical reasoning.

Third, findings from Chapter 2 gave us more experimental evidence on how to improve dosage to expect child development outcomes. However, due to the limited statistical power we were unable to investigate the playgroup impacts on subgroups of real interest (i.e., families and children who were actually in the high- and low-dosage subgroups, as opposed to families and children predicted to be in the respective subgroups) and to investigate other interesting research questions such as: How about in playgroups with high quality and low-dosage? How about in playgroups with low quality and high-dosage? Future experimental studies should address this research questions. The ASPES method can be an ally in such type of study.

Fourth, findings from Chapter 3 gave us important insights about the role of quality in the outcomes for children that participate in playgroups. However, this study was non-experimental, and we cannot establish causal relationships between quality and child development. Future studies should seek to put resources in experimental designs using RCT to further study the role of quality in the outcomes for children (and families).

Further studies should also test and validate the PERS in other countries/settings. Preliminary findings about the using of the PERS in other playgroups settings in Portugal and in Italy provided some promising results. In Portugal, the PERS was tested in two other supported playgroups in a research for a master thesis of Castro (2018) and the PERS quality indicators were in parallel to the families and facilitators insights through interviews. The PERS was also tested in six playgroups (*Spazi Insieme*) in Roma (Italy) as part of the Complementary Formation Abroad of this PhD. According to the feedback of the facilitators, the reports made with the PERS monitoring were very useful in informing facilitators about areas of excellence and areas for improvement in their playgroups.

5.4. Concluding remarks

With this thesis, we aimed to begin to open the black box on the impacts of playgroups on outcomes for families and children, by investigating the role of dosage and quality in those

impacts, as well as long-term impacts. This thesis provided an innovative theoretical and methodological approach to the scientific evidence of playgroup quality, namely by the development of an observational measure to assess the quality of playgroups environment. We also contributed to playgroups research by conducting the first experimental design using RCT, monitoring long-term impacts and dosage.

On a wider range, the research from this thesis aimed to inform public policies, both national and in line with European strategies. It also sought to contribute to the design of robust evaluation and monitoring methodologies in social and community intervention projects, despite the challenges it entails.

We hope the findings from this research will stimulate future work, as well fuel change in the development of quality educational policies and practices for young children and their families.

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APPENDIX A

Independent t-test – families and children with and without dosage data

Table A.1. Baseline characteristics by dosage data.

	Has dosage data		Does not have dosage data			
Variables	n	Mean/% (s.d.)	n	Mean/% (s.d.)	t	df
<i>Family variables</i>						
Referred by entities	197	43.00%	219	32.00%	-2.20*	414
<i>Child variables</i>						
Age (months)	197	18.85 (11.27)	219	18.49 (11.94)	-.32	414
Female	197	48.00%	219	47.00%	-.24	414
Attended ECEC	196	4.00%	216	5.00%	.27	410
Number of siblings	196	0.98 (1.31)	217	1.17 (1.23)	1.53	411
Number of siblings below age 6	184	.32 (.55)	200	.34 (.54)	.27	382
<i>Caregiver variables</i>						
Age (years)	191	34.61 (11.22)	215	33.71 (10.47)	-.84	404
Female	197	95.00%	219	95.00%	-.22	414
Employed	193	29.00%	216	32.00%	.64	407
Secondary education	192	58.00%	210	50.00%	-1.57	400
Cohabiting	192	83.00%	209	80.00%	-.88	399
<i>Caregiver household</i>						
Income (range in €)	176	4.09	205	3.64	-1.52	379
No welfare	190	72.00%	210	68.00%	-.97	398
Number of people	197	4.12	219	4.29	1.18	414

Note: The caregiver household income labels below and above the mean are: 3=758€ to 1010€; 4=1011€ to 1262€.

~ p<.10, * p<.05, ** p<.01, *** p<.001.

APPENDIX B

Full model impact results of Playgroups for Inclusion intervention ordinary least squares regression models – predictive high and low-dosage subgroups

Table B.1. Full model impact results of Playgroups for Inclusion intervention on home environment and caregiving practices using ordinary least squares regression for predictive high-dosage subgroup.

VARIABLES	(1) HOME - Responsiveness b/se/ci95	(2) HOME - Acceptance b/se/ci95	(3) HOME - Involvement (under 24mo) b/se/ci95	(4) HOME - Academic Stimulation (above 24mo) b/se/ci95
Fase	-0.150 (2.041) -4.193 - 3.892	-1.431 (2.895) -7.165 - 4.302	7.029 (7.145) -7.436 - 21.493	8.620 (5.889) -3.119 - 20.358
T1_CriIdadeMeses	-0.676*** (0.093) -0.860 - -0.492	-0.872*** (0.130) -1.130 - -0.614	-0.364 (1.130) -2.652 - 1.924	0.518 (0.346) -0.171 - 1.208
CriFem	-0.508 (2.105) -4.675 - 3.660	2.226 (2.972) -3.661 - 8.112	4.777 (6.633) -8.650 - 18.205	0.031 (5.952) -11.835 - 11.897
T1_CuiFem	3.978 (4.253) -4.444 - 12.399	-0.961 (5.958) -12.762 - 10.840	12.887 (18.382) -24.325 - 50.100	2.626 (10.810) -18.924 - 24.175
T1_CuiEmpregado	-0.008 (2.265) -4.493 - 4.477	-5.706~ (3.196) -12.037 - 0.624	-9.516 (8.510) -26.744 - 7.712	-8.588 (6.334) -21.216 - 4.039
T1_CuiEscolSecComp	4.237~ (2.449) -0.613 - 9.088	9.765** (3.380) 3.069 - 16.460	32.428** (9.159) 13.887 - 50.969	16.003* (6.666) 2.714 - 29.292
T1_CuiCohab	5.307 (3.948) -2.510 - 13.124	6.490 (5.745) -4.889 - 17.869	-6.382 (17.084) -40.966 - 28.202	-6.648 (10.001) -26.585 - 13.289
dist2	3.466 (4.241) -4.934 - 11.865	2.705 (6.051) -9.280 - 14.689	35.616~ (19.031) -2.911 - 74.143	12.409 (11.220) -9.958 - 34.776
dist3	7.755 (5.401) -2.941 - 18.451	14.000~ (7.652) -1.155 - 29.155	44.624* (20.441) 3.244 - 86.004	9.216 (16.018) -22.716 - 41.148
dist4	8.769* (3.955) 0.937 - 16.602	8.133 (5.549) -2.859 - 19.124	36.557~ (18.972) -1.849 - 74.963	23.868* (9.913) 4.107 - 43.629
dist5	7.607~ (4.558) -1.419 - 16.632	8.342 (6.308) -4.151 - 20.836	62.566** (22.999) 16.006 - 109.126	19.110~ (11.004) -2.825 - 41.046
Constant	41.036*** (7.183) 26.811 - 55.261	52.751*** (10.211) 32.526 - 72.976	6.952 (30.140) -54.065 - 67.968	38.171~ (19.351) -0.404 - 76.747
Observations	130	128	50	84
R-squared	0.403	0.388	0.447	0.219

Note. ~ p<.10, * p<.05, ** p<.01, *** p<.001. Robust standard errors in parentheses.

Table B.2. Full model impact results of Playgroups for Inclusion intervention on home environment and caregiving practices using ordinary least squares regression for predictive low-dosage subgroup.

VARIABLES	(1) HOME - Responsiveness	(2) HOME - Acceptance	(3) HOME - Involvement (under 24mo)	(4) HOME - Academic Stimulation (above 24mo)
	b/se/ci95	b/se/ci95	b/se/ci95	b/se/ci95
Fase	0.436 (2.930)	-8.157* (3.386)	4.161 (8.590)	7.388 (8.064)
T1_CriIdadeMeses	-5.389 - 6.262 -0.663*** (0.128)	-14.887 - -1.427 -0.842*** (0.151)	-13.336 - 21.659 -0.305 (1.240)	-8.853 - 23.629 0.914~ (0.454)
CriFem	-0.917 - -0.409 1.687 (2.796)	-1.141 - -0.542 6.800* (3.244)	-2.830 - 2.220 -10.175 (8.122)	-0.000 - 1.829 1.201 (7.642)
T1_CuiFem	-3.872 - 7.246 -6.514 (9.848)	0.353 - 13.247 -11.478 (11.466)	-26.720 - 6.369 26.309 (27.655)	-14.191 - 16.592 31.154 (28.958)
T1_CuiEmpregado	-26.092 - 13.063 0.824 (3.292)	-34.269 - 11.313 6.347 (3.827)	-30.022 - 82.639 -1.571 (10.402)	-27.170 - 89.478 22.917* (9.088)
T1_CuiEscolSecComp	-5.721 - 7.369 5.604~ (3.291)	-1.260 - 13.954 4.752 (3.835)	-22.758 - 19.616 10.229 (9.609)	4.614 - 41.220 16.684~ (9.077)
T1_CuiCohab	-0.939 - 12.146 -0.942 (3.602)	-2.870 - 12.375 -0.114 (4.068)	-9.345 - 29.803 2.229 (9.667)	-1.599 - 34.966 10.094 (10.055)
dist2	-8.103 - 6.219 -1.433 (14.130)	-8.199 - 7.972 -6.233 (16.399)	-17.461 - 21.920	-10.158 - 30.346 14.771 (30.380)
dist3	-29.522 - 26.655 2.035 (4.469)	-38.828 - 26.362 0.675 (4.981)	-0.992 (11.618)	-46.418 - 75.960 16.910 (15.562)
dist4	-6.850 - 10.920 -0.742 (4.843)	-9.226 - 10.576 -2.595 (5.587)	-24.656 - 22.673 -28.016~ (15.351)	-14.434 - 48.254 15.709 (13.037)
dist5	-10.369 - 8.885 1.965 (3.574)	-13.700 - 8.510 3.707 (4.204)	-59.286 - 3.253 -10.533 (11.209)	-10.549 - 41.968 17.736~ (9.917)
Constant	-5.139 - 9.070 57.442*** (11.134)	-4.649 - 12.062 78.276*** (12.875)	-33.364 - 12.298 50.257 (31.917)	-2.237 - 37.709 -25.990 (33.946)
Observations	35.309 - 79.575 98	52.685 - 103.868 99	-14.757 - 115.270 43	-94.361 - 42.380 57
R-squared	0.334	0.409	0.309	0.400

Note. ~ p<.10, * p<.05, ** p<.01, *** p<.001. Robust standard errors in parentheses.

Table B.3. Full model impact results of Playgroups for Inclusion intervention on child cognitive development using ordinary least squares regression for predictive high-dosage subgroup.

VARIABLES	(1) GMDS - Hearing and Language / Language (C) b/se/ci95	(2) GMDS - Performance (E) b/se/ci95	(3) GMDS - Practical Reasoning (F) b/se/ci95
Fase	3.419* (1.379) 0.685 - 6.153	1.476 (0.936) -0.379 - 3.331	-0.142 (1.165) -2.476 - 2.192
T1_CriIdadeMeses	1.093*** (0.065) 0.964 - 1.223	0.871*** (0.043) 0.786 - 0.956	0.586*** (0.067) 0.452 - 0.721
CriFem	3.554* (1.422) 0.734 - 6.373	1.796~ (0.961) -0.107 - 3.700	0.113 (1.116) -2.122 - 2.347
T1_CuiFem	0.460 (2.751) -4.994 - 5.914	-0.117 (2.020) -4.119 - 3.885	1.016 (2.277) -3.544 - 5.577
T1_CuiEmpregado	1.300 (1.541) -1.755 - 4.354	0.287 (1.022) -1.738 - 2.312	-0.613 (1.167) -2.950 - 1.724
T1_CuiEscolSecComp	4.103* (1.641) 0.850 - 7.356	3.458** (1.100) 1.278 - 5.638	3.154* (1.308) 0.535 - 5.772
T1_CuiCohab	0.551 (2.702) -4.806 - 5.907	-0.091 (1.939) -3.933 - 3.751	2.295 (1.841) -1.393 - 5.982
dist2	-0.158 (2.890) -5.888 - 5.571	-0.692 (1.989) -4.633 - 3.249	-0.977 (2.228) -5.439 - 3.486
dist3	-3.873 (3.466) -10.745 - 2.998	-2.206 (2.518) -7.196 - 2.783	2.776 (4.686) -6.608 - 12.159
dist4	4.657~ (2.670) -0.635 - 9.950	0.459 (1.842) -3.190 - 4.109	1.255 (1.859) -2.468 - 4.978
dist5	4.245 (3.241) -2.180 - 10.671	-4.057~ (2.124) -8.265 - 0.150	-1.526 (2.010) -5.551 - 2.499
Constant	23.585*** (4.833) 14.004 - 33.166	33.926*** (3.472) 27.046 - 40.805	-13.108** (3.855) -20.826 - -5.389
Observations	119	125	69
R-squared	0.770	0.807	0.642

Note. ~ p<.10, * p<.05, ** p<.01, *** p<.001. Robust standard errors in parentheses.

Table B.4. Full model impact results of Playgroups for Inclusion intervention on child cognitive development using ordinary least squares regression for predictive low-dosage subgroup.

VARIABLES	(1) GMDS - Hearing and Language / Language (C)	(2) GMDS - Performance (E)	(3) GMDS - Practical Reasoning (F)
	b/se/ci95	b/se/ci95	b/se/ci95
Fase	-0.450 (1.519)	2.679* (1.271)	-0.184 (0.988)
T1_CriIldadeMeses	-3.476 - 2.575 1.033*** (0.074)	0.151 - 5.207 0.923*** (0.057)	-2.180 - 1.813 0.375*** (0.061)
CriFem	0.885 - 1.181 2.179 (1.452)	0.809 - 1.036 1.859 (1.236)	0.252 - 0.498 0.602 (0.985)
T1_CuiFem	-0.713 - 5.071 -5.937 (6.879)	-0.599 - 4.317 -0.981 (4.340)	-1.389 - 2.593 -3.849 (3.400)
T1_CuiEmpregado	-19.640 - 7.767 2.622 (1.803)	-9.612 - 7.650 1.329 (1.440)	-10.722 - 3.023 -0.201 (1.080)
T1_CuiEscolSecComp	-0.970 - 6.213 2.006 (1.689)	-1.534 - 4.192 2.156 (1.483)	-2.383 - 1.982 2.480* (1.105)
T1_CuiCohab	-1.359 - 5.371 -3.473~ (1.912)	-0.793 - 5.104 -0.708 (1.548)	0.247 - 4.713 0.972 (1.297)
dist2	-7.282 - 0.335 -1.591 (4.972)	-3.786 - 2.371 -1.697 (4.401)	-1.650 - 3.593
dist3	-11.496 - 8.313 1.234 (2.217)	-10.450 - 7.056 -1.407 (1.918)	-0.651 (2.443)
dist4	-3.183 - 5.650 2.348 (2.587)	-5.222 - 2.408 -0.361 (2.159)	-5.588 - 4.287 0.113 (1.631)
dist5	-2.805 - 7.501 -1.005 (1.951)	-4.655 - 3.934 -4.456** (1.640)	-3.184 - 3.410 -2.066 (1.327)
Constant	-4.891 - 2.882 37.932*** (7.564)	-7.718 - -1.194 34.186*** (4.902)	-4.747 - 0.616 -1.593 (4.114)
	22.863 - 53.001	24.437 - 43.935	-9.908 - 6.721
Observations	87	96	51
R-squared	0.769	0.789	0.551

Table B.5. Full model impact results of Playgroups for Inclusion intervention in child temperament and behavior using ordinary least squares regression for predictive high-dosage subgroup.

VARIABLES	(1) Negative Affect (under 36mo) b/se/ci95	(2) Effortful Control (under 36mo) b/se/ci95
Fase	-0.046 (0.163) -0.370 - 0.278	0.010 (0.139) -0.265 - 0.285
T1_CriIdadeMeses	-0.005 (0.009) -0.023 - 0.012	0.012 (0.007) -0.002 - 0.027
CriFem	0.043 (0.169) -0.292 - 0.378	0.119 (0.143) -0.165 - 0.403
T1_CuiFem	0.472 (0.363) -0.249 - 1.193	-0.285 (0.308) -0.897 - 0.326
T1_CuiEmpregado	0.361* (0.179) 0.006 - 0.717	0.113 (0.152) -0.189 - 0.414
T1_CuiEscolSecComp	-0.841*** (0.210) -1.257 - -0.424	-0.118 (0.178) -0.471 - 0.235
T1_CuiCohab	-0.747* (0.307) -1.357 - -0.137	-0.268 (0.261) -0.786 - 0.249
dist2	0.011 (0.338) -0.660 - 0.682	-0.206 (0.287) -0.775 - 0.363
dist3	-0.327 (0.412) -1.145 - 0.490	0.161 (0.349) -0.532 - 0.854
dist4	-0.325 (0.314) -0.947 - 0.298	-0.125 (0.266) -0.653 - 0.403
dist5	-0.305 (0.359) -1.017 - 0.407	-0.247 (0.304) -0.851 - 0.357
Constant	4.121*** (0.620) 2.892 - 5.351	5.273*** (0.526) 4.229 - 6.316
Observations	111	111
R-squared	0.210	0.085

Note. ~ p<.10, * p<.05, ** p<.01, *** p<.001. Robust standard errors in parentheses.

Table B.6 .Full model impact results of Playgroups for Inclusion intervention in child temperament and behavior using ordinary least squares regression for predictive low-dosage subgroup.

VARIABLES	(1) Negative Affect (under 36mo) b/se/ci95	(2) Effortful Control (under 36mo) b/se/ci95
Fase	0.352~ (0.201) -0.048 - 0.751	-0.010 (0.181) -0.372 - 0.351
T1_CriIdadeMeses	-0.006 (0.009) -0.024 - 0.013	0.007 (0.008) -0.010 - 0.024
CriFem	0.060 (0.194) -0.325 - 0.446	0.191 (0.175) -0.157 - 0.540
T1_CuiFem	-0.895 (0.640) -2.169 - 0.379	-0.168 (0.578) -1.319 - 0.983
T1_CuiEmpregado	-0.149 (0.231) -0.610 - 0.311	0.340 (0.209) -0.076 - 0.756
T1_CuiEscolSecComp	-0.547* (0.229) -1.002 - -0.092	-0.170 (0.206) -0.581 - 0.241
T1_CuiCohab	-0.009 (0.233) -0.474 - 0.455	-0.102 (0.211) -0.522 - 0.317
dist2	0.113 (0.645) -1.172 - 1.398	-0.126 (0.583) -1.286 - 1.035
dist3	0.453 (0.339) -0.222 - 1.127	-0.015 (0.306) -0.625 - 0.594
dist4	0.097 (0.323) -0.547 - 0.741	-0.138 (0.292) -0.720 - 0.444
dist5	-0.064 (0.258) -0.577 - 0.450	-0.027 (0.233) -0.491 - 0.437
Constant	4.329*** (0.722) 2.890 - 5.768	5.001*** (0.653) 3.701 - 6.301
Observations	87	87
R-squared	0.198	0.070

APPENDIX C

Full model impact results of Playgroups for Inclusion intervention ordinary least squares regression models for wave 3 and wave 4

Table C.7. Wave 3 full model impact results of Playgroups for Inclusion intervention on home environment and caregiving practices using ordinary least squares regression with correction of the standard errors for playgroup clustering.

VARIABLES	(1) HOME - Responsiveness b/se/ci95	(2) HOME - Acceptance b/se/ci95	(3) HOME - Involvement (under 24mo) b/se/ci95	(4) HOME - Academic Stimulation (above 24mo) b/se/ci95
Fase	-0.422 (1.561) -3.626 - 2.782	-0.299 (1.941) -4.282 - 3.685	1,866.668 (.) . - .	-2.177 (2.953) -8.259 - 3.904
T1_CriIldadeMeses	-0.113 (0.080) -0.278 - 0.052	-0.176 (0.119) -0.420 - 0.068	-1,500.001 (.) . - .	0.521** (0.151) 0.210 - 0.832
CriFem	-0.631 (1.370) -3.443 - 2.181	0.521 (1.852) -3.279 - 4.320	1,833.335 (.) . - .	5.282~ (2.883) -0.656 - 11.221
T1_CuiFem	-0.441 (2.981) -6.557 - 5.675	-4.839~ (2.485) -9.938 - 0.261		12.696 (13.673) -15.464 - 40.857
T1_CuiEmpregado	1.693 (1.790) -1.979 - 5.366	0.713 (2.237) -3.877 - 5.304	1,250.001 (.) . - .	1.845 (2.961) -4.252 - 7.943
T1_CuiEscolSecComp	3.372~ (1.945) -0.620 - 7.363	6.561* (2.777) 0.864 - 12.259	616.667 (.) . - .	14.807** (4.426) 5.691 - 23.923
T1_CuiCohab	-2.576 (2.480) -7.666 - 2.513	0.819 (3.544) -6.452 - 8.090	200.000 (.) . - .	-3.654 (5.082) -14.121 - 6.814
dist2	-0.279 (2.025) -4.434 - 3.875	2.625 (2.680) -2.874 - 8.124	-4,250.004 (.) . - .	2.824 (3.746) -4.891 - 10.540
dist3	-0.722 (1.936) -4.694 - 3.250	0.399 (2.528) -4.787 - 5.586	-4,100.004 (.) . - .	-0.564 (3.951) -8.701 - 7.573
dist4	-12.261*** (2.104) -16.579 - -7.943	-5.272~ (2.678) -10.767 - 0.223	-16.667 (.) . - .	-5.281 (3.512) -12.513 - 1.952
Constant	46.168*** (4.536) 36.861 - 55.476	50.684*** (4.972) 40.482 - 60.886	1,883.335 (.) . - .	48.372** (13.132) 21.326 - 75.418
Observations	150	150	10	137
R-squared	0.273	0.150	1.000	0.200

Note. ~ p<.10, * p<.05, ** p<.01, *** p<.001. Robust standard errors in parentheses.

Table C.8. Wave 4 full model impact results of Playgroups for Inclusion intervention in home environment and caregiving practices using ordinary least squares regression with correction of the standard errors for playgroup clustering.

VARIABLES	(1) HOME - Responsiveness	(2) HOME - Acceptance	(4) HOME - Academic Stimulation (above 24mo)
	b/se/ci95	b/se/ci95	b/se/ci95
Fase	-0.644 (0.973) -2.644 - 1.356	-1.672 (1.606) -4.973 - 1.629	2.054 (3.050) -4.216 - 8.325
T1_CriIdadeMeses	0.058 (0.060) -0.065 - 0.181	0.126 (0.091) -0.062 - 0.313	0.458*** (0.117) 0.217 - 0.698
CriFem	-1.541 (1.111) -3.824 - 0.742	1.632 (1.463) -1.375 - 4.640	-2.692 (2.993) -8.845 - 3.461
T1_CuiFem	-0.146 (1.462) -3.151 - 2.859	-1.175 (2.900) -7.137 - 4.787	9.189 (6.071) -3.290 - 21.667
T1_CuiEmpregado	-0.042 (1.110) -2.325 - 2.240	-0.372 (1.509) -3.474 - 2.731	0.694 (2.739) -4.935 - 6.324
T1_CuiEscolSecComp	2.221 (1.437) -0.733 - 5.175	1.937 (2.119) -2.418 - 6.293	1.847 (2.714) -3.732 - 7.426
T1_CuiCohab	3.110~ (1.602) -0.182 - 6.402	1.543 (2.831) -4.277 - 7.363	-2.175 (4.749) -11.935 - 7.586
dist2	-2.996~ (1.568) -6.219 - 0.227	-0.222 (1.378) -3.053 - 2.610	-2.712 (2.899) -8.671 - 3.247
dist3	-1.768~ (0.943) -3.708 - 0.171	-2.705 (2.288) -7.408 - 1.997	0.380 (2.627) -5.020 - 5.779
dist4	-13.076*** (0.903) -14.933 - -11.219	-7.635*** (1.552) -10.824 - -4.446	-10.312** (2.924) -16.321 - -4.302
Constant	39.716*** (2.195) 35.205 - 44.228	45.428*** (4.781) 35.601 - 55.256	64.341*** (8.662) 46.536 - 82.145
Observations	145	145	144
R-squared	0.481	0.147	0.160

Note. ~ p<.10, * p<.05, ** p<.01, *** p<.001. Robust standard errors in parentheses.

Table C.9. Wave 3 full model impact results of Playgroups for Inclusion intervention in child cognitive development using ordinary least squares regression with correction of the standard errors for playgroup clustering.

VARIABLES	(1) GMDS - Hearing and Language / Language (C) b/se/ci95	(2) GMDS - Performance (E) b/se/ci95	(3) GMDS - Practical Reasoning (F) b/se/ci95
Fase	2.454* (1.185) 0.019 - 4.890	0.266 (0.696) -1.161 - 1.693	1.731~ (0.988) -0.308 - 3.770
T1_CriIdadeMeses	1.027*** (0.076) 0.871 - 1.183	0.668*** (0.046) 0.574 - 0.762	0.577*** (0.103) 0.365 - 0.789
CriFem	5.546* (2.171) 1.084 - 10.008	1.265 (0.880) -0.542 - 3.071	2.961** (1.016) 0.864 - 5.057
T1_CuiFem	-28.117* (13.164) -55.175 - -1.058	-1.808 (1.441) -4.764 - 1.147	-0.815 (2.378) -5.722 - 4.093
T1_CuiEmpregado	-1.332 (1.556) -4.530 - 1.867	-1.556 (1.318) -4.260 - 1.147	-1.771 (1.179) -4.204 - 0.662
T1_CuiEscolSecComp	3.580 (2.135) -0.808 - 7.969	6.099*** (1.311) 3.408 - 8.790	5.356*** (1.213) 2.852 - 7.859
T1_CuiCohab	3.684~ (1.836) -0.089 - 7.457	0.452 (1.514) -2.653 - 3.558	1.141 (1.444) -1.839 - 4.120
dist2	1.499 (1.649) -1.891 - 4.888	1.211 (1.497) -1.860 - 4.281	-2.578~ (1.449) -5.570 - 0.414
dist3	-1.397 (1.778) -5.052 - 2.258	1.475 (1.170) -0.925 - 3.875	-0.035 (2.087) -4.342 - 4.271
dist4	1.869 (1.546) -1.309 - 5.048	-0.662 (1.039) -2.795 - 1.471	-0.837 (1.177) -3.267 - 1.593
Constant	64.289*** (12.123) 39.370 - 89.208	47.829*** (2.222) 43.269 - 52.388	-5.486 (3.822) -13.375 - 2.403
Observations	134	140	69
R-squared	0.683	0.727	0.566

Note. ~ p<.10, * p<.05, ** p<.01, *** p<.001. Robust standard errors in parentheses.

Table C.10. Wave 4 full model impact results of Playgroups for Inclusion intervention in child cognitive development using ordinary least squares regression with correction of the standard errors for playgroup clustering.

VARIABLES	(1) GMDS - Hearing and Language / Language (C) b/se/ci95	(2) GMDS - Performance (E) b/se/ci95	(3) GMDS - Practical Reasoning (F) b/se/ci95
Fase	2.524* (1.181) 0.097 - 4.951	-2.066 (2.958) -8.146 - 4.015	1.056 (1.518) -2.077 - 4.188
T1_CriIdadeMeses	0.773*** (0.047) 0.675 - 0.870	0.542*** (0.111) 0.313 - 0.771	0.725*** (0.083) 0.553 - 0.897
CriFem	2.509* (1.183) 0.077 - 4.941	4.411~ (2.200) -0.112 - 8.933	1.280 (1.221) -1.240 - 3.800
T1_CuiFem	-1.104 (4.185) -9.707 - 7.498	3.829 (3.242) -2.836 - 10.494	0.642 (1.766) -3.003 - 4.287
T1_CuiEmpregado	0.357 (1.261) -2.236 - 2.949	-2.619 (1.967) -6.661 - 1.424	-0.367 (1.271) -2.991 - 2.257
T1_CuiEscolSecComp	4.714** (1.478) 1.676 - 7.752	0.629 (3.023) -5.585 - 6.842	6.143*** (1.411) 3.231 - 9.056
T1_CuiCohab	2.462* (1.189) 0.017 - 4.907	3.132 (2.471) -1.948 - 8.211	3.111* (1.398) 0.226 - 5.996
dist2	-0.304 (2.323) -5.080 - 4.472	4.370 (4.111) -4.081 - 12.820	-0.200 (2.140) -4.617 - 4.217
dist3	1.831 (1.403) -1.054 - 4.715	1.392 (2.172) -3.073 - 5.858	1.278 (1.510) -1.838 - 4.394
dist4	0.860 (1.296) -1.803 - 3.524	-0.429 (1.929) -4.395 - 3.536	-2.068 (1.545) -5.257 - 1.121
Constant	52.008*** (4.183) 43.410 - 60.607	53.907*** (4.355) 44.954 - 62.859	-5.887 (3.856) -13.846 - 2.071
Observations	136	138	92
R-squared	0.648	0.224	0.624

Note. ~ p<.10, * p<.05, ** p<.01, *** p<.001. Robust standard errors in parentheses.

Table C.11. Wave 3 full model impact results of Playgroups for Inclusion intervention in child temperament and behavior using ordinary least squares regression with correction of the standard errors for playgroup clustering.

VARIABLES	(1) Negative Affect (under 36mo) b/se/ci95	(2) Effortful Control (under 36mo) b/se/ci95	(3) Negative Affect (above 36mo) b/se/ci95	(4) Effortful Control (above 36mo) b/se/ci95
Fase	-0.070 (0.178) -0.435 - 0.295	0.086 (0.159) -0.240 - 0.412	-0.001 (0.188) -0.389 - 0.387	0.081 (0.204) -0.340 - 0.502
T1_CriIdadeMeses	0.013 (0.026) -0.041 - 0.066	0.023 (0.019) -0.017 - 0.063	0.019 (0.015) -0.013 - 0.050	0.026* (0.012) 0.001 - 0.051
CriFem	-0.005 (0.154) -0.321 - 0.310	0.242 (0.179) -0.125 - 0.609	0.353* (0.167) 0.008 - 0.698	0.166 (0.117) -0.077 - 0.409
T1_CuiEmpregado	-0.124 (0.234) -0.605 - 0.358	0.561* (0.250) 0.048 - 1.074	0.148 (0.185) -0.234 - 0.531	-0.137 (0.175) -0.500 - 0.226
T1_CuiEscolSecComp	-0.203 (0.288) -0.795 - 0.389	-0.401~ (0.227) -0.868 - 0.065	-1.115*** (0.198) -1.525 - -0.705	-0.203 (0.151) -0.516 - 0.110
T1_CuiCohab	-0.463* (0.221) -0.917 - -0.008	0.076 (0.353) -0.649 - 0.801	0.261 (0.353) -0.469 - 0.991	0.295 (0.304) -0.333 - 0.923
dist2	-0.217 (0.269) -0.770 - 0.335	0.071 (0.183) -0.305 - 0.447	0.406 (0.270) -0.152 - 0.964	-0.323 (0.250) -0.841 - 0.195
dist3	-0.324 (0.236) -0.809 - 0.161	-0.225 (0.267) -0.773 - 0.322	0.471 (0.342) -0.236 - 1.179	-0.126 (0.227) -0.596 - 0.345
dist4	-0.173 (0.199) -0.583 - 0.236	-0.230 (0.219) -0.680 - 0.220	0.141 (0.197) -0.266 - 0.548	-0.220 (0.144) -0.517 - 0.078
T1_CuiFem			0.489 (0.429) -0.398 - 1.377	0.182 (0.177) -0.183 - 0.547
Constant	4.319*** (0.292) 3.720 - 4.918	4.666*** (0.375) 3.894 - 5.438	3.657*** (0.593) 2.430 - 4.883	4.585*** (0.486) 3.580 - 5.590
Observations	71	71	76	76
R-squared	0.129	0.134	0.370	0.185

Note. ~ p<.10, * p<.05, ** p<.01, *** p<.001. Robust standard errors in parentheses.

Table C.12. Wave 4 full model impact results of Playgroups for Inclusion intervention in child temperament and behavior using ordinary least squares regression with correction of the standard errors for playgroup clustering.

VARIABLES	(1) Negative Affect (under 36mo)	(2) Effortful Control (under 36mo)	(3) Negative Affect (above 36mo)	(4) Effortful Control (above 36mo)
	b/se/ci95	b/se/ci95	b/se/ci95	b/se/ci95
Fase	0.230 (0.197) -0.180 - 0.640	-0.029 (0.289) -0.631 - 0.572	0.032 (0.174) -0.326 - 0.391	0.203 (0.124) -0.053 - 0.458
T1_CriIdadeMeses	-0.016 (0.038) -0.095 - 0.062	0.017 (0.029) -0.043 - 0.076	0.015 (0.012) -0.009 - 0.040	0.020* (0.009) 0.001 - 0.038
CriFem	0.428** (0.151) 0.115 - 0.741	0.524 (0.381) -0.268 - 1.316	0.300 (0.214) -0.141 - 0.741	0.406*** (0.102) 0.196 - 0.617
T1_CuiEmpregado	-0.645* (0.270) -1.207 - -0.083	0.473 (0.287) -0.124 - 1.070	-0.173 (0.203) -0.591 - 0.245	-0.007 (0.121) -0.257 - 0.243
T1_CuiEscolSecComp	-0.028 (0.245) -0.538 - 0.482	-0.510 (0.318) -1.172 - 0.151	-0.444* (0.210) -0.876 - -0.012	-0.299* (0.117) -0.541 - -0.058
T1_CuiCohab	-1.272** (0.339) -1.976 - -0.568	0.169 (0.360) -0.580 - 0.918	-0.143 (0.275) -0.708 - 0.423	0.206 (0.217) -0.240 - 0.653
dist2	0.228 (0.229) -0.248 - 0.704	-0.336 (0.324) -1.010 - 0.338	0.136 (0.232) -0.341 - 0.614	0.218 (0.206) -0.207 - 0.643
dist3	0.252 (0.259) -0.288 - 0.791	-0.034 (0.247) -0.546 - 0.479	0.063 (0.307) -0.570 - 0.696	0.356* (0.133) 0.083 - 0.629
dist4	-0.603* (0.250) -1.122 - -0.084	-0.441 (0.489) -1.458 - 0.576	0.182 (0.247) -0.327 - 0.691	-0.125 (0.129) -0.391 - 0.141
T1_CuiFem			0.317 (0.267) -0.232 - 0.867	0.375* (0.145) 0.077 - 0.673
Constant	4.901*** (0.380) 4.111 - 5.691	4.776*** (0.312) 4.128 - 5.425	4.017*** (0.497) 2.994 - 5.040	4.459*** (0.386) 3.665 - 5.254
Observations	39	39	101	101
R-squared	0.646	0.230	0.106	0.290

Note. ~ p<.10, * p<.05, ** p<.01, *** p<.001. Robust standard errors in parentheses.

APPENDIX D

Letter to the families

Caro pai/mãe/cuidador participante nos Grupos Aprender Brincar Crescer,

Em nome do Projeto Grupos Aprender, Brincar, Crescer (GABC), vimos felicitá-los por um ano de muito crescimento e felicidade junto da sua criança, e agradecer do fundo do coração a vossa participação. O vosso contributo foi imprescindível para a obtenção de dados muito importantes, que vão certamente proporcionar novas análises das políticas públicas em Portugal e demonstrar como este tipo de serviço para a 1ª infância poderá contribuir para ampliar o desenvolvimento da criança e os momentos de brincadeira em família.

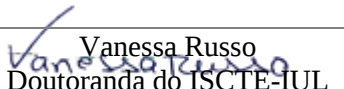
A presente carta tem como objetivo dar-vos a conhecer o aprofundamento da investigação nesta área, através de um estudo que contempla os projetos de doutoramento da Carla Colaço (carlacolac@gmail.com) e Vanessa Russo (vsfcc@iscte.pt), a ser realizados no ISCTE-IUL, instituição parceira do consórcio GABC. As doutorandas estão inseridas no Departamento de Psicologia Social e das Organizações do ISCTE – IUL, e são supervisionadas pelas Professoras Doutoradas Maria Clara Barata (MClaraBarata@fpce.uc.pt) e Joana Alexandre (Joana.Alexandre@iscte.pt).

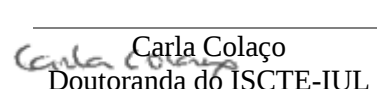
Este estudo tem como objetivo fazer o seguimento das experiências das famílias e crianças participantes nas dimensões estudadas anteriormente meio ano após o término da implementação do projeto. Além das dimensões anteriores, procuraremos também explorar como o projeto teve impacto no brincar e práticas de brincadeira de adultos e crianças.

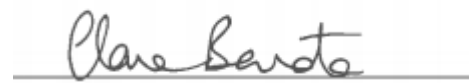
Este estudo só é possível mediante um novo encontro com a criança e o cuidador que acompanhou as atividades do projeto. À semelhança do que ocorreu nos anos anteriores, vamos levar a cabo algumas atividades com a criança e uma entrevista consigo ou com o cuidador que estava inscrito. Desta forma, vimos por este meio informar que serão contactados pelas doutorandas, no sentido de auscultar o vosso interesse e disponibilidade em colaborar no seu estudo. A sua possível participação neste estudo será ajustada à sua disponibilidade.

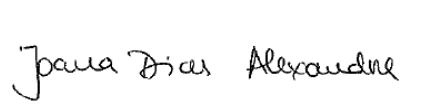
É nossa ambição poder avaliar rigorosamente e posteriormente oferecer e divulgar uma nova oferta educativa de infância de qualidade no futuro. Como tal, e para retribuir a sua colaboração, a todas as famílias que participarem neste estudo será oferecido um voucher de 5€ do continente (DA). Existirá também a possibilidade de solicitar um relatório sobre os resultados das atividades realizadas com a criança.

Estamos disponíveis para prestar esclarecimentos sobre os vários aspetos deste estudo através do número 210 934 640, do email segue.projetogabc@gmail.com ou da seguinte morada: Centro de Investigação e Intervenção Social, ISCTE- Instituto Universitário de Lisboa – Ed ISCTE-IUL, Sala 2w17: Avenida das Forças Armadas, 1649-026 Lisboa.


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APPENDIX E

Consent form

Impactos longitudinais dos Grupos Aprender Brincar Crescer: o papel da dosagem e da qualidade

A importância e desenvolvimento da brincadeira no contexto dos Grupos Aprender, Brincar, Crescer.

A presente investigação insere-se no âmbito de duas teses de doutoramento das doutorandas Vanessa Russo (vsfcc@iscte.pt) e Carla Colaço (cmcco1@iscte-iul.pt), desenvolvendo-se no Departamento de Psicologia Social e das Organizações do ISCTE – IUL, sob supervisão das Professoras Doutoras Maria Clara Barata e Joana Alexandre. Parte deste trabalho está a ser financiado por uma bolsa de doutoramento da Fundação para a Ciência e Tecnologia (PD/BD/128242/2016), e surge no seguimento do projeto-piloto Grupos Aprender, Brincar, Crescer (GABC)¹¹ financiado pela Comissão Europeia Programme for Employment and Social Solidarity - PROGRESS (2007-2013) (Grant agreement VS/2014/0418). Este trabalho é acolhido pelo Centro de Investigação e Intervenção Social (CIS-IUL). Pretendemos dar continuação ao projeto-piloto, avaliando se os GABC tiveram um impacto a longo prazo nas famílias e crianças, na qualidade do ambiente familiar e nas práticas parentais, nas atitudes e expectativas em relação à educação, no desenvolvimento infantil, no temperamento e comportamento da criança e, na participação socioprofissional e comunitária. Além das dimensões anteriores, procuraremos também explorar como o projeto teve impacto no brincar e práticas de brincadeira de adultos e crianças.

Porque fui selecionado(a)?

Para a presente investigação, foram selecionadas as famílias que participaram no projeto-piloto GABC nos distritos do Porto, Aveiro, Coimbra e Lisboa no período de outubro 2017 a novembro 2016.

Em que consiste a minha participação?

À semelhança da sua participação no projeto-piloto GABC, o presente estudo realiza-se na casa onde a criança reside, ou noutro espaço de conforto para os pais/cuidadores e criança, sem intenção de alteração da rotina familiar. A participação no estudo inclui dois momentos de avaliação: o primeiro ocorre entre abril e junho de 2017; o segundo ocorre entre outubro e dezembro de 2017. Em cada momento, os investigadores irão fazer algumas observações, bem como entrevistar o cuidador da criança (ex. mãe, pai, avó). Estima-se que a avaliação tenha a duração de aproximadamente 1 hora e 30 minutos.

A avaliação não tem quaisquer custos e é constituída pelos seguintes elementos:

¹¹ Projeto promovido pela Direção-Geral da Educação (DGE) do Ministério da Educação e Ciência, Fundação Bissaya-Barreto, Universidade de Coimbra, ISCTE-IUL, Fundação Calouste Gulbenkian, e o Alto Comissariado para as Migrações (ACM, IP). Este projeto recebeu aprovação da CNPD (números 8312/2015 e 16381/2015) relativos à avaliação de impacto e de monitorização da implementação do projeto, respetivamente. O consórcio do projeto-piloto Grupos Aprender, Brincar, Crescer (GABC) aprovou formalmente este projeto de doutoramento.

- Avaliação do nível de desenvolvimento infantil - social e cognitivo – da criança;
- Avaliação da qualidade do ambiente familiar, práticas de cuidado, e atitudes e expectativas em relação à educação do cuidador.
- Avaliação da inserção socioprofissional do cuidador;
- Avaliação da participação comunitária do cuidador.
- Observação da brincadeira da criança, sendo esta convidada a brincar.
- Observação da brincadeira do cuidador/adulto
- Uma curta entrevista sobre as rotinas de brincadeira da criança

Os dados obtidos durante a avaliação serão apenas acedidos pelos investigadores envolvidos no estudo, sendo os resultados a publicar ou divulgar em formato grupal e sempre anónimos e confidenciais. Os resultados individuais da avaliação não serão partilhados com as entidades participantes.

A participação da sua família é voluntária. Caso decida participar disponibilizaremos um voucher de 5€ que vos permita comprar algo para si próprio ou para as crianças (roupa, brinquedos, comida). Tanto você, como o cuidador participante (caso não seja o representante legal) e a criança sob o seu cuidado podem decidir deixar de participar neste estudo em qualquer altura. Se algum elemento da família (ou cuidador que não seja um elemento da família) decidir deixar de participar neste estudo, os seus dados recolhidos serão automaticamente destruídos.

Todas as famílias poderão ter acesso a um relatório sumário com a informação recolhida sobre a sua família e criança. A disponibilização desta informação será sempre realizada mediante solicitação escrita por parte dos representantes legais da criança à equipa responsável. Para este fim ou qualquer outro esclarecimento poderão contactar-nos através de segue.projetogabc@gmail.com, telefone 916523530 (10h00 – 13h00; 14h30-18h00), ou na seguinte morada: Avenida das Forças Armadas, Ed. ISCTE, sala 2w17, 1649-026, Lisboa.

Assine a folha seguinte por favor

AUTORIZAÇÃO DO REPRESENTANTE LEGAL

Eu, mãe/pai/outro cuidador (circular o adequado), enquanto representante legal da criança declaro que tive conhecimento dos objetivos e procedimentos dos estudos das doutorandas Vanessa Russo e Carla Colaço e que desejo participar e autorizo a criança referida a participar.

Assinatura _____ Data _____

BI: _____

AUTORIZAÇÃO DO CUIDADOR (caso não seja o representante legal)

Eu,, enquanto cuidador da criança declaro que tive conhecimento dos objetivos e procedimentos dos estudos das doutorandas Vanessa Russo e Carla Colaço e que desejo participar e autorizo a criança referida a participar.

Assinatura _____ Data _____

BI: _____