Playworlds and Executive Functions in Children:
Theorising with the Cultural-Historical Analytical Lenses

Marilyn Fleer¹ · Nikolai Veresov¹ · Sue Walker²

Published online: 14 June 2019
© Springer Science+Business Media, LLC, part of Springer Nature 2019

Abstract
This paper provides a theorisation of developmental conditions to support executive functions (working memory, inhibition and shifting) in children in playworlds settings, where children and teachers play together in collectively created imaginary situations. Vygotsky’s general law of development of psychological functions constitutes the general frame for the analysis of the process of development of executive functions (EF) in playworlds, and the theoretical concepts of drama, social situation of development and perezhivanie are used as analytical tools to examine opportunities of playworlds to support children executive functions.

Keywords Executive functions · Cultural-historical theory · Playworlds · Drama · Social situation of development · Perezhivanie

Introduction
Over the past 20 years there has been an increasing emphasis on instructional academic activities that prepare young children for school (Dockett and Perry 2007; Margetts 2007). Even though play is widely seen as developmentally beneficial for young children, the major trend in public education in industrialized countries has been to focus on teaching specific academic skills and preparing children for state-wide testing (Gill et al. 2006).
As a result, play has been marginalised in preschool curricula. We would agree with Baumer (2013) that in many Western countries, young children’s life and play has become “segregated” into specifically designated areas such as nursery rooms, playgrounds, and theme-parks, since educators and parents often believe that children’s play needs to be spontaneous and free from adults’ guidance and influence. In contrast to this trend, play pedagogy advocates adult and child joint play, in which adults provide a variety of resources to enrich and support children’s development in play. Play pedagogy considers play to be a vital activity in early childhood and places it in the core of preschool and early elementary school curricula. The conception and practice of playworlds, introduced by Gunilla Lindqvist (1995) in Sweden and carried on by scholars elsewhere (Nilsson 2009), is a brilliant example of play pedagogy in action.

Although the literature shows an increasing number of research studies theorising the potential of playworlds there is much less known about what teachers can do in playworlds to support the development of executive functions in young children (Ferholt 2010, 2015). Drawing upon a pilot study by the authors (Fleer et al. 2017a, 2017b), this paper provides a theoretical analysis of the key components of playworlds and the opportunities they create to support the improvement of executive functions in children. The first section of the paper presents a brief overview of the literature on the role of play in developing executive functions in children and describes the key features of playworlds. This is followed by a section on the theorisation of conditions teachers might create to provide opportunities for the development of executive functions in playworlds. Vygotsky’s general law of development of psychological functions constitutes the general frame for the analysis, and the theoretical concepts of drama, the social situation of development and perezhivanie are used as analytical tools to examine playworlds specifically in relation to the conditions which support the development of executive functions in children.

**Play and the Development of Executive Functions in Young Children**

The literature defines executive functions (EFs) as a highly complex set of cognitive abilities (Bascandziev et al. 2016). Despite the growing body of research in this area, (Brocki and Bohlin 2004; Lehto et al. 2003; Martin and Failows 2010; Perner et al. 2002; Zelazo et al. 2003; Zelazo and Müller 2010) there is no consensus between researchers. For instance, EF has been generally described as “an ill-defined but important construct that refers generally to the psychological processes involved in the conscious control of thought and action” (Zelazo and Müller 2010, p. 574). Hughes and Graham (2002) define EF as “an umbrella term for all of the complex set of cognitive processes that underlie flexible goal-directed responses to novel or difficult situations” (p. 131), which “unlike other psychological processes (e.g., reading or face recognition) … has only a theoretical, and not an operational definition” (p. 139). However, Röthlisberger et al. (2012) claim that “most researchers would agree on the notion of EFs encompassing a variety of higher-order cognitive processes controlling and modulating cognition under continuously changing and multiple task demands” (p.412).

Although the overall landscape of research into EF remains complex and multidimensional, three general theoretical frameworks might be acknowledged. First, in contemporary research, the development of EF in the early years is studied as directly linked to the maturation and functioning of certain areas in the brain (Hughes 1998;
Bialystok and Martin 2003; Deák 2000; Denckla and Reiss 1997; Perner et al. 2002; O’Sullivan et al. 2001; Zelazo et al. 1997). The second approach conceives EFs as emerging from the interplay of biological, cultural, and social factors that are inherently irreducible to one another. EFs, according to Fernyhough (2010), are mediated by both neural activity and thought/language in sociocultural contexts. As Hammond et al. (2010) summarise, “EFs can be defined as responses to the social environment. Thus, the social environment defines the behavioral functional abilities that definitionally are called EFs” (p. 5). Another way of conceptualising the role of social interactions to support the development of EF can be found in the theoretical tradition of Vygotsky/Luria. EF is inherently social, and context embedded (Subbotsky 2016). In everyday life, “before children are able to self-regulate their behaviors, they gain control through “other regulation,” whereby their behavior is guided by others as they learn to initiate desired behaviors (Bodrova and Leong 2006). Psychological processes such as self-regulation are developed through interactions with adults, peers, and the learning context (Stetsenko and Vianna 2009). In our study we follow this theoretical framework looking at the opportunities for the development of EF in young children in specially created play-based environments (playworlds).

In this study, we refer to elements of EF such as:

1. working memory, which refers to a child’s ability to store, update and retrieve information whilst simultaneously doing other things (Baddeley 2006; Packiam Alloway 2018; Röthlisberger et al. 2012);
2. inhibition (or inhibitory control), which involves the ability to self-regulate and not respond immediately but to withhold a response in favour of another action (Diamond 2013), and
3. cognitive flexibility (also known as shifting), which refers to the ability to shift attention to a different task or change a response/action in relation to changes in the environment (Blair 2016; Davidson et al. 2006; Garon et al. 2008).

These three EFs were the focus of this study as they have been found to predict both early and long-term academic success (Alexander et al. 1993; Blair 2002; Bodrova and Leong 2006; Bull and Scerif 2001; McClelland et al. 2006, 2007, 2013).

A large body of research confirms that early childhood is a crucial time for laying the foundations of EF (Berk and Meyers 2013; Welsh 2002; Welsh et al. 2008 among many others). Between the ages of two and six, “typically developing children make impressive strides in focusing attention, inhibiting inappropriate responses, planning sequences of actions, and thinking flexibly” (Berk and Meyers 2013, p. 98). When children build their capacity to think flexibly, remember, focus, self-regulate and make plans, they increase their ability to solve problems, make decisions, persist at tasks, recognise and correct mistakes, control impulsive behaviour, as well as set goals and work towards them. These skills will help them meet the challenges they will face at school.

Beginning from the pioneer studies of Singer (1961) and Manuilenko (1975), the research on the relationship between play and the development of EFs in the early years has increasingly grown over time. For example, researchers have noted positive correlations between levels of play and EF (Berk et al. 2006; Bodrova et al. 2013; Kelly et al. 2011). Thus, Elias and Berk (2002) found that complex sociodramatic play predicted increases in on-task behaviour. Kelly et al. (2011) reported that four-
seven-year-olds’ symbolic play in a structured laboratory setting was associated with inhibitory control. Berk and Meyers (2013) suggest that “make-believe play is a potentially important causal factor in EF development” (p. 103). Becker et al. (2014) reported that higher levels of active play were associated with better self-regulation, which in turn was associated with higher scores on early reading and math assessments. Taken together, these studies along with many others suggest that studying play is a fruitful approach to better understanding the development of EF in early childhood.

**Playworlds and Opportunities for Development of EF**

Our study drew upon a model of play known as playworlds, introduced by Gunilla Lindqvist (1995, 1996, 2001, 2003) and rooted in Vygotsky’s (Vygotsky 2016) conception of play. Generally, playworlds is an educational practice that includes adult-child dramatization of texts from children’s literature through involving children in joint play. Lindqvist (1995) said, “When using playworlds as a concept, I mean the fictitious world (context) which children and adults come to share …”, where they “interpret and dramatize the theme …” (Lindqvist 1995, p. 70: original emphasis).

This conception was developed further by other researchers (Hakkarainen et al. 2013; Ferholt and Lecusay 2010; Fleer 2014, 2017; Hakkarainen 2006, 2010; Ferholt 2010; Marjanovic-Shane et al. 2011). Hakkarainen (2008) defines playworld as “an imaginative activity shared jointly by children and adults” (pp. 292–293). According to Hakkarainen (2006) the pedagogy of playworlds is framed through the telling or reading of a story and the children and the teacher work together to create the playworlds and play narrative. However, the play evolves through the introduction of new elements where the teacher and children elaborate the basic theme or plot, constructing scenes and enacting specific roles where they “agree jointly to imagined particular settings and props” (p. 210). The unique feature of playworlds is that realistic problems can be embedded into a story line.

What is theoretically important for this study is that the concept of playworlds advances Vygotsky’s concept of play. In his foundational paper on play (Vygotsky 2016), Vygotsky did not talk about adult-child play as such, whereas the conceptualisation of playworlds moves the theorising of play forward by highlighting the importance of an adult in the play interaction. “Dramatizing stories and taking roles motivates adults to step in a joint play-world and take a role, which in turn wakes up the adult’s own imagination… It changes the adult-child relationship and ‘switches’ adult thinking from rational to narrative” (Hakkarainen et al. 2013, p. 223). In contrast to the existing trend that children’s play has to be spontaneous and free from adults’ guidance and influence, this approach advocates that adults and children engage in joint play within collectively created imaginary worlds in order to support children’s development. In addition to advancing the theorisation of play, the concept of playworlds is also important for this study as its key features can be theorized in relation to opportunities for the development of EF in children.

In practice, playworlds might look different in different contexts depending on the book or story selected for dramatization, the motivation of children and adults, the plot, roles, rules, characters and other factors. However, playworlds contain several distinguishing key features. The first key feature of playworlds is crossing a border.
Entering into playworlds, where new rules and roles are enacted, and where dramatic events are experienced, children must cross a border of some kind to signal they are collectively in the imaginary situation (Lindqvist 2003). Lindqvist (1995) gives the example of entering into a basket and riding in a hot air balloon into other lands to go on journeys. Fleer (2017) introduced a chair as the border following the narrative of Enid Blyton's Magic Wishing Chair, in which children go on adventures.

The second feature of playworlds is that they are collectively created imaginary situations where the teacher takes on a character in the play. In their research, Hakkarainen et al. (2013) show that in playworlds teachers work with young children to support the development of ongoing play, and also to present and model higher forms of play. Teachers, who are inside the imaginary situation in play with children, can sensitively expand the play, pose new problems, support the development of solutions and generate new adventures.

The third distinguishing characteristic of playworlds is the need for dramatic events - ones that are exciting and motivating for children. In playworlds, dramatic collisions refer to exciting, engaging or contradictory moments in imaginary situations, where children and teachers are emotionally involved. Drama creates particular conditions that can activate children into action as well as into imagining solutions to pending problems and creating collective moments of reflection in the play. Drama can also create conditions to support the development of the playworlds, which in turn has been shown to support children’s development (Lindqvist 1995).

Because of their unique features we consider playworlds as ideal settings to create specific conditions for the development of EF.

The pilot study conducted by the authors (Fleer et al. 2017a) showed that a variety of EF tasks could be successfully embedded by teachers into playworlds they collectively created. Thus, development of shifting might be supported by creating new rules in the playworlds, such as children walking backwards, or inviting the children to devise new passwords and then changing these. Playworlds also create opportunities for the development of inhibition, when children are required to follow certain rules that are counterintuitive, such as ‘up being down’ and ‘down being up’. Under these conditions, children’s initial responses would need to be inhibited if they are to perform in relation to the new rules. Further, playworlds create opportunities for the development of working memory, because children have to recall play narratives and be in character when responding to problem situations - such as solving a problem from the perspective of the wolf when playing the fairy tale of the Three Little Pigs (more details in Fleer et al. 2017a, p. 49; 2017b, p. 4). In the following section, we discuss how these opportunities could be further theorised for a better understanding of the potential of playworlds to support the development of EF in children.

**Theorisation of Conditions to Support EF in Playworlds**

The pilot study conducted by authors (Fleer et al. 2017a, b) theorised EF as imbedded in a cultural activity, where the environment acts as the source of development of specifically human characteristics. This is in line with Vygotsky’s approach to the development of self-control and voluntary direction of one’s own actions which develop in the process of children’s group games with rules (Vygotsky 1998):
The child who learns to conform and coordinate his actions with the actions of others, who learns to modify direct impulse and to subordinate his activity to one rule or another of the game, does this initially as a member of a small group within the whole group of playing children. Subordination to the rule, modification of direct impulses, coordination of personal and group actions initially, ...is a form of behavior that appears among children and only later becomes an individual form of behavior of the child himself (p.169).

The pilot study argues that a conception of EF as a social practice is a more pedagogically productive way of creating the conditions to support children’s development. EF as understood through teacher practice, can be re-conceptualized as a form of social practice within a system of referential relations, rather than as functions per se (Fleer et al. 2017a, p. 10). At the same time, the pilot study findings allowed us to identify how playworlds could create opportunities for the development of EF.

However, opportunities do not automatically bring results in development until they are “converted” into real actions which utilise these opportunities. The findings of a pilot study allowed possibilities for 1) further theorisation of key components of playworlds as conditions for the development of EF; 2) better understanding of how teachers could use playworlds to support the development of EF in children, or in other words, how opportunities can be turned into the psychological conditions for development of EF in playworlds. In this section, we focus on these aspects.

We begin with brief outline of existing theorisations in playworlds literature, followed by a theorisation of developmental conditions with the cultural-historical theoretical concepts of drama, the social situation of development (SSD) and perezhivanie, in order to better understand the developmental potential of playworlds which might help teachers in finding new and more effective use of these opportunities through the concrete playworlds they create with children.

Playworlds might be theorised from different perspectives. However, since playworlds originate from the cultural-historical conception of play, we consider cultural-historical concepts to be the most relevant tools of theorisation of playworlds’ developmental potential. In order to do this, we draw upon previous cultural-historical research on play as a source of development of EF in children. Thus, Bodrova et al. (2011) claim that play affects a child’s self-regulation “through shared behaviors that result in internalized higher mental functions, and the development of self-regulation in play becomes possible because of the inherent relations that exist between roles children play and rules they need to follow when playing the roles” (p. 18). Using cultural-historical concepts to theorise the developmental potential of playworlds we agree with Bodrova et al. that “children’s self-regulatory abilities originate in social interactions and only later become internalised and independently used by children” (Bodrova et al. 2011, p. 18). This theoretical approach follows Vygotsky’s general theoretical idea of development as a dialectical process, a “path along which the social becomes the individual” (Vygotsky 1998, p. 198). Social interactions, therefore, are considered not as factors in development, but as a source of development (Vygotsky 1998, p. 203). In our analysis we consider playworlds as a unique space of social interaction, the social plane of development from which self-regulatory abilities originate.

Theorising developmental conditions to support EF in playworlds, we also draw upon findings from previous research that a necessary condition for the emergence of
self-regulation is children’s learning of the specific cultural tools that would allow them to eventually use self-regulatory behaviors independently (Bodrova et al. 2011). This is important as playworlds usually contain a variety of specific cultural tools related to the roles the participants play (including costumes, masks, etc.), and to the story-line they build together within the collectively created imaginary situations (for example, magic maps, rules, passwords, signs, etc.), which can be effectively used as tools to support the development of EF.

In our study, the framework for theorising the developmental conditions to support EF is the general law of cultural development. According to this law (Vygotsky 1997) “a psychological function appears twice, first on a social plane, between the people (inter-psychological), and then within the child (intra-psychological)” (p. 106). Every individual psychological function originally exists on the social plane, as the inter-psychological dimension of real relations between people, or as Vygotsky puts this: “… every higher mental function was external because it was social before it became an internal strictly mental function; it was formerly a social relation between two people” (Vygotsky 1997, p. 106). What is important is that social (inter-psychological) and individual (intra-psychological) planes of development are not levels or stages which replace each other; they are two coexisting and dialectically related planes of one scene (stage) of development, similar to the foreground and the background of a scene on the stage of a theatre. The dialectical relation between these two planes is a process of transformation of the psychological functions from the social plane to the individual. But, in Vygotsky’s words, the ‘entire nature’ of these higher mental functions is social: “even in being transformed into mental processes they remain quasisocial” (Vygotsky 1997, p. 106).

We begin with the theorisation of two key components of playworlds - dramatization and an imaginary situation - as key components of a unique culturally constructed social (inter-psychological) plane of development, focusing on the conditions it might provide to support EF. For this we apply the concepts of drama and the social situation of development as analytical tools. Then, with the help of the concept of perezhivanie, we examine playworlds from the aspect of transition from the social (inter-psychological) plane to the individual (intra-psychological) plane of EF, with the focus on the active position of the child. This leads to a better understanding of how the developmental potential of playworlds could be actualised by embedding EF tasks into a playworlds setting. We consider that the general law of development allows us to build a complex general frame for the analysis of the process of development of EF in playworlds, and the theoretical concepts provide the opportunity to examine key traits of playworlds specifically in relation to the developmental conditions for EF.

Theorising the Social (Inter-Psychological) Plane of Development of EF in Playworlds

Dramatization in Playworlds and the Developmental Conditions to Support EF

The cultural-historical concept of drama might be a powerful tool for theorising the developmental conditions for EF in playworlds for two reasons. First, as was discussed in the previous section, dramatic events and dramatization are distinguishing characteristics of playworlds where adults play a key role. Lindqvist (1996) highlights this by saying that “the adults needed to dramatize the action in order to provide play
with a meaning. The characters played by the pedagogues were of particular importance in bringing the play to life because they created a dialogue between the adults and the children which opened the door to the fictitious world. The pedagogues became mediators” (p. 10). In order to make playworlds successful, adults need to take on and play a role, to dramatize and to create a dialogue. However, this does not mean that the adult’s role is a leading one. Children are active creators and participants in imaginary situations and might take the leading role. Drama therefore is not only a necessary component of playworlds, but also might be considered as a fundamental condition for the existence and development of the playworld itself.

The second reason which makes the concept of drama a powerful analytical tool comes from the theoretical domain. In cultural-historical theory, the concept of drama contains two theoretical aspects. The first is that drama begins with a collision, a conflict, a contradiction, a critical moment which happens in a form of an event, where participants are not outside objective observers (like spectators in the theatre), but remain personally and emotionally involved in drama until the collision is resolved. This aspect of dramatic events in playworlds was theorised by Hakkarainen (2010) in relation to development of reflection in children:

“Dramatic collisions of tales and stories raise children’s questions and are starting points of joint reflection (Why Kai became mean after getting a piece of mirror in his eye [Snow Queen]). Changing or adding dramatic events from other stories causes more collisions and helps in inventing dilemmas, which should be solved realistically before the story continues (Shipwreck stopped captain Hook’s voyage and children are asked to help him building (planning) a new ship)” (p. 79).

The second important theoretical aspect of the concept of drama lies in its relations to the general law of cultural development. The social, inter-psychological form of existence of a child’s psychological functions was conceptualized by Vygotsky as a drama that was at the same time both intra-psychologically (individually) interpreted by the child, and experienced by the child inter-psychologically (Vygotsky 1989, p. 69), resulting in the development of the child (Veresov and Fleer 2016). A dramatic event or collision, which occurs on the social plane is, therefore, a condition for the development of individual functions in children, or as Vygotsky put this:

“The basic principle of the functioning of higher functions… is social, entailing interaction of functions, in place of interaction between people. They can be most fully developed in the form of drama” (Vygotsky 1989, p. 59).

When in playworlds, the teacher being in role, creates dramatic collisions and supports children in searching, creating and using tools and means to resolve them, the teacher, in fact, creates the social plane of the existence of mental functions. When a teacher includes EF tasks into the dramatic event, the teacher creates an inter-psychological plane for the development of individual EF.

The concept of drama is also important to theorise the structure of dramatization in playworlds in relation to the development of EF. Quite often, dramatization in playworlds includes two stages – (1) a dramatic collision, followed by (2) collective activities within the imaginary situation leading to the resolution of the collision.
(Hakkarainen 2010; Lindqvist 1995). Each of these stages provides various opportunities for development of EF. By creating a dramatic collision, the teacher builds a social (inter-psychological) plane of development of EF. By embedding EF tasks into the second stage, the teacher not only makes them meaningful for children according to the playworlds requirements, but creates the opportunity for the development of EF to support children’s transition from the “inter-psychological” to the “intra-psychological” plane of development. The following playworlds episode is an example of using drama opportunities to create conditions for the development of EF:

Teacher and children find the bottle with the letter and the map from Captain Hook. The letter says he is captured by pirates and asks for the help. The way to the pirate island is drawn on the map. However, the pirates have a secret which Captain Hook does not know – the only way to get to the island and remain invisible for pirates is to follow the “opposite direction rule” (ODR), which is to move in opposite direction to the directions drawn on the map. Teacher and children take roles (rescue team members, Captain Hook, pirates), then enter the playworlds area through the border to find and liberate Captain Hook. On their journey, the rescue team move in a way opposite to the map directions (turn left instead of right, and forward instead of back). They reach the pirates island – helping each other in following rules and remaining invisible to the pirates – liberate Captain Hook and return home together, following the same rules to remain hidden from the pirates’ chase.

Here, at stage one (dramatic collision) the teacher creates the “inter-psychological” plane of EF through the letter and the map as cultural tools. At stage two (journey to the pirates’ island following ODR and returning back), the teacher creates the conditions for the transition of EF (working memory, shifting and inhibition in this scenario) from the “inter-psychological” to the “intra-psychological” plane of development where the map “works” as an external cultural tool for self-control and regulation. After several journeys, children would be able to follow the rules with less support from the teacher and other children, which signifies the transition from regulation through others (inter-psychological plane) to self-regulation (intra-psychological plane). By doing this, the teacher uses the opportunities of playworlds to support the development EF in children. The cultural-historical concept of drama, thus, not only allows better understanding of the potential of playworlds in relation to the development of EF, but might help teachers to enrich and improve the playworlds they collectively create to utilise this potential for the more effective support of the development of EF in children.

**Imaginary Situations of Playworlds and the Social Situation of Development of EF**

In this section, we theoretically examine collectively created imaginary situations as one of key components of playworlds (Hakkarainen 2010; Lindqvist 1995). We theorise an imaginary situation as a component of the social (inter-psychological) plane of development of executive functions. Here we focus on the developmental conditions to support EF and use the concept of the social situation of development (SSD) as an analytical tool.
We consider this concept to be the most suitable and powerful analytical tool, as in cultural-historical theory SSD is defined as “a completely original, exclusive and unique relation between the child and social reality” (Vygotsky 1998, p. 198). In playworlds, collectively created imaginary situations are examples of unique, original and exclusive relations of participants, shaped and framed by roles, rules and collective actions which exist and develop only within the imaginary situations. What also makes SSD a strong analytical tool is that it “represents the initial moment of all dynamic changes that occur in development and… determines forms and the path along which the child will acquire ever newer personality characteristics” (Vygotsky 1998, p. 198).

In other words, the concept of SSD allows us to examine theoretically these collectively-created imaginary situations as components of the social (inter-psychological) plane of development of executive functions in children. In our analysis, we draw upon previous studies of SSD as a theoretical tool for investigating the process of development in child’s play (for example, Bodrova et al. 2013; Vadeboncoeur et al. 2016). However, there is to date no research exploring imaginary situations in playworlds as specific social situations for the development of EF.

The concept of SSD was introduced in relation to the problem of psychological age (Vygotsky 1998, pp. 187–297). Looking closely, we can identify the key characteristics of SSD:

1. it is socially constructed as it is a social situation;
2. it appears as a unique relation between the child and the social environment, during the first stage of each psychological age which is the stage of crisis experienced as a series of dramatic events:
3. it is characterized by special types of perezhivanie (explained further below);
4. it creates the developmental conditions which might bring positive or destructive outcomes depending on how the crisis is resolved.

Collectively created imaginary situations in playworlds contain the same characteristics: (1) they are socially constructed, collectively created imaginary situations; (2) they include dramatic events, which is a key characteristic of playworlds; (3) they create the developmental conditions (inter-psychological plane) for the psychological functions of a child and through this they might significantly contribute to the child’s development and (4) they are characterized by a special type of perezhivanie. This makes it possible to apply the concept of SSD to the analysis of the “inter-psychological” plane of development in playworlds.

The findings from a pilot study (Fleer et al. 2017a, 2017b) show that even though they may be in the same collectively created imaginary situations, children look at the situation in different ways. It might seem obvious that in playing different roles the participants should have different visions, motives, emotions and desires. For example, the journey to rescue Captain Hook viewed through the eyes of pirates looks different from when it is viewed by the participants of the rescue team. However, even being in similar roles, children act differently so that it becomes impossible to distinguish exactly what in a child’s actions is determined by her role and what is related to her

---

1 The concept of perezhivanie will be presented in the following section as a concept of analysis of the “intra-psychological” plane of development of EF in playworlds.
personal characteristics. These empirical findings demonstrate that different aspects or components of an imaginary situation affect children in different ways. This allows us to assume that an imaginary situation is not equal to a SSD, but rather contains various micro-SSDs. There is something which makes each imaginary situation a social situation for the development of EF and creates a link between the “inter-psychological” and the “intra-psychological” planes of development. We assume this “something” is the child’s perezhivanie which we discuss in the following section.

**Theorising the Individual (Intra-Psychological) Plane of Development of EF in Playworlds: Perezhivanie**

The concept of perezhivanie was first introduced by Vygotsky (1994) and recognised as being difficult to translate (Mok 2017; Veresov and Fleer 2016). Consequently, the term has increasingly been referenced in Russian. Recently, several theoretical and empirical studies have been published on perezhivanie in early childhood development and education (Antoniadou 2001; Brennan 2014; Chen 2015; Fleer and Hammer 2013; Quiñones and Fleer 2011; Veresov and Fleer 2016). However, until now there has been limited research on perezhivanie in playworlds (Ferholt 2009, 2010). We begin this section with a brief introduction of perezhivanie followed by discussion of possible ways of theorising perezhivanie in relation to playworlds and opportunities to support the development of EF.

Perezhivanie has been conceptualised as both a phenomenon and a concept (Fleer 2016; Veresov 2017; Veresov and Fleer 2016). In this section we discuss both aspects.

**Perezhivanie** as a psychological phenomenon is about “how a child becomes aware of, interprets, and emotionally relates to a certain event” (Vygotsky 1994, pp. 340–341). What makes this phenomenon interesting is that, on the one hand, it comprises children’s emotional reactions and responses, which makes it easy to observe in playworlds settings. In relation to the role of an adult, Hakkarainen et al. (2013) have argued that “dramatizing stories and taking roles motivates adults to step in a joint playworld and take a role, which in turn wakes up the adult’s own imagination, helps emotional involvement, and perezhivanie” (p. 223). The research of Ferholt (2009, 2010, 2015) was focused on studying children’s perezhivanie as an observable phenomenon of emotional reactions in playworld settings. However, perezhivanie as a phenomenon is more than emotional reaction—it is an integral complex nexus of various psychological functions (including perception, memory, thinking, volition and imagination) (Veresov and Fleer 2016). Emotions are components of the complex phenomenon of perezhivanie and, at the same time, they are easily observable indicators of the perezhivanie of a child.

In contrast to perezhivanie as a phenomenon which allows study of how a social event might affect the child, perezhivanie as a theoretical concept acts as an analytical tool which “allows us to study the role and influence of environment on the psychological development of children” (Vygotsky 1994, p. 343, more on this in Veresov and Fleer 2016). In other words, the theoretical concept of perezhivanie allows us to study how the social environment might bring changes to the trajectory of the development of psychological functions in children (Fleer et al. 2017). This makes the concept of perezhivanie a powerful tool for studying the developmental conditions of playworlds which support EF.
We begin our theorization with two references from Vygotsky which are important for our goal.

“Perezhivanie, arising from any situation or from any aspect of his environment, determines what kind of influence this situation or this environment will have on the child. Therefore, it is not any of the factors in themselves (if taken without reference to the child) which determines how they will influence the future course of his development, but the same factors refracted through the prism of the child's perezhivanie” (Vygotsky 1994, pp. 339-340).

“…only those components of the social environment that are refracted by the perezhivanie of the individual achieve developmental significance” (Vygotsky 1998, p. 294).

The concept of perezhivanie as a refracting prism supports better understanding of the conditions which support EF in playworlds in two ways. First, it highlights the active role of the child who, being a participant in an imaginary situation in a playworld, perceives, interprets, understands and reacts in an individual and unique way. The transition and transformation of a psychological function from the “inter-psychological” plane to the “intra-psychological” plane is not a direct transition, it is a complex process of internalisation which goes through perezhivanie as a refracting prism.

Second, this concept allows us to advance our understanding of opportunities and developmental conditions. Developmental conditions do not work in themselves, rather they are potential opportunities until the child refracts them through perezhivanie. Paraphrasing Vygotsky’s quotation, we could claim that it is not any of the developmental conditions in themselves (if taken without reference to the child) which determine how they influence the course of development of EF in child, but those conditions refracted through the prism of the child’s perezhivanie. This is in line with the cultural-historical understanding of the social environment as a source of development from which the “child will acquire ever newer personality characteristics, drawing them from the social reality” (Vygotsky 1998 p. 198). The source does not determine the process, it becomes a resource when the child begins to draw from it.

Vygotsky’s case study of three children from the same family, experiencing dramatic times and demonstrating different developmental consequences (Vygotsky 1994) gives us a classic example of how the social drama might be theorized through the concept of perezhivanie. The result of analysis is presented in the following conclusion:

“…Each of the children experienced the situation in a different way. So … depending on the fact that the same situation had been experienced by the three

---

2 ‘Source’ here is not a metaphor, such as the source of a river from which the water flows naturally, but rather a well to take water from.
3 Vygotsky uses the word черпать (to scoop) in Russian original text, like scooping water from the well.
4 In the original Russian text the verb perezhival (переживал) is used. This is the past singular grammatical form of the verb perezhivat’ (переживать), from which the noun perezhivanie has been derived.
children in three different ways,\(^5\) the influence which this situation exerted on their development also turns out to be different” (Vygotsky 1994, p. 341).

Following this example of theorisation, Veresov and Fleer (2016) suggested a special kind of perezhivanie – the dramatic perezhivanie (child’s individual refraction of certain dramatic event) – as a concept which creates the opportunity to theorise the developmental conditions of dramatic social situations. Because of the dramatic nature of playworlds, we consider the concept of dramatic perezhivanie an appropriate theoretical instrument.

Playworlds are worlds of imaginary situations. Taking and playing different roles within the playworlds, children perceive, interpret and emotionally relate to the same imaginary situation differently; for example, both the rescue team and the pirates should follow the opposite direction rule, however, with different purposes. The rescue team members try to remain invisible to the pirates, whereas the pirates try to detect those who do not follow the rule and therefore make themselves visible. If, after the journey, the teacher could ask children to make a drawing of what happened during the rescue expedition, it might provide valuable data on which particular aspects, events (or episode/s) of a journey were refracted through children’s perezhivanie and which aspects were not. This, in turn, would help to identify which of the created developmental conditions did work and which of them did not. This would help to improve the playworlds environment by embedding EF tasks in order to better support the development of EF and to maximise the developmental potential of imaginary situations in playworlds.

**Summary and Avenues for Further Research**

This paper contributes to the cultural-historical theocratisation of the role of play in the development of EF in children. Our research is focused on the analysis of playworlds which are ideal vehicles for providing unique opportunities for the development of EF. Following our pilot study, which showed that EF in children can be understood as a social activity (Fleer et al. 2017a) and that teachers could embed EF tasks into playworlds they collectively create with children (Fleer et al. 2017b), we theorise the key components of playworlds for better understanding of the opportunities of playworlds to support the development of EF in children. We believe that theorising the developmental conditions which support EF in playworlds will lead to better understanding of their developmental potential. However, theorisation means almost nothing if it does not lead to changes in practice. Deeper understanding of these opportunities as real (and potential) conditions for EF might be fruitful for educators, in finding new and more effective use of these opportunities through the concrete playworlds they create with children. On the other hand, this study allows several new avenues of research to be generated.

\(^5\) In the Russian original text «у троих детей возникло три разных переживания одной и той же ситуации» (three different perezhivanie of the same situation appeared in three children) (Vygotsky 2001, pp. 74–75).
Children are engaged in various types of activities which contribute directly or indirectly to the development of EF, such as sport games, computer games, make-believe play, etc. Some of them have common elements with playworlds (imaginary dramatic situations, rules, roles). What makes playworlds unique is the role of an adult who can imbed EF tasks into the playworlds. This opens a new opportunity for investigation of the role of adults in playworlds in supporting the development of EFs in children. Playworlds are mostly theorised as collectively created imaginary situations with rules, roles and tasks (Lindqvist 1995); but in relation to the opportunities for the development of EF in children, the role of the adult seems to be a vital one and this needs further research.

Another interesting opportunity for further research is related to the concept of perezhivanie. As our research shows, in line with Vygotsky’s original theorisation, the individual perezhivanie of different children in the practice of playworlds are different. Therefore, the usefulness of playworlds must also be different. For some children it might facilitate the development of EFs, while it may be less effective for other children. Personal characteristics, such as the child’s cognitive abilities and skills, may be relevant here, as well as characteristics of the social situations of development in playworld activities. We believe, the concept of perezhivanie, as an indivisible unity of personal characteristics and environmental characteristics (Vygotsky 1994; Veresov and Fleer 2016), might be further elaborated as a tool for the analysis of this specific aspect of development of EFs in children. More research is required in this direction.

Playworlds are group activities and therefore ways of participation and individual reactions are diverse. The collected data shows some children’s actions do not necessarily promote the best opportunities to support EFs. When such a situation happens, the teacher should be “equipped” to deal with it in a flexible way and adjust the whole activity. Because of the limited amount of data, this aspect was not the focus of the theorisation we present in this paper; however, we believe one way is to explore further the process of how regulation through others, in the form of the collective activity of solving the EF tasks (inter-psychological plane) becomes a child’s individual self-regulation (intra-psychological plane).

We believe that the further elaboration of the concept of dramatic perezhivzanie, which includes a strong emotional aspect, might contribute to the extension of a cognitivist conceptualisation of EFs and their development in children (Röthlisberger et al. 2012). One of the possible ways is to further research the role of perezhivanie in all key components of playworlds (role distribution, crossing the border, playing out roles).

**Funding** This study was funded by the Australian Research Council (ARC) Grant LP150100279.X.

**Compliance with Ethical Standards**

**Conflict of Interest** Authors declare they have no conflict of interests.

**Ethical Approval** All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.
References

Alexander, K. L., Entwisle, D. R., & Dauber, S. L. (1993). First-grade classroom behavior: Its short- and long-term consequences for school performance. *Child Development, 64*(3), 801–814.

Antoniadou, V. (2001). Virtual collaboration, ‘perezhivanie’ and teacher learning: A socio-cultural-historical perspective. *Bellaterrae Journal of Teaching & Learning Language & Literature, 4*(3), 53–70.

Baddeley, A. (2006). Working memory: An overview. In S. J. Pickering (Ed.), *Working memory and education* (pp. 1–31). New York: Academic Press.

Bascandziev, I., Powell, L. J., Harris, P. L., & Carey, S. (2016). A role for executive functions in explanatory understanding of the physical world. *Cognitive Development, 39*, 71–85.

Baumer, S. (2013). Play pedagogy and playworlds. In R. E. Tremblay, M. Boivin, & Peters (Eds.), *Encyclopedia on early childhood development* [online]. Retrieved from http://www.child-encyclopedia.com/play/according-experts/play-pedagogy-and-playworlds. Accessed February 25, 2018.

Becker, D. R., McClelland, M. M., Loprinzi, P., & Trost, S. G. (2014). Physical activity, self-regulation, and early academic achievement in preschool children. *Early Education and Development, 25*(1), 56–70.

Berk, L. E., & Meyers, A. B. (2013). The role of make-believe play in the development of executive function. *American Journal of Play, 6*(1), 98–110.

Berk, L. E., Mann, T. D., & Ogan, A. T. (2006). Make-believe play: wellspring for development of self-regulation. In D. G. Singer, R. M. Golinkoff, & K. A. Hirsh-Pasek (Eds.), *Play=learning: How play motivates and enhances cognitive and social-emotional growth* (pp. 74–100). New York: Oxford University Press.

Bialystok, E., & Martin, M. (2003). Notation to symbol: Development in children’s understanding of print. *Journal of Experimental Child Psychology, 86*, 223–243.

Blair, C. (2002). School readiness: Integrating cognition and emotion in a neurobiological conceptualization of children's functioning at school entry. *American Psychologist, 57*(2), 111–127.

Blair, C. (2016). Developmental science and executive function. *Current Directions in Psychological Science, 25*(1), 3–7.

Bodrova, E., & Leong, D. (2006). Self-regulation as a key to school readiness: How early childhood teachers can promote this critical competency. In M. Zaslow & I. Martinez-Beck (Eds.), *Critical issues in early childhood professional development* (pp. 203–224). Baltimore: Brookes.

Bodrova, E., Leong, D. J., & Akhutina, T. (2011). When everything new is well-forgotten old: Vygotsky/Luria insights in the development of executive functions. In R. M. Lerner, J. V. Lerner, E. P. Bowers, S. Lewin-Bizan, S. Gestsdottir, & J. B. Urban (Eds.), *Thriving in childhood and adolescence: The role of self-regulation processes: new directions for child and adolescent development* (pp. 11–28). Jossey-Bass: Wiley Periodicals.

Bodrova, E., Germeroth, C., & Leong, D. (2013). Play and self-regulation: Lessons from Vygotsky. *American Journal of Play, 6*(1), 11–123.

Brennan, M. (2014). Perezhivanie: What have we missed about infant care? *Contemporary Issues in Early Childhood, 15*(3), 284–292.

Brocki, K. C., & Bohlin, G. (2004). Executive functions in children aged 6 to 13: A dimensional and developmental study. *Developmental Neuropsychology, 26*(2), 571–593.

Bull, R., & Scerif, G. (2001). Executive functioning as a predictor of children’s mathematics ability: Inhibition, switching, and working memory. *Developmental Neuropsychology, 19*(3), 273–293.

Chen, F. (2015). Parents’ perezhivanie supports children’s development of emotion regulation: A holistic view. *Early Child Development and Care, 185*(6), 851–867.

Davidson, M. C., Amso, D., Anderson, L. C., & Diamond, A. (2006). Development of cognitive control and executive functions from 4–13 years: Evidence from manipulations of memory, inhibition, and task switching. *Neuropsychologia, 44*(11), 2037–2078.

Deák, G. (2000). The growth of flexible problem solving: Preschool children use changing verbal cues to infer multiple word meanings. *Journal of Cognition and Development, 1*, 157–191.

Denckla, M. B., & Reiss, A. L. (1997). Prefrontal-subcortical circuits in developmental disorders. In N. A. Krasnegor, G. R. Lyon, & P. S. Goldman-Rakic (Eds.), *Development of the prefrontal cortex: Evolution, neurobiology, and behavior* (pp. 283–293). Baltimore: Brookes.

Diamond, A. (2013). Executive functions. *Annual Review of Psychology, 64*, 135–168.

Dockett, S., & Perry, B. (2007). *Transitions to school: Perceptions, expectations and experiences*. Sydney: UNSW Press.

Elias, C., & Berk, L. (2002). Self-regulation in young children: Is there a role for sociodramatic play? *Early Childhood Research Quarterly, 17*(2), 216–238.
Ferholt, B. (2009). The development of cognition, emotion, imagination and creativity as made visible through adult-child joint play: Perezhivanie through playworlds. (doctoral dissertation). Retrieved from ProQuest dissertations and theses. (ISBN 9781109162752).

Ferholt, B. (2010). A synthetic-analytic method for the study of perezhivanie: Vygotsky literary analysis applied to playworlds. In M. C. Connerly, V. John-Steiner, & A. Marjanovic-Shane (Eds.), Vygotsky and creativity: A cultural-historical approach to play, meaning making, and the arts (pp. 163–179). New York: Peter Lang.

Ferholt, B. (2015). Perezhivanie in researching playworlds: Applying the concept of perezhivanie in the study of play. In S. Davis, B. Ferholt, G. Clemson, S. Jansson, & A. Marjanovic-Shane (Eds.), Vygotskian and sociocultural approaches to drama, education and research (pp. 57–79). London: Bloomsbury Academic.

Ferholt, B., & Lecusay, R. (2010). Adult and child development in the zone of proximal development: Socratic dialogue in a playworld. Mind, Culture and Activity, 17(1), 59–83.

Fernyhough, C. (2010). Vygotsky, Luria, and the social brain. In B. Sokol, U. Muller, J. Carpendale, A. Young, & G. Iarocci (Eds.), Self-and Social-Regulation: Exploring the Relations Between Social Interaction, Social Understanding, and the Development of Executive Functions (pp. 56–80). Oxford: Oxford University Press.

Fleer, M. (2014). Theorizing play in the early years. New York: Springer.

Fleer, M. (2016). An everyday and theoretical reading of perezhivanie for informing research in early childhood education. International Research in Early Childhood Education, 7(1), 34–49.

Fleer, M. (2017). Digital playworlds in an Australia context. In T. Bruce, M. Brodky, & P. Hakkarainen (Eds.), Routledge handbook of play in early childhood (pp. 289–304). London: Routledge Press, Taylor and Francis Group.

Fleer, M., & Hammer, M. (2013). ‘Perezhivanie’ in group settings: A cultural-historical reading of emotion regulation. Australasian Journal of Early Childhood, 38(3), 127–134.

Fleer, M., Gonzales Rey, F., & Veresov, N. (2017). Continuing the dialogue: Advancing conceptions of emotions, perezhivanie and subjectivity for the study of human development. In Fleer et al. (Eds.), Perezhivanie, emotions and subjectivity: Advancing Vygotsky legacy (pp. 247–261). New York: Springer.

Fleer, M., Veresov, N., & Walker, S. (2017a). Re-conceptualizing executive functions as social activity in children’s playworlds. Learning, Culture and Social Interaction, 14, 1–11.

Fleer, M., Harrison, L. J., Veresov, N., & Walker, S. (2017b). Working with teachers’ pedagogical strengths: The design of executive function activities for play-based programs. Australasian Journal of Early Childhood, 42(4), 47–55.

Garon, N., Bryson, S., & Smith, I. (2008). Executive function in preschoolers: A review using an integrative framework. Psychological Bulletin, 134(1), 31–60.

Gill, S., Winters, D., & Friedman, D. S. (2006). Educators’ views of pre-kindergarten and kindergarten readiness and transition practices. Contemporary Issues in Early Childhood, 7(3), 213–227.

Hakkarainen, P. (2006). Learning and development in play. In J. Einarsdottir & J. T. Wagner (Eds.), Nordic childhoods and early education: Philosophy, research, policy, and practice in Denmark, Finland, Iceland, Norway and Sweden (pp. 183–222). Charlotte: Information Age Publishing.

Hakkarainen, P. (2008). The challenges and possibilities of a narrative learning approach in the Finnish early childhood education system. International Journal of Educational Research, 47(5), 292–300.

Hakkarainen, P. (2010). Cultural historical methodology of the study of human development in transitions. Journal of Cultural Historical Psychology, 4, 76–81.

Hakkarainen, P., Brędikytė, M., Jakkula, K., & Munter, H. (2013). Adult play guidance and children’s play development in a narrative play-world. European Early Childhood Education Research Journal, 21(2), 213–225.

Hammond, S., Bibok, M, & Carpendale, J. (2010). Theoretical perspectives on self and social regulation. In B. W. Sokol, U. Muller, J. M. Carpendale, A. Young & G. Iarocci (Eds.). Self and social regulation, (pp. 1–7), New York: Oxford University Press.

Hughes, C. (1998). Executive function in preschoolers: Links with theory of mind and verbal ability. British Journal of Developmental Psychology, 16, 233–253.

Hughes, C., & Graham, A. (2002). Measuring executive functions in childhood: Problems and solutions? Child and Adolescent Mental Health, 7(3), 131–142.

Kelly, R., Dissanyake, C., Ihsen, E., & Hammond, S. (2011). The relationship between symbolic play and executive function in young children. Australasian Journal of Early Childhood, 36(2), 21–27.

Lehto, J. E., Jujarvi, P., Kooistra, L., & Pulkkinen, L. (2003). Dimensions of executive functioning: Evidence from children. British Journal of Developmental Psychology, 21, 59–80.
Lindqvist, G. (1995). *The aesthetics of play: A didactic study of play and culture in preschools*. (doctoral dissertation). Uppsala University, Sweden.

Lindqvist, G. (1996). The aesthetics of play: A didactic study of play and culture in preschools. *Early Years, 17*(1), 6–11.

Lindqvist, G. (2001). When small children play: How adults dramatize and children create meaning. *Early Years, 21*(1), 7–14.

Lindqvist, G. (2003). Vygotsky’s theory of creativity. *Creativity Research Journal, 15*(4), 245–251.

Manuilenko, Z. (1975). The development of voluntary behavior by preschool-age children. *Soviet Psychology and Psychiatry, 13*, 65–116.

Margetts, K. (2007). Understanding and supporting children: Shaping transition practices. In A. H. Dunlop & H. Fabian (Eds.), *Informing transitions: Bridging research, policy and practice* (pp. 107–199). London: Open University Press.

Marjanovic-Shane, A., Ferholt, B., Miyazaki, K., Nilsson, M., Rainio, A. P., Hakkarainen, P., Pesic, M., & Beljanski-Ristic, L. (2011). Playworlds - an art of development. *Play and Culture, 11*, 3–31.

Martin, J., & Failows, L. (2010). Executive function: theoretical concerns. In B. Sokol, U. Muller, J. Carpendale, A. Young, & G. Iarocci (Eds.), *Self-and social-regulation: Exploring the relations between social interaction, social understanding, and the development of executive functions* (pp. 35–56). Oxford: Oxford University Press.

McClelland, M. M., Acocq, A. C., & Morrison, F. J. (2006). The impact of kindergarten learning-related skills on academic trajectories at the end of elementary school. *Early Childhood Research Quarterly, 21*(4), 471–490.

McClelland, M. M., Cameron, C. E., Connor, C. M., Farris, C. L., Jewkes, A. M., & Morrison, F. J. (2007). Links between behavioral regulation and preschoolers’ literacy, vocabulary and math skills. *Developmental Psychology, 43*(4), 947–959.

McClelland, M. M., Acocq, A. C., Piccinin, A., Rhea, S. A., & Stallings, M. C. (2013). Relations between preschool attention span-persistence and age 25 educational outcomes. *Early Childhood Research Quarterly, 28*(2), 314–324.

Mok, N. (2017). On the concept of perezhivanie: A quest for critical review. In M. Fleer, R. F. Gonzales, & N. Veresov (Eds.), *Perezhivanie, emotions and subjectivity: Advancing Vygotsky legacy* (pp. 19–46). New York: Springer.

Nilsson, M. (2009). Creative pedagogy of play- the work of Gunilla Lindqvist. *Mind, Culture and Activity, 17*(1), 14–22.

O’Sullivan, L. P., Mitchell, L. L., & Daehler, M. W. (2001). Representation and perseveration: Influences on young children’s representational insight. *Journal of Cognition and Development, 2*, 339–365.

Packiam Alloway, T. (2018). Introduction. In T. Packiam Alloway (Ed.), *Working memory and clinical developmental disorders: Theories, debates and interventions* (pp. 1–9). London: Routledge.

Perner, J., Lang, B., & Kloo, D. (2002). Theory of mind and self-control: More than a common problem of inhibition. *Child Development, 73*(2), 752–767.

Quíones, G., & Fleer, M. (2011). "Visual Vivencias": A cultural-historical tool for understanding the lived experiences of young children’s everyday lives. In E. Johansson & J. White (Eds.), *Educational research with our youngest: Voices of infants and toddlers* (pp. 107–133). Netherlands: Springer.

Röthlisberger, M., Neuenschwander, R., Cimeli, P., Michel, E., & Roebers, C. M. (2012). Improving executive functions in 5- and 6-year-olds: Evaluation of a small group intervention in prekindergarten and kindergarten children. *Infant and Child Development, 21*(4), 411–429.

Singer, J. L. (1961). Imagination and waiting ability in young children. *Journal of Personality, 29*, 396–413.

Stetsenko, A., & Viana, E. (2009). Bridging developmental theory and educational practice: Lessons from the Vygotskian project. In O. Barbarin & B. Hanna Wasik (Eds.), *Handbook of child development and early education: Research to practice* (pp. 38–54). New York: Guilford.

Subbotsky, E. (2016). Vygotsky-Luria approach towards “conscious action” and current research on “executive function”. *Sententia. European Journal of Humanities and Social Sciences. DOI: https://doi.org/10.7256/1339-3057.2016.1.17387 Retrieved from http://e-notabene.ru/psen/article_17387.html Accessed April 2019, 1, 48, 74.

Vadeboncoeur, J., Perone, A., & Panina-Beard, N. (2016). Creativity as a practice of freedom: Imaginative play, moral imagination, and the production of culture. In V. P. Glaveau (Ed.), *The Palgrave handbook of creativity and cultural research* (pp. 285–307). Aalborg: Palgrave MacMillan.

Veresov, N. (2017). The concept of perezhivanie in cultural-historical theory: Content and contexts. In M. Fleer, R. F. Gonzales Rey, & N. Veresov (Eds.), *Perezhivanie, emotions and subjectivity: Advancing Vygotsky legacy* (pp. 47–70). New York: Springer.
Veresov, N., & Fleer, M. (2016). Perezhivanie as a theoretical concept for researching young children’s development. *Mind, Culture and Activity*, 23(4), 325–335.

Vygotsky, L. S. (1989). Concrete human psychology. *Soviet Psychology*, 27(2), 53–77.

Vygotsky, L. S. (1994). The problem of the environment. In J. Valsiner & R. Van der Veer (Eds.), *The Vygotsky reader* (pp. 347–348). Oxford: Blackwell.

Vygotsky, L. S. (1997). *The collected works of L. S. Vygotsky; Vol. 4: The history of the development of higher mental functions*. NY: Plenum Press.

Vygotsky, L. S. (1998). *The collected works of L.S. Vygotsky* (Vol. 5). New York: Plenum Press.

Vygotsky, L. S. (2001). Lektsii po pedologii [Lectures on pedology]. Izevsk: Izdatelestvo Udmurtskogo Universiteta.

Vygotsky, L. S. (2016). Play and its role in the mental development of the child. *International Research in Early Childhood Education*, 7(2), 3–25.

Welsh, M. C. (2002). Developmental and clinical variations in executive functions. In D. Molfese & V. Molfese (Eds.), *Developmental variations in learning: Applications to social, executive function, language, and reading skills* (pp. 139–185). Mahwah: Lawrence Erlbaum.

Welsh, M. C., Friedman, S. L., & Spieker, S. (2008). Executive functions in developing children: Current conceptualizations and questions for the future. In K. McCartney & D. Phillips (Eds.), *Blackwell handbook of early childhood development* (pp. 176–187). Oxford: Blackwell.

Zelazo, P. D., & Müller, U. (2010). Executive function in typical and atypical development. In U. Goswami (Ed.), *The Wiley-Blackwell handbook of childhood cognitive development* (pp. 574–602). Malden: Blackwell Publishers.

Zelazo, P. D., Carter, A., Reznick, J. S., & Frye, D. (1997). Early development of executive function: A problem-solving framework. *Review of General Psychology, 1*, 198–226.

Zelazo, P. D., Muller, U., Frye, D., & Marcovitch, S. (2003). The development of executive function in early childhood. *Monographs of the Society for Research in Child Development, 68*(3, Serial No. 274)), 1–27.

**Publisher’s Note** Springer Nature remains neutral with regard to jurisdictional claims in published maps and institutional affiliations.

**Laureate Professor Marilyn Fleer** holds the Foundation Chair of Early Childhood Education and Development at Monash University, Australia. She was awarded the 2018 Kathleen Fitzpatrick Laureate Fellowship by the Australian Research Council and was a former President of the International Society of Cultural-historical Activity Research (ISCAR). Additionally, she holds the positions of an honorary Research Fellow in the Department of Education, University of Oxford, and a second professor position in the KINDKNOW Centre, Western Norway University of Applied Sciences.

**Dr. Nikolay Veresov** is an Associate Professor at the Faculty of Education Monash University, Melbourne, Australia. His area of interests is development in early years, cultural-historical theory and research methodology.

**Dr. Susan Walker** is a Professor in the School of Early Childhood and Inclusive Education at the Queensland University of Technology and a key researcher in the Cooperative Research Centre (CRC) for Living with Autism Spectrum Disorder. Her research interests include epistemic beliefs and teachers’ practice; teacher-child relationships; child outcomes in relation to inclusive early childhood education programs; early intervention and the transition to school.