

Affordance theory and children's agency in outdoor contexts: a review of the literature

Las teorías de las affordances y la agencia en contextos educativos infantiles al aire libre: una revisión bibliográfica

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ABSTRACT

This paper aims to examine the connections in the international literature over the past decade between affordance theory and children's agency in early childhood education in outdoor settings. A scoping review of 46 contributions was conducted to highlight the existing relationships between the two theories, which revealed the presence of different interpretations of affordance theory and possible declinations of agency's notion, particularly in the outdoor educational contexts. The search for connections showed that more recent declinations of affordance theory, particularly those that consider context from a sociocultural perspective, proved to be of particular interest, as they include more or less explicitly the notion of agency in the reflection. In addition, the literature review has shown that outdoor educational contexts prove to be particularly interesting because they support the actualization of affordances and, thus, the expression of children's agency: the complexity, multiplicity, and variability of invitations for actions present in outdoor contexts, suggest multiple

possibilities for use and interpretations. In this type of context, each child is configured as an actor in his or her own educational experience.

Keywords: Affordance, Agency, Outdoor, Literature Review, Early Childhood

RESUMEN

El objetivo de esta contribución es examinar las conexiones existentes en la literatura internacional de la última década entre la teoría de las affordances y la de agencia en contextos educativos de la primera infancia al aire libre. Para evidenciar las relaciones existentes entre las dos teorías y hacer un mapeo, se ha llevado a cabo una revisión de 46 contribuciones que han permitido evidenciar la presencia de diversas interpretaciones de la teoría de las affordances, como también la presencia de declinaciones posibles de las nociones de agencia, en particular en contextos educativos al aire libre. La búsqueda de conexiones ha mostrado que las declinaciones más recientes de la teoría de las affordances, en particular las que consideran el contexto desde una perspectiva sociocultu-

ral, resultaron ser de especial interés, ya que incluyen -más o menos explícita- la noción de agencia en la reflexión. Además, la revisión de la literatura ha mostrado que los contextos educativos al aire libre son particularmente interesantes puesto que apoyan la actualización de las affordances y, por lo tanto, la expresión de agencia de la que son portadores los niños y las niñas. La complejidad, la multiplicidad y la variabilidad de las invitaciones a la acción presentes en los contextos al aire libre, sugieren múltiples posibilidades de uso y se prestan a diferentes interpretaciones. En este contexto, cada niño se configura como actor de su propia experiencia educativa.

Parablas clave: Affordance, Agency, Aire Libre, Revisión de Literatura, Primería Infancia

INTRODUCTION

The International Convention on the Rights of the Child (United Nations, 1989) is the first international document that emphasizes the importance and uniqueness of children's perspectives, valuing their subjectivity and capacity for action within material, social and cultural contexts. Around the 1990s, a new paradigm for rethinking childhood was articulated (James, Prout, 1990), which conceives the child as a social actor, an active agent capable of modifying his or her own living conditions. This conceptualization, known as the sociology of childhood (Corsaro, 1977), views children as competent social actors and places their life experiences at the center. This theoretical tradition focuses on an idea of the child as active (James, Jenks, Prout, 1998) and capable of influencing learning contexts and experiences both individually and collectively (Corsaro, 1977; James, Jenks, Prout, 1998). The document *Seven Good Reasons to Build a Europe for and with Children* (2006) also preserves the right of children and adolescents to full participate without discrimination, as well as the need to take into account the opinions and insights of the youngest, by recognizing their right and possibility to influence contexts and experiences that affect them personally. More recently, the 2030 Agenda for Sustainable Development (United Nations, 2015) declared the need for a broader social commitment to the development of democratic practices that enable children and young people to be authentically involved in political decisions.

The ontological starting point that supports the-

se reflections lies in the assumption that children's perspectives are important and meaningful (James *et al.*, 1998). Hammersely (2016) in this regard adds that children should be treated as active agents, as subjects of law who carry unique perspectives and opinions, who should experience appropriate spaces of expression with respect to issues that affect them (Sheridan, Pramling-Samuelsson, 2001), and who should have the opportunity to experience contexts in which their agency, the exercise of active citizenship and participation in democratic processes are truly valued.

Increasingly, interdisciplinary research is shifting its focus from indoor to outdoor contexts (Katsiada, Roufidou, 2020), highlighting how the contexts of early childhood education services profoundly influence a child's cognitive, social and emotional development (Weinstein, 1987; Preisner-Freinberg *et al.*, 2001; Evans, 2006; Spencer, Blades, 2006; Moore, Sugiyama, 2007).

In this perspective, outdoor educational experiences are considered particularly significant (Farnè, Bortolotti, Terrusi, 2018) because they foster the opportunity to freely explore and actively make decisions based on personal needs and interests (Brymer *et al.*, 2018). Outdoor educational settings encourage a meaningful relationship with places (Guerra, 2020), in which restrictions on spontaneously grasped possibilities are loosened, and where it is possible to take greater responsibility, to the others and to the environment itself (Sobel, 2002). In this sense, learning experiences outside (Guerra, 2016) promote a sense of agency and empowerment while supporting the development of attitudes of care and respect toward the environment (Sobel, 2002). In fact, outdoor settings offer multiple possibilities for supporting and reinforcing children's agency through opportunities where they can act as active participants, designing their experiences and identifying new possibilities for action. In this regard, the theory of affordances, originally elaborated by Gibson (1979) but here considered with respect to its more recent declinations that conceive of the context from a sociocultural perspective (Kyttä, 2002; 2004; 2006), seems particularly interesting in order to understand children's experiences in outdoor contexts (Waters, 2011; 2017): in this sense, the theory poses at the center of its reflection what children do in a place, valuing their free initiatives, their creativity and their desire for independence and self-determination (*ibid.*).

Outdoor environments are considered to be of quality to the extent that they are able to provide a

range of spaces, materials and experiences that encourage a variety of possibilities for meaningful actions (Lesterstrup, Møller, 2016) and interaction, while allowing access to the natural world (Larrea *et al.*, 2017). Sobel (2002) in this regard argues that opportunities should be provided to manipulate the natural environment in respectful ways to make meaningful changes to play and experiences while addressing individual needs: participating in these everyday practices reinforces a sense of agency and the belief that contexts and circumstances can change through direct but respectful transformational actions (*ibid.*).

This paper, therefore, aims to identify possible connections between affordance theory and children's agency, particularly in outdoor educational settings.

METHOD

Database, keywords, and selection of inclusion criteria

In accordance with the object and goal of this literature review, it was decided to undertake a scoping review (Arksey, O'Malley, 2005): the review involved affordance and agency theory, specifically in outdoor contexts, to highlight connections and relationships found in the literature. Through queries, parallel searches on different databases were initiated; the exploration of different combinations of keywords led to the choice of two search strings, produced consecutively, which generated two separate lists of contributions. The first string used was affordance OR 'affordance theory' AND agency AND child* OR preschool OR kindergarten OR 'early childhood'. A second database search was then conducted, using the following string of words: affordance OR 'affordance theory' AND agency AND kindergarten OR 'young children' OR 'early childhood OR kids AND outdoor OR 'outdoor education'. In both searches, terms such as 'agents' or 'active agents' were included, here understood as synonyms of the term 'agency'.

The strings were used to query five different search engines, including *ProQuest Education Collection* and *EBSCO Educational Research Complete*, which were selected because they were specific to the educational sector, *Google Scholar* and *Prometeo*, which although generalist, they had allowed to identify a good amount of interesting results, and finally *Children & Nature Network*, which was selected because it was specifically dedicated to contributions exploring children's and youth's experiences in outdoor settings. Key-words were searched within the full-text and contributions

published in the last decade (2012-2022) were included, in the awareness that, with regard to affordance theory, developments and interpretations elaborated in the last decade are particularly interesting because of possible connections with children's agency. Finally, only English-language contributions, both peer-reviewed and belonging to the gray literature, were selected. Comparison of the search engines consulted revealed the presence of duplicate contributions, which were immediately excluded from the selection.

First reading of the results

From reading the titles and abstracts of the results of the first query it was possible to select 33 contributions, while through the second query 26 results were selected through the same procedure of reading titles and abstracts.

Contributions with a topic distant from the hypothesized topic of investigation, traceable already from reading the title or abstract of the contribution itself, were excluded. The topics that immediately resulted in the exclusion of the record were those related to language acquisition, the technological, musical and disability field, and mathematics/science teaching. In addition, contributions with a different target group were excluded, so empirical studies conducted with adolescents and adults were not included in the review.

Final corpus

The 59 results collected through the criteria just described were fully read, analyzed and organized in two review tables, which aimed to keep track of the following information: year of publication; title, authors and journal of publication; objectives of the study; geographic area and context in which the study was conducted; research design; participants, methodologies and instruments of data collection and analysis; main results; definitions of affordance theory and possible declinations of the concept of agency. Through this process of analysis, characterized by an in-depth reading of the collected material, 46 final contributions were selected.

RESULTS

From reading the data, it can firstly be deduced that most of the studies are published as journal articles, while 5 contributions belong to the gray literature. In addition, the selected studies were conducted throughout the Western world, specifically: n= 24

in Europe (Norway, Sweden, Finland, Iceland, Denmark, Switzerland, Spain, Greece and the Netherlands), n= 8 in the UK (England, Scotland, Wales, Northern Ireland), n= 1 in the U.S., n= 7 in Australia and n= 1 in New Zealand.

A significant number of studies present a qualitative research design (n= 35) while a small proportion of contributions favored a quantitative methodological framework (n= 5), and (n= 3) contributions presented a mixed-method design. Among the qualitative studies selected, 23 were conducted by adopting a participatory approach: these mostly prefer the use of interviews, in which tools such as drawings, photographs and child-led tours serve as expedients capable of eliciting thoughts and words of research participants, allowing access to otherwise unseen meanings, enabling young participants to play an active role in the data collection and data analysis stages. In addition, several empirical studies prefer the implementation of the Mosaic Approach (n= 11). One among the studies selected in this review uses the photo-voice methodology (Dell, 2018), often implemented with adults and adolescents, but increasingly popular among school and preschool-aged children as well; in this study, it proves to be a valuable tool to actively engage children between the ages of 3 and 6, and to access their views with respect to their outdoor experiences.

A final interesting aspect emerges from the first search engine query through the use of the first query, which aimed to explore the connections between affordance theory and children's agency, without specifying a peculiar context: it turned out that 19 out of 33 studies were conducted in outdoor settings, including natural settings such as forests, as well as more structured settings such as schoolyards or playgrounds.

The following sections of this paper aim to present the main declinations encountered of affordances theory and the meanings attributed to the concept of children's agency, particularly in outdoor contexts; finally, the connections identified between the two theories examined are to be highlighted.

THEORY OF AFFORDANCES

Starting with James Gibson, the one who coined the term affordance (1979), various declinations of the concept have been formulated: in accordance with previous work (Guerra, 2022), some of the possible ones will be briefly presented in this literature review.

According to Gibson, affordances are the possibilities offered by objects, in a complementary relationship between the environment and the animal: the author places special emphasis on the animal's subjectivity and uniqueness, so much so that he points out how different animals grasp different affordances in the same environment. Thus, it can be inferred that, what immediately captures the animal's attention are not the physical qualities of objects but its affordances, which relate as much to the subject as to the environment (Gibson, 1979).

In a later period, the term affordance was adopted mostly in the field of research concerning children's action in outdoor contexts (n= 16): in this regard, a crucial work is conducted by Heft (1988), who asserts that an environment cannot be described only by referring to its physical characteristics, its shapes, but also and above all with respect to the functional meaning attributed to it. His functional approach aims to show new subjective ways through which an environment can be viewed. In fact, from the same environmental feature it is possible to trace multiple functions: therefore, more possibilities are offered, which not only change with respect to the variability of spatial features, but also during the process of an individual's development. This means that over time a subject might perceive some rather than others (*ivi*).

These theoretical assumptions have obvious repercussions in educational practices: if an adult interprets the environment in terms of its forms, a child, on the other hand, is more captivated by what might be done in it (Guerra, 2022): it is thus intuited that the affordances available in a given environment vary between adults and children (*ivi*). Fjørtoft (2001) instead focusing his work on the affordances available in outdoor settings, suggests that complexity, heterogeneity and environmental richness, are highly associated with a greater degree of play opportunities (*ibid.*); in his work, as also previously emerged in the work of Sageje (2000), the focus is on the connections between environment's characteristics and play functions: the forest setting in this regard is elected as the preferred environment for play and movement (Fjørtoft, 2001, p.8). The richness of outdoor contexts, bearers of greater variability of affordances, as well as fewer limitations on the possibilities for action, also emerges clearly in the work of Fiskum and Jacobsen (2013).

Bjorgen (2016) focuses his work on the characteristics of the affordances of different outdoor environments, with the intention of capturing their in-

fluence on children's physical activities, pointing out that this reaches high levels particularly when spaces, specifically those characterized by large areas in which to move in presence of flexible materials, offer variation, challenges and diverse opportunities for various types of play and free movement solutions.

Sando and Sandseter (2020) also confirm the positive role of different affordances in the environment as being able to effectively support children's active play, and consequently their sense of well-being.

Other works, finally, seem to be more oriented toward the design of outdoor spaces, understood as places potentially capable of optimizing the actualization of affordances (Kernan, 2010, Zamani, Moore, 2013; Acar, 2014; Larrea *et al.*, 2019).

Thus, affordance theory was implemented in different ways, declinations and objectives in the selected empirical research, appearing to be an essential theoretical assumption, constitutive of the theoretical framework of most of the contributions analyzed. Moreover, the concept of affordance proves to be a valuable tool for obtaining suggestions with respect to children's involvement in their environment (Falcini, 2014): thus, the importance of reconsidering how much the context encourages subjects to act within it emerges, but also how it can constantly change as a result of the child's actions and vice versa.

This theory has also been implemented to inform the data collection phase in order to explore children's ideas perceptions specifically with respect to what they would like to do in their contexts (Fiskum, Jacobsen, 2012; Pairman, 2018; Hammersten, 2021). Or, Michael, Still, and Costall (1992) exploit the theory as a lens for data analysis (Stordal, Frollo, Pareliussen, 2015), paying particular attention to free play: the authors note how predominantly this activity plays a role in the independent exploration and discovery of the latent affordances of the environment.

Finally, the theory of affordances is used because it is recognized that it can offer an important reference for considering usefulness and flexibility of the physical context, based on the unique relationship that is created between the context and the person (Storli, Sandseter, 2018), a relationship that is based on practical activities, specifically on the subject's possibilities for action, confirming itself as a valid interpretive key to educational experiences in outdoor settings. It is from this perspective that more recent declinations of the concept of affordance appear particularly interesting, as well as those that attribute a central role to the sociocultural dimension, which, as this review

shows, was undervalued for a period in favor of a more physical dimension. In particular, the works of Marketta Kyttä (2002; 2003; 2004) and Jane Waters (2011; 2017) encourage an openness of gaze, which allows to include children's agency in the present reflection.

CHILDREN'S AGENCY

The literature review shows that agency is a present but mostly marginal concept in the contributions analyzed: this theory rarely plays a predominant role, but rather represents a theoretical assumption underlying researches, particularly that characterized by a participatory approach in outdoor educational settings (Malone, 2013; Norödahl, Einarsdottir, 2015; Ellis *et al.*, 2021).

The study conducted by Manyukhina (2022), that is focused on the analysis of the English curriculum, specifically on the ways in which the concept of agency is presented, reveals a lack of explicit attention to this theory that denies or limits possibilities in practice, such as the possibility of playing a role as co-participants in the process of discovery, exploration and knowledge creation, consequently inhibiting children's autonomy and awareness.

As previously mentioned, traced recurrently is the term 'agent', used as a synonym for agency in the selection of contributions included in the review (Malone, Hartung, 2010; Stordal, Frollo, Pareliussen, 2015; Gurholt, Sanderud, 2016; Ward, 2018), a noun that refers to children understood as subjects who occupy a relevant position in their political communities, social environments, and institutional settings; they are conceived as subjects of action who inhabit and participate in the activities of their lived environments, simultaneously shaping their worlds in the present and future (Kallio, Häkli, 2013). In addition, the review process also shows that the term 'participation' frequently emerges in combination with the possibility of the expression of agency (Malone, Hartung, 2010; Elliott *et al.*, 2018; Pairman, 2018).

In the analyzed literature, it was possible to trace different declinations attributed to the notion of agency. First of all, James and Prout (1990) define it as the ability of individuals to act independently, so children can be seen as independent social actors. Children in this sense are understood as social agents, especially in relation to their natural environment, as they learn to respond to nature's affordances in personal and active ways (Stordal, Follo, Pareliussen, 2015).

Malone (2013) goes on to argue for the importance of fostering collective actions, which allow young people to be increasingly engaged in the contemporary society as the most reliable representatives of their inner and social worlds (Wyness, 2006). It is also clear that the possibility to take action in nature (Kangas *et al.*, 2014) and to experience more freedom and independence in outdoor contexts is positively connected with the expression and the development of a deeper sense of agency (Bateman, 2011).

The agency is also understood as the feeling of being like actors and actresses in one's own world (Hilppö *et al.*, 2016), definition that reveals its social construction, which is substantiated within the relational connections that exist between individual capacities, aspirations, perceived opportunities and constraints to take actions.

Children, then, have the capacity to make decisions with respect to the things they do and to express their ideas (*ibid.*), and the ability to exercise control with respect to the directions they wish their lives to take, a conception in opposition to those that conceived of the child as lacking with respect to adult characteristics (James, Jenks, Prout, 1998; Dahlberg, Moos, 2004). The child in this perspective was seen as a subject in the making, a transactional object, existing in the social periphery of the adult world (Prout, 2000; Wyness, 2006). These conceptions have been completely challenged and replaced by the sociology of childhood (Corsaro, 1977; Mayall, 2002), which replace at the center the need to recognize the youngest sense of agency. The work of James, Jenks and Prout (1998) thus calls for the need to conceive of children as social actors who modify and are themselves modified by circumstances and context (Malone, 2013).

Hence, the agency can be understood as an individual's ability to act in a given context (Emirbayer, Mische, 1998; Manyukhina, 2022), as the freedom to express one's own ideas and opinions; in this sense, children are understood as individuals capable of contributing with energy and creativity to the management and resolution of problems that affect them. But increasingly, the busy schedule imposed by some educational services tends to reduce opportunities for children to express their voices in situations that can have a significant impact on their lives (Aminpour, Bishop, Corkey, 2020).

As affirmed by the sociocultural tradition on childhood, children are active members of their communities (James, Prout, 1990; Kjörholt, 2007; Strandell, 2010) and can participate both individually and

collectively in more or less formal institutional settings as active agents (Kallio, Häkli, 2013).

Ingold (2011), on the other hand, shifts the focus to the socio-material space and interactions that take place within the child's sociocultural environment. More specifically, Klocker (2007) hypothesized a distinction between thin and thick agency: thin agency refers to actions performed in highly restrictive contexts, while thick agency refers to contexts in which the person has choices from a wide range of options (Klocker, 2007, p.85). These definitions appear promising when aiming to reveal children's actions and perspectives, within processes of producing their own spaces (Hackett, Procter, Seymour, 2015).

In continuity with what has just been mentioned, the agency cannot be defined only as a primary characteristic of an individual, but must be considered in relation to the sociocultural contexts in which it is enacted (Sharma-Brymer *et al.*, 2018).

In this sense, the agency is viewed as a process, which is constructed relationally and dynamically: the socio-culturally mediated capacity to act is jointly produced with a network of different actors, both human and non-human, and is distributed among them (*ibid.*).

It is therefore impossible to talk about agency without there being a context in which it can be experienced and expressed: in this sense, it is defined as the dynamic capacity of subjects to act in relation to the heterogeneity of actors and contexts. According to Waters (2017), outdoor space seems to be preferred by children (Ernst, 2017) and they offer them more opportunities to exercise their agency than those offered by the indoor environment: outside (Guerra, 2016) practices that would otherwise be considered unacceptable, rude or inappropriate are enacted, which instead appear to be more legitimized (Mannion, 2007), and there are increased opportunities for adults not to be guided by predetermined goals (Gurholt, Sanderud, 2011; Stordal, Follo, Pareliussen, 2015; Waters, 2017). These opportunities are essential for each person to realize and express their agentic potential (Manyukhina, 2022): in this sense, children can be seen as active explorers and playful agents (Guholt, Sanderud, 2011).

So, to conclude, agency is also defined as a socially situated capacity to act, an individual potential, which, however strong it may be, will remain unfulfilled in the absence of structural properties, and such opportunities, however concrete, will remain irrelevant in the absence of individuals who perceive

themselves as capable of acting and exploiting these opportunities. It is precisely when the opportunities available to agents are recognized by them that they are transformed into affordances: it is affordances, and not mere opportunities, that becomes essential prerequisites for the exercise of agency (Mercer, 2011).

DISCUSSION

This section intends to present the more or less explicit connections tracked between affordance theory and children's agency in outdoor contexts.

In the previously described interpretations of affordance theory, children's agency has been an ignored, marginal or peripheral aspect: it is, however, in the results below that the possible connections become more evident, particularly in the contributions that adopt a declination of the concept from a socio-cultural perspective, in which it is possible to sighting the subtle link that includes the notion of agency in the reflection. In this regard, the works of Kytä (2002; 2004) extend the concept of affordance by introducing the definitions of potential affordances and actualized affordances (Kytä, p. 67): by the latter are meant affordances that are revealed through actions, which can only be defined by an individual in his/her personal interaction in the world (*ibid.*).

In the field of transactional research (Epstein, 1995), the 'person-environment' relationship is conceived as a dynamic and interactive system, the components of which cannot be taken out of context; transactionalism allows to grasp the complex bi-directionality of the relationship between the individual and the environment, and conceives of the individual and the environment as both having agency (Clark, Uzell, 2006): the core of this model, termed transactional-ecological, lies its emphasis on the bidirectional and interdependent effects that take place between subject and environment. In this regard, the work of Kytä (2002; 2004) focuses precisely on the interaction between children and their material environment, as well as their sociocultural reality (Lynch, 1977): thus, it is meant a relationship that is substantiated between the subject and its context, conceived in all its complexity and characterized by material, cultural and social components (Ingold, 1996). In this sense, affordances for action are thus subject to, as well as constrained by, social and cultural factors, in addition to physical characteristics related to agent-environment interaction (Falcini, 2014; Cattaruzza, 2018; Waters, 2017). Carr (2000b), in light of the empirical data collected,

demonstrates how historical and socio-cultural social practices play a central role in affordances for activity: with this statement, it is again confirmed that the concept of affordance should be considered from a socio-cultural and socio-constructivist perspective, through a socially, historically, and culturally mediated understanding. The author describes this process as the power of social practices to reshape the perception of physical affordances: in other words, the act of perceiving an affordance is influenced not only by the physical attributes of the objects in relation to the person perceiving them, but is also influenced by the sociocultural context of the perceiving person, which includes their previous experiences made on similar objects, cultural norms, and expectations (*ivi*).

So, it becomes evident how much children's actions and interactions in a context are modified not only by their perception of the physical affordances of space, but also by cultural conventions (Oliver, 2005).

Kytä (2004) adds that the concept of affordances can be extended further, to include also the emotional, social and cultural opportunities that the individual perceives in the context: here there is a reference to the work of Reed (1993), who states that rules dictated by the cultural context, as well as educational practices, govern which affordances can be used or shaped (*ibid.*).

In this regard, a model has been constructed that effectively represents potential affordances, which are potentially infinite, as opposed to actualized affordances, which are instead revealed through the individual's actions. Potential affordances fall into three subsets, known as fields, since it is possible for them not only to be activated but also to be constrained: the field of promoted actions, which governs when, where and how affordances can be perceived, actualized or modified, through socially approved ways (socially and culturally supported affordances belong to this field); the field of constrained actions, which indicates the limitations to the actualization of affordances, dictated not only by rules, but also by structural features of objects and contexts that are defined as "unfriendly"; finally, the field of free actions, which consists of the affordances that the individual uses and modifies in a way that is completely independent and unconstrained by adult proposals and expectations, beyond what is supported or discouraged (Kytä, 2002; 2004). This field seems to be of particular interest because it is able to recognize children's agency and the value of their independent choices in situations (Waters, 2017); in fact, this field allows to reco-

gnize the specific perspective of children, expressed through the implementation of affordances not expected by the adult but identified and acted upon by children in total autonomy, based on interests, needs, experiences and perceptual, motor, and social skills, regardless of what is encouraged (Guerra, 2022).

So, the ways in which contexts can be used by children transcend the predetermined goals for which that place was designed (Hammersten, 2021): the context and its features offer opportunities to their users (*ivi*) regardless of whether or not these opportunities were designed or planned by adults (Heft, Chawla, 2002). The affordances of a context in fact include everything people can do with and within it, so they always offer more than one opportunity for action. Falcini (2014) too, focusing his research interest on preschool outdoor environments, highlights how much the actualized affordances of a given context depend on the regulations that govern its use. He focuses his analysis on the potential affordances, relating to everything a child might do in a context; the perceived affordances, that is all those play options and opportunities that a child may perceive in a context (for example, if trees are not visible, they may not be considered among the play options; similarly, as children become accustomed to the presence of rules in a certain place, they may not consider some play options, because they are aware that they are not allowed); the utilized affordances, that is all play, as well as possibilities that are concretely realized in a context; the modified affordances, an expression by which we refer to the possibility of creating new avenues of play, through manipulation of the context, to create new affordances; and finally, the actualized affordances, that is perceived, utilized and modified possibilities, which take into account the rules of the context (*ivi*). It is thus evident how much, through freedom of action, children are capable to actualize unseen possibilities, modifying the context to meet their play needs. So, it is possible to infer that the context offers them something that may or may not be perceived, utilized, modified: it offers a potential for activities, but their utilization manifests itself only when the subject's various characteristics such as physical abilities, social needs (Dings, 2018) and personal intentions meet favorable contextual features, (Kyttä, 2002; 2004), and are not hindered by adult constraints.

In this regard, Kernan (2014) and Spencer and Blades (2006) also understand affordances as opportunities provided to children by a physical and social context that can support play, exploration, and the expression of their agency (Katsiada, Roufidou,

2020); they go on to state that these possibilities exist whether or not they have been assumed by the adult. Thus, children can express and exercise their agency when adults allow them the freedom to explore space and materials in ways they prefer, through unconventional strategies, creatively exploiting all the available resources in the physical and social context (*ibid.*).

Waters' (2011; 2017) work also appears relevant in this regard as she enriches the reflection by introducing the notion of interactional affordances to describe the interactions between children and adults that take place in a certain space (*ibid.*); building on Kyttä's contribution, she outlines a model aimed at focusing on interactional affordances, which are in turn mediated by three fields: the field of interactional limitation, which includes the physical characteristics of the space that allow or limit interactions; the field of promoted interaction, which includes local rules of engagement as well as culturally defined and socially accepted interactions; and the field of free interaction, which includes children's agency, their choices, thus, their independent initiatives relating to others. Specifically, interactions between the child and the context would be mediated by several factors such as institutional norms of behavior, pedagogical approach (including teachers' expectations), parents' expectations, the presence of other agents, and most importantly, children's own expectations (Waters, 2017). The domains, defined within the broader sociocultural context, allow for a more in-depth understanding of children's behaviors, as they consider their context, here understood in its broadest sense, and its repercussions in terms of constraining or promoting action (Guerra, 2022).

In more recent contributions, affordances are understood as incentives to action (Fiskum, Jacobsen, 2012): action is initiated through the limbic system and is regulated by the cerebral cortex (Jacobsen, Svendsen, 2010). The cortical interpretation of a visually perceived scene or situation determines whether the action incentive from the limbic system should be interrupted, granted fully or partially. So, our cortical activity, from the limbic system, regulates action tendency in the same way that emotions are regulated. These assumptions offer a new perspective with respect to the interpretation of affordances theory (Yoon, Humphreys, Riddoch, 2010) that might be able to explain how affordances in indoor or outdoor contexts require different cortical regulation demands. Indeed, in indoor contexts, children often have to regulate or even suppress their tendency to action invited by the available affordances; in contrast, in

outdoor contexts, adult demands and expectations with respect to the posture afforded to children require less need for regulation of the natural tendency to action, which in these contexts is allowed and initiated by the limbic system. This over-regulation, which turns into suppression of action, is very stressful for some children, who modify their behavior as a result. It is therefore hypothesized that the outdoor context may offer more opportunities for action, specifically for physical activity, which itself reduces stress and increases motivation to learn (Jacobsen, Svendsen, 2010).

Hence affordances, also understood as invitations for action (Withagen et al., 2012; Fiskum, Jacobsen, 2012; Withagen, Araújo, de Poel, 2017; Brymer et al., 2018), as actionable properties (Little, Sweller, 2015) imply subjects' agency because affordances can invite behavior only if the agent is in a position to perceive and be able to discover them (Ellis et al., 2021). It is therefore suggested that affordances are not always good and useful for everyone indiscriminately, but rather, that sometimes they may even be "harmful" (Sharma-Brymer et al., 2018). A prerequisite is that there is an agent actively exploring the affordances of his or her environment (Withagen, Araújo, de Poel, 2017; Kernan, 2010), which can invite a potentially infinite set of possibilities for behavior (Withagen, Araújo, de Poel, 2017). The subject as agent then becomes a resource itself, because it depends on his or her personal choices which affordance will be actualized, thus becoming responsible for it (Prieske et al., 2015).

CONCLUSIONS

In conclusion, the aim of this review is to describe and summarize the findings of some studies conducted in the last decade in the international context that connect affordance theory and children's agency in outdoor contexts.

The search for connections has immediately suggested that the former theory is often associated with educational experiences conducted in outdoor contexts and that it is used as a lens for analyzing and interpreting outdoor experiences: the complexity and multiplicity of affordances present in outdoor contexts suggest multiple possibilities for use and offer a wide range of interpretations, which can be declined subjectively by each individual based on personal characteristics, structural, social and cultural factors in the context itself. In this regard, interpretations of the concept of affordances according to a sociocultu-

ral perspective are those that considered in reflection the concept of children's agency, in this contribution considered to be of central importance, as capable of recognizing specificities, capacities and children's auto-determination, in accordance with the guidelines of international documents (United Nations, 1989; 2015). Read from this perspective, affordances redefine the centrality of the subjects, foregrounding their possibilities for action, interpretation and interaction. The literature review shows that the context, as much as it may present with structural features favorable to the actualization of affordances, may prove to be unfriendly (Kyttä, 2002; 2004) when it presents physical barriers and also sociocultural limitations dictated by adult perspectives and perceptions, which inhibit children's possibilities for action according to subjective timing, modalities and meanings. (Aminpour, Bishop, Corkery, 2020).

From these assumptions, it seems it may be interesting to explore deeply these dimensions, asking what possibilities for action are promoted, constrained or free for children themselves in the outdoor contexts they frequent in their daily lives.

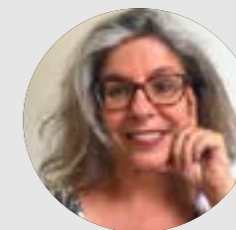
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