ARTIGO

ACADEMIC AND SOCIAL SKILLS INTERVENTIONS: A LITERATURE REVIEW

INTervenções em habilidades acadêmicas e sociais: Uma revisão da literatura

INTervenciones en habilidades académicas y sociales: Una revisión de la literatura

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ABSTRACT: This integrative review sought to identify empirical articles on interventions in the educational field whose theoretical basis is Bronfenbrenner's bioecological matrix and the focus was on the development of academic and/or social interaction skills associated with children's learning. The search was carried out using the following descriptors: "psychosocial mathematics", "psychosocial", "psychoeducational", "mathematics", "reading", "writing", "learning", "social" and "social skills", associated with the terms "intervention", "Bronfenbrenner" and "interaction" in Portuguese, Spanish and English. The review retrieved 59 articles between 1999 and 2020 on the Capes Journal Portal without database restrictions; there were search results in English and Spanish, with no returns in Portuguese. Most returns were in English. 11 articles were analyzed. It
should be noted that 6 of them were focused on the period before entering school. It is noteworthy that 3 studies focused on socio-emotional development with an interactional approach. A limiting factor of the study is the low number of articles found, which suggests more research with interventions using Bronfenbrenner's bioecological matrix.

**KEYWORDS:** review, intervention, social skills, academic skills.

**RESUMO:** Esta revisão integrativa buscou identificar artigos empíricos sobre intervenções no campo educacional cuja base teórica é a matriz bioecológica de Bronfenbrenner e o foco foi o desenvolvimento de habilidades acadêmicas e/ou de interação social associadas à aprendizagem infantil. A busca foi realizada com os seguintes descriptores: "matemático psicosocial", "psicosocial", "psicoeducacional", "matemática", "leitura", "escrita", "aprendizagem", "social" e "habilidades sociais", associados a os termos "intervenção", "Bronfenbrenner" e "interação" em português, espanhol e inglês. A revisão recuperou 59 artigos entre os anos de 1999 e 2020 no portal de periódicos da Capes sem restrições de banco de dados, houve resultados da busca em inglês e espanhol, sem retornos em português. A maioria dos retornos foram em inglês. Foram analisados 11 artigos, Ressalta-se que 6 deles eram focados no período anterior ao ingresso na escola. Destaca-se que 3 estudos tinham foco no desenvolvimento socioemocional com abordagem interacional. Um fator limitante do estudo é a baixa quantidade de artigos encontrados. O que sugere mais pesquisas com intervenções com a matriz bioecológica de Bronfenbrenner.

**PALAVRAS-CHAVE:** revisão, intervenção, habilidades sociais, habilidades acadêmicas

**RESUMEN:** Esta revision integrativa tuvo como objectivo identificar artículos empíricos sobre intervenciones en el campo educativo con base teórica en la matriz bioecológica de Bronfenbrenner, centrándose en el desarrollo de habilidades académicas y/o de interacción social asociadas al aprendizaje infantil. La búsqueda se realizó utilizando los siguientes descriptores: "matemática psicosocial", "psicosocial", "psicoeducacional", "matemática", "lectura", "escritura", "aprendizaje", "social" y "habilidades sociales", junto con los términos "intervención", "Bronfenbrenner" e "interacción" en portugués, español e inglés. La revisión produjo 59 artículos publicados entre 1999 y 2020 en el portal de revistas Capes, sin restricciones de base de datos, con resultados en inglés y español, pero ninguno en portugués. La mayoría de los artículos fueron en inglés. Se analizaron 11 artículos, de los cuales 6 se enfocaban en el período previo al ingreso a la escuela. Además, 3 estudios se enfocaron en el desarrollo socioemocional con un enfoque...
interaccional. Un factor limitante del estudio es el bajo número de artículos encontrados. Lo que sugiere más investigaciones con intervenciones utilizando la matriz bioecológica de Bronfenbrenner.

**PALABRAS CLAVE:** revisión, intervención, habilidades sociales, habilidades académicas

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1. Introduction

Mainly, formal mathematical knowledge is constructed at school, and additionally it is constituted in an intertwined way with everyday practices and with other areas of knowledge. It is also important to highlight the relevance of the basic contents, especially because if they are not well established and considering their cumulative content, they can cause consequences throughout an individual's life. Hence, mathematics in the initial years is fundamental, and subsequently all courses make use of mathematical knowledge. However, when this knowledge is passed on in a way that is dissociated from everyday practices and in a decontextualized way, there is a dissonance.

In some countries, one of the tests carried out to assess academic skills, which includes mathematics, is the Program for International Student Assessment (PISA). PISA is coordinated by the Organisation for Economic Co-operation and Development (OECD). The tests provide students’ data whose basic education has been completed. The proposal is to evaluate school content in everyday life. The test is expected to provide indicators that contribute to the debate on education to improve basic education policies. Until 2015, the areas evaluated were science, reading and mathematics. Regarding data from the test carried out in 2015, an American
global management consultancy company, McKinsey & Company, in which professionals from different areas work, published a report analyzing PISA data from students in Latin America (Dorn et al., 2017). In its report, the company presents as factors related to the best performances of schools participating in PISA the attitude and motivation of students, as well as their experience in the classroom. These factors proved to be more relevant than the socioeconomic issue, according to the company analysis, based on better performance in other countries with the same socioeconomic level. Contrary to what was believed, the influence of students' attitudes and beliefs is twice as great as their economic level. For beliefs, they considered thoughts related to the feeling of belonging and believing in one's own growth. Differences were also noticed when the teacher guided students regarding content or the use of technology. Another factor that proved to be different is the student's time at school, in addition to the calibration of motivation. In this case, the concept of motivation is more about understanding what motivation is than describing oneself as motivated. Low motivation has been correlated with low performance in mathematics and reading (Parhiala et al., 2018).

According to OECD itself, better-performing students have a slightly higher level of life satisfaction than those with average performance (OECD, 2015). However, when comparing Brazil's performance rates in PISA to other countries, it has one of the lowest rates, considering some aspects. For example, Russia's health-related scores are lower than those in Brazil, while the PISA score is higher than Brazil's by almost 300 points (Kirkcaldy et al., 2004). An interesting fact is that Korea's Human Development Index (HDI) data, compared to several other countries, is lower; however, in science and mathematics, this country is among the first in the general ranking. However, its performance ranking does not guarantee high levels of well-being and satisfaction with life. Korea has more than 20% dissatisfaction with life, compared to 4% in the Netherlands (OECD, 2015, 2017). Brazil has one of
the worst performance *rankings*, with the lowest averages in the OECD, with its worst performance in mathematics (MEC, 2016). Likewise, Brazil also has low levels of well-being and satisfaction with life (Peiró-Palomino & Picazo-Tadeo, 2018), which seems to mean the need to consider both aspects together. In 2018, the OECD also reported that bullying averages in Brazil are twice the world average, so that 28% of school directors reported having witnessed bullying situations.

In comparisons within Brazil, the influence of socioeconomic level is noticeable in test results such as ENEM (Exame Nacional do Ensino Médio – National exam of the high school). The worst performance occurs in public schools. Another difference in socioeconomic level is the access to a greater amount of cognitive stimuli in more privileged classes, whether due to the quantity/quality of vocabulary or the diversity and quality of more diverse environments, in which individuals from privileged classes are inserted. Furthermore, there are studies that correlate the mother's education with school performance (Robson & Araújo, 2010) and with the person's highest level of education (Longo & Vieira, 2017).

Considering this context of early stimuli, in order to promote the development of the person, Rogoff (1993) describes the importance of daily activities that provide social and practical interaction for the development of culturally specific skills. She described these as relevant for the construction of meaning. In addition, increasing the time spent in environments that encourage more productive and student activities, also provide a sense of belonging to students are factors that can even help reduce dropout rates and violence as a whole (Rolim et al., 2014). Following this line of reasoning, Bronfenbrenner and Morris (2006, p. 795) bring up the importance of studying development with context and contexts with development.

Given the circumstances, to research learning in psychology involves reflecting on activities that may foster identification with schooling,
playfulness and pleasure in the teaching-learning relationship, the development of social skills, and well-being. Within an ideal scenario, interventions would also include psychosocial aspects. In this way those who have ease can deal with those who have difficulty, and both can feel included in the social group, especially those who need more. An example of working together can be seen in the proposal addressed by Radford (2020) in the Theory of Objectification. The researcher presents experiments in which children work collectively to solve mathematics problems, configuring a proposal to work on social interaction, in a more affective and responsible way towards others, with the mediation of the mathematics teacher.

In the long term, difficulties with numerical skills can be socially and personally devastating (Geary, 2013). Therefore, interventions are necessary. Anyone who has difficulty completing activities valued by culture may end up being inferior for being “different”. Interventions comprise an action that can be preventive or that acts directly on learning problems, integrating academic and social development issues. Culture influences the individual at the same time as it constitutes them, according to the vision of cultural psychology, which understands the diversity and connection between individual behavior and the cultural context, as described by Pizzinato (2010). Based on Vygotskian perspective, the culture helps in this process of understanding the context in development; therefore, interventions are also a way of contextualizing the development process.

In that sense, the bioecological model of Bronfenbrenner, coming from a Vygotskian matrix, presents a systemic dialectical interactional vision and broader action in the vision of human development, maintaining coherence with cultural psychology. Developed by Russian-American psychologist Urie Bronfenbrenner (2011), the model conceives the person and their development in different aspects, including the vision of a human being who is always in interaction and evolution constantly. The bioecological model of
human development, as well as its proposal, has evolved over time. The initial thesis of Bronfenbrenner (1979) conceived the ecological model. Australian researchers Perry and Dockett (2018) describe this evolution of Bronfenbrenner's work, highlighting that, firstly, the author carried out an analysis of the existing research published on development throughout history. The focus was not only on individual issues, but on the person immersed in a group of concentric systems that, in turn, affect their development. It is a way of understanding the person, considering them inserted in the multiple environments in which they find themselves. Gradually, the author began to work on the influence of time, going through this entire interactional process. In 2006, there was an update to the bioecological model, so that it now gives greater weight to individual issues in the person's development process. Perry and Dockett (2018), present in their work that Bronfenbrenner and Morris (2006) describe some fundamental transformation points in the reading of development, considering the phenomenon of continuous group and individual changes in human beings, such as changes in and through biopsychological characteristics. This phenomenon extends throughout people's life course, including successive generations. The model is based on four pillars, in an interdisciplinary and integrative way: (1) process; (2) person; (3) context; and (4) time. The central part of the model are the processes seen as proximal, which mean interactions between person and environment, given the immediate and more remote environmental contexts in a period of history. The "person" element refers to the biopsychological characteristics of the person. After reconsidering the weight of the person in this interactional process, given that the author himself criticized the lack of that, the ecological model was updated to the bioecological model.

Within personal issues, there are three types of characteristics that have a strong influence on altering or maintaining the interactional system.
The first is related to the person's personality, which can move or change the continuity of the system in proximal processes. The second refers to the biopsychological resources of ability, experience, knowledge and dexterity at certain stages of development. Finally, demand characteristics concern encouraging or discouraging reactions from social environments (Bronfenbrenner & Morris, 2006, pp. 795–796)

Bronfenbrenner and Morris (2006) also consider that development occurs due to the influence of multiple configurations and interactions between these configurations, a basic premise of the theory of bioecological systems. The model is divided into 5 main systems that influence a person's development: microsystem, mesosystem, exosystem, macrosystem and chronosystem. The microsystem comprises direct interaction groups, such as the family itself, the school teacher, closest colleagues (from work or school), spouses, therapists etc. The bioecological model includes by itself interactions with people nearby, objects and symbols. The mesosystem is related to the combination of microsystems, such as family-school, colleagues-family etc. The exosystem includes systems of indirect action, such as parents' work, more distant neighbours, more distant colleagues etc. The macrosystem is related to culture, government, laws, norms etc.

Looking at development as a process, the last system is the chronosystem, which is associated with the temporal and spatial issue of facts that occur throughout the person's development. It can not be separated from the previous ones. As an example of the latest one, it is possible to cite the situation of the pandemic COVID-19. This situation also affected other systems, such as laws, culture, norms (macrosystem), same as people's work (exosystems) that changed to home environment, which ends up significantly affecting people and their homes. Given that, the work took place in another physical location and, now, it starts to influence more the mesosystems and microsystems. The author considers the interaction of
these systems with individual features in an interactive perspective, in which one influences the other and vice versa. Within the temporal issue, micro, meso and macro time are also considered. However, these will not be further explored, as this is not the focus of this work. Bronfenbrenner and Morris (2006) consider development beyond the life course, across generations. Reflecting on the current situation, one can consider how much the effects of the pandemic will continue and change world culture, a topic that, despite being relevant, will not be discussed, given that, as previously mentioned, it is not the focus of this work.

The authors describe two propositions about proximal processes. The first one concerns the need for interactions to occur over a certain period of time, being continuous and, thus, resulting in an improvement in the effectiveness of skills, knowledge and performance when engaging in individual activities or with other individuals. The second refers to the form, power, content and direction of the proximal processes in which development occurs, which vary depending on the characteristics of the person and the immediate or more remote environment. The person's characteristics appear as an element of influence in the process and as a result of the interaction. Based on the reflection presented by the authors, it is possible to design an intervention proposal that considers the development of social skills linked to academic ones in order to promote contextualized development and context with development. Therefore, collective interventions seem to present themselves as the best alternative for the practice of social interactions.

It can be said that the main focus of the bioecological model is the process, not the contextual elements related to people's responses, with the proximal processes being those of recurrent interaction, which can generate, over time, skills, knowledge, motivations and social abilities. Thus, it is considered that people's characteristics function both as an indirect producer
and as a product of development. Proximal processes vary systematically, in conjunction with the characteristics of developing people. The processes occur in order to alter the outcome of development, considering continuities, social changes and the historical period in which the person lived (Bronfenbrenner & Morris, 2006).

Interventions can be a way of working towards non-inferiorization of people considered “different”, associated with actions that make use of content in a contextualized way connected with everyday life, and considering them as part of interactional and communication processes. Consequently, peoples activities act in the process of internalizing knowledge (Vygotsky, 2009), working on learning through social practices. Therefore, it is suggested that interventions include aspects of social interaction. From this perspective, it seems logical to apply psychosocial or psychoeducational interventions in groups, in order to act not only on the person, but on the system in which they are inserted, mainly family and school. However, individual case study interventions are equally relevant for better understanding the phenomenon and the specificities of each one.

The objective of this work is to search for empirical articles on interventions in the educational field that were related to the theoretical basis of the bioecological matrix of the model proposed by Bronfenbrenner. Such interventions should focus on developing academic and/or social skills in school children in an interactive procedure.

2. Method

This paper is an interventional integrative review of articles that work on the development of social interactional and/or academic skills within the school context with a focus on children.
The objective was to identify, analyze and describe interventions that considered Bronfenbrenner's bioecological model as their basis. In this way, the analysis will also take the model into consideration.

The searches were carried out in January 2020, with descriptors in 3 languages: Portuguese, Spanish and English. In all searches, the descriptors "Bronfenbrenner" and "interaction" were considered in any position in the text. Between the searches and the group of keywords, the AND connector was used. However, the return of records does not always seem to meet this connector criteria. Given that the aim was to find interventions, all searches were carried out with the word "intervention" in the title position, associated with some characterization. The characterization descriptors associated with the title were: "psychosocial" "mathematics", "psychosocial", "psychoeducational", "mathematics", "reading", "writing", "learning", "social skills" and "social". The number returned was 59 records in total. Using the descriptor "social", there was 1 occurrence in Spanish of the 39 found, being the remainder in English. "Learning" appeared in second place, with 11 articles, all in English, of which 3 were selected. The term "psychosocial" returned 4 articles, of which 75% are in English. The descriptors "mathematics"\(^1\) and "reading" returned 2 and 3, respectively, both in English. The other descriptors did not return records.

Within the initial proposal, the first characterization descriptors in the title next to the descriptor "intervention" were: "psychosocial" AND "mathematics". The lack of feedback led to the expansion of more generic descriptors, such as "psychosocial" and, later, "psychoeducational". Next, we opted to search for more specific interventions, using the descriptors "mathematics", "reading", "writing", "learning", "social skills" and "social".

\(^1\) The descriptor "mathematics" was used instead of "maths" because it returned better results.
The selection of articles was carried out in two stages. The first occurred in a more rigorous way, considering exactly the following criteria: only empirical articles from a school context with activities within the school or related to it; intervention focused on children and that was not aimed at children with autism or brain injuries due to their specificities. Furthermore, the focus of the intervention should be academic and/or social skills aimed at children's interaction. The feedback should consider variables or elements of the intervention relating to learning issues, cognitive functions or behaviors that influence learning. The articles should also aim to evaluate the intervention, which considered Bronfenbrenner's model in its theoretical basis.

In the second stage, articles were included whose main objective was not necessarily the development and evaluation of the intervention, but because they addressed different perspectives on the application of Bronfenbrenner's model, whether in the analysis, in the theoretical basis of the intervention or in the interactional issues of the systems, as long as they maintained proximity to inclusion criteria. Interventions that appear to operate in Bronfenbrenner systems were also included, considering that many do not clearly state the theoretical choice of intervention in the text. Those articles whose theoretical basis was explained in models other than Bronfenbrenner's would not be included, same as in the case of searches returned in the search in which Bronfenbrenner was only used in arguments or references.

Figure 1 presents in detail the number of records returned in each search, as well as the number excluded and reincluded.
Figure 1 - Diagram of the Process carried out in the Search and Selection of Articles.

- [title] "psicossocial"/"psychosocial"/"psicossocial" AND "intervention"/"intervention"/"intervención" AND "mathematics"/"matemática"/"matemática" AND [anywhere] "Bronfenbrenner" AND "interaction"/"interaction"/"interacción" (n = 0)
  - Result removed by repetition - exclusion criteria (n=1)
  - Results removed for not meeting inclusion criteria (n=3)

- [title] "psicopedagógica"/"psychoeducative"/"psicopedagógica" AND "intervenção"/"intervención"/"intervención" AND [anywhere] "Bronfenbrenner" AND "interação"/"interaction"/"interacción" (n = 0)

- [title] "matemática"/"mathematics"/"matemática" AND "intervenção"/"intervention"/"intervención" AND [anywhere] "Bronfenbrenner" AND "interação"/"interaction"/"interacción" (n = 2)
  - Result removed due to not meeting inclusion criteria (n=1)

- [title] "leitura"/"reading"/"lectura" AND "intervenção"/"intervención"/"intervención" AND [anywhere] "Bronfenbrenner" AND "interação"/"interaction"/"interacción" (n = 3)
  - Result removed due to not meeting inclusion criteria (n=1)

- [title] "aprendizagem"/"learning"/"aprendizaje" AND "intervenção"/"intervención"/"intervención" AND [anywhere] "Bronfenbrenner" AND "interação"/"interaction"/"interacción" (n = 11)
  - Result removed by repetition - exclusion criteria (n=1)
  - Results removed for not meeting inclusion criteria (n=8)

- [title] "habilidades sociais"/"social skills"/"habilidades sociales" AND "intervenção"/"intervention"/"intervención" AND [anywhere] "Bronfenbrenner" AND "interação"/"interaction"/"interacción" (n = 0)

- [title] "social"/"social"/"social" AND "intervenção"/"intervention"/"intervención" AND [anywhere] "Bronfenbrenner" AND "interação"/"interaction"/"interacción" (n = 39)
  - Results removed by repetition - exclusion criteria (n=3)
  - Result removed for no access to full text - exclusion criteria (n=1)
  - Results removed for not meeting inclusion criteria (n=34)

- [title] "social"/"social"/"social" AND "matemática"/"math"/"matemática" AND "intervenção"/"intervention"/"intervención" AND [anywhere] "Bronfenbrenner" AND "interação"/"interaction"/"interacción" (n = 0)

- Results removed for not meeting inclusion criteria (n = 47)
  - Results removed due to meeting exclusion criteria (n = 6)

- Potentially relevant full articles retrieved (n = 6)
  - Full articles excluded for being ineligible (n=53)
  - Full articles included (n = 5)

- Total selected full articles (n = 11)

Source: Own Authorship
The target audience for the interventions were children related to the school context, considering social interaction. Interventions that act on cognitive development, aiming to prepare for school, were also considered. The focus of the intervention was centered on typically developing children. Those studies in which the main focus was only on the teacher or parents were disregarded. On the other side, given the bioecological model, those in which involved parents and teachers with kids were considered. For the inclusion of the article, the school context criterion was considered when it had some relationship with academic, cognitive issues, readiness for literacy or behaviors that influence learning. For those articles that presented some guidance or intervention process at home, it would be necessary for the target child of the work to be in a school context.

Research with a target audience of babies, adolescents and adults was disregarded, due to their biopsychological specificities. For babies or very young children, only longitudinal surveys that followed the child until they started school were included. Within the exclusion criteria, incomplete, inaccessible, or repeated texts were excluded.

The results of the selected articles are found in a table, they are listed in the next section.

3. Results

The results are presented at Table 1. Line 1 to 5 represents the found articles in the first stage, and from 6 to 11 there are those papers reinserted at the second moment. The fifth column in the first group of the table presents the "description of the intervention" and in the second one is the "work method" column.

The first column displays the name of the article. In the second column, the theoretical framework is mentioned, in which it is possible to verify the
bioecological model and, in some cases, the association with other models. In parallel, the systems involved are mentioned, which are the focus of the intervention. For the purposes of this work, no distinction was made between the ecological or bioecological model, as some authors use the two terms as synonyms. The third column presents the objectives of the work. In the fourth column, the participants and the research method are described. Finally, in the last column, the main results and conclusions presented by the research authors are described.
### Table 1 - Result of the article selection based on the inclusion and exclusion criteria.

<table>
<thead>
<tr>
<th>N</th>
<th>Article (year)</th>
<th>Theoretical Reference</th>
<th>Goals</th>
<th>Description of the work method / Description of the intervention and participants</th>
<th>Main Results and Conclusions</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Increasing Family Mathematics Play Interactions Through a Take-Home Math Bag Intervention (2019)</td>
<td>Bronfenbrenner</td>
<td>To evaluate the MathPack Project to improve family interactions related to mathematics.</td>
<td>Distribution of the MathPack (a kit with a set of activities) for each child, where they spent 1 week with the kit and families played at least once a week, with 1 domain per week: number, algebra, geometry, measurement and analysis of data. Pre and post assessment: observations and interviews about mathematical beliefs.</td>
<td>Positive results despite limited sample size. Increased interactions between parents and children using mathematics. The MathPack product provides this increase and the creation of strategies by parents.</td>
</tr>
</tbody>
</table>


| 2  | Delayed Effects of a Low-Cost and Large-Scale Summer Reading Intervention on elementary School Children's Reading Comprehension (2016) | Hybrid approach with theoretical and empirical basis. Bronfenbrenner Memosystem between parent-child and teacher-child microsystems | To show the results of an intervention, the effect of 9 months of an intervention on reading comprehension and examine any effects of the program. | 59 schools, 463 classes. Randomized controlled study. Experimental group received the READS intervention (teachers give guidance on reading comprehension to children, with an after-school event at the end about literacy with the family, reading assignments during the summer holidays at home). The control group had math lessons. Random selection of | There was a statistically significant difference between the groups. Experimental group read 1.1 more books. Children with an increase in summer reading performed better on reading tests, indicating an improvement in reading comprehension and a reduction in the drop in reading performance during summer vacations. The subsequent tests showed better results than the immediate tests, |

<table>
<thead>
<tr>
<th></th>
<th>Situated learning, professional development, and early reading intervention: A mixed methods study (2019)</th>
<th>Bronfenbrenner Microsystem: teacher – student</th>
<th>Intervention focused on teachers, evaluating student-teachers. Intervention with teachers to analyze results in students.</th>
<th>The selection of students was made by teachers: evaluation and analysis of students, separated into 2 groups: below average and average/above. Children from kindergarten to 2nd year. Intervention applied to teachers so that they could improve their level of providing guidance to students, monitoring their level of development in early reading. Multilevel mixed method: 2 levels - students (quanti pre- and post-intervention assessment) and teachers (quanti-quali with semi-structured interview, intervention documents, questionnaires: socio-demographic, self-efficacy pre and post intervention).</th>
<th>In the activities worked on, there were significant differences between control and experimental groups. In some activities there were differences according to the grade. In most activities the effect was greater for kindergarten children. In general, the intervention proved to be effective for the experimental group. Teachers had an increase in their self-efficacy average. Challenge: intervention in the time of the instruction day and individualized teaching.</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td></td>
<td>Bronfenbrenner Microsystem: teacher – student</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Parents supporting learning: a non-intensive intervention supporting literacy and numeracy in the home learning</td>
<td>Bronfenbrenner Microsystem: parent-child</td>
<td>To measure the impact of an intervention aimed at improving the quality of literacy and</td>
<td>Quasi-experimental study, with parents of 113 children. Assessment: pre, during and post-intervention. Selection: presence in the 1st. orientation session. Individual sections for parents with guidance and the delivery of</td>
<td>The groups were separated according to the parents who attended the meeting, so there may be a bias. Children in the immigration process have additional effort to acquire the English language at the same</td>
</tr>
</tbody>
</table>
environments (2016)

numeracy at home, in addition to checking how the intervention was received by parents.

a story book and a counting game. Parents were advised on the importance of a home environment focused on learning, counting principles and dialogical reading (HLE – home learning environment)

Measures: children's cognitive data and evolution of work applied to caregivers.

Favorable learning environments at home are a predictor of cognitive development.

| 5 Parent Engagement and School Readiness: Effects of the Getting Ready Intervention on Preschool Children's Social-Emotional Competencies (2010) | Bronfenbrenner | To report the results of the “Getting Ready”, whose objective is to promote school readiness in more vulnerable children and their parents. |
| 220 children aged 3 to 5 in a school preparatory institution. Participants divided into control and experimental groups divided by class. Longitudinal research lasting 4 years. For native Spanish speakers, with material/assessment/term translated into Spanish. The intervention: create shared responsibilities between parents and teachers for children's routines and learning. Training with parents from both groups, to improve the quality of interactions and learning experiences in daily routines, in addition to guiding parents to be more responsive and welcoming, supporting the child's autonomy. Depending on the |  | Statistically significant differences were not found between the control and experimental groups in learning skills. But the findings show that the experimental group had relatively greater gains than the control group in interpersonal skills. |
| Descriptors: [title] “intervention” AND “psychosocial” AND [any] “Bronfenbrenner” AND “interaction” | 6 | Construyendo posibilidades: intervención psicosocial en la escuela (2007) | Constructionist-based systemic model and Bronfenbrenner mesosystem mediated by a social worker in the Microsystems: Family - school, child - child, mother - child | To show practices and reflections on these professional practices of social workers in the school environment, which meet the child’s context (school-family), bringing an egalitarian and reciprocal practice | Multiple case studies (3 cases): Social worker asks open questions so that one of the pairs talks about the situation and the other listens, then the other side speaks, based on empathy (reflective dialogue and collaborative context): mediation between family/school; family/child and child/child. One side listens to the other, working on judgment and understanding on the other side | Through conversation, it is possible for couples to understand each other. Reformulate the emotional experience in the construction of individual realities. The reframing of relationships. |
| Descriptors: [title] “Intervention” AND “math” AND [any] “Bronfenbrenner” AND “interaction” | 7 | Using a bioecological framework to investigate an early childhood mathematics education intervention (2018) | Bronfenbrenner bioecological model Microsystem: parents-child and educators-child | To evaluate the results of educational intervention in Australia | 35 early childhood education educators and 37 parents. Qualitative analysis of interviews made by phone with parents and early childhood educators. Asking them to describe the situation, according to some pillars about participants in the “Let’s Count” (constructed by a group of children involving parents and educators through proximal processes | The analysis of an intervention under Bronfenbrenner's bioecological approach: Results are described according to the pillars of the model (process-person-context-time), and the interview. The authors describe that adults report how much the program is bringing a predisposition in children's attitudes towards mathematical |
between family members and educators, who guide them with mathematics-related activities in daily contexts).


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<th>No.</th>
<th>Description</th>
<th>Methodology</th>
<th>Participants</th>
<th>Findings</th>
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<tr>
<td>8</td>
<td>Does a Preschool Social and Emotional Learning Intervention Pay Off for Classroom Instruction and Children’s Behavior and Academic Skills? Evidence From the Foundations of Learning Project (2013)</td>
<td>FOL (Foundations of Learning) - Evidence-based parenting practices and Bronfenbrenner</td>
<td>51 schools: teachers and low-income children (4 years old). Experimental. Intervention focused on the performance of coercive teacher-student cycles, so that teachers act in positive practices and limit the child’s aggressive and disruptive behavior. Individualized child-centered care for those who did not respond after intervention. Pre and post data collection: with parents and teachers, classroom observations and individual behavior notes for each child.</td>
<td>It has improved instructional time and the way teachers deal with student problems, without changing the way they teach. Interaction between students improved, optimizing instructional time both by acting on disruptive behaviors and engagement related to learning compared to the control group: some differences in the behavioral aspects, the control group maintained more oppositional behaviors. There was no significant difference in the learning aspect, the authors suggest training in teachers’ linguistic interactions.</td>
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<td>9</td>
<td>Design-Based intervention Research as the Science of the Mesogenetic methodology, cultural-historical activity theory (Vygotsky,</td>
<td>To describe some ways of using the historical-cultural activity</td>
<td>Children selected by teachers, according to reading difficulties (2nd to 5th year). Intervention method: system of interactive activities with children</td>
<td>Children’s results improved after intervention, as teachers reported that students improved on assessments. Situations that are not under the control of the</td>
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<td>Doubly Artificial (2016)</td>
<td>Bronfenbrenner, Cole) Learning - artificial science (Hebert Simon) doubly artificial development dynamics microsystem - undergraduate students - child macrosystem - through analysis</td>
<td>theory that researchers are working on, in order to explore, understand and enhance learning. The article also appears to focus on the process of developing the intervention over time with reading difficulties and undergraduate students, through games. The evaluation was through feedback from teachers. Research development and analysis method: Mesogenetic methodology, considers Macro situation (political-societal and economic changes), Meso (conception, birth, life and death of the learning activity designed in its institutional and societal ecology), Micro (Learning processes and development of people in activities) researchers occurred and an analysis of the influence was carried out. For example, the site ends the project due to security concerns. The authors considered in the macrogenetic analysis the change in coordination due to external events favored the project.</td>
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10 | Breaking the cycle of Deprivation: An Experimental Evaluation of an Early Childhood Intervention (2012) | BowlBy Attachment Theory. Bioecological development and Bandura 's social learning theory Mother-child microsystem | To evaluate the statistical analysis of the Irish Preparing for Life (PFL) project and describe it. Monitoring mothers in vulnerable situations, from pregnancy until. 28 community groups. The focus was to offer support to level the deprivation caused by socioeconomic issues, with the aim of breaking this cycle. Experimental and quasi-experimental (one control group and 2 experimental groups, depending on frequency in monitoring and guidance). The objective of the intervention was to prepare the child for school Regarding the program, it proved to be quite effective in terms of cost-benefit, with a long-term financial return on investment. The perceived social returns were: reduced government financial assistance, reduced childhood abuse, improved prenatal health, improved readiness, and fewer childhood injuries. |
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<th></th>
<th>Marte Meo and Coordination Meetings (MAC): A Systemic School-Based Video Feedback Intervention – A Randomized Controlled Trial (2019)</th>
<th>Bronfenbrenner</th>
<th>The study evaluates and compares 2 interventions - SAU (Service as Usual) and MAC (Marte Meo and Coordination Meetings)</th>
<th>99 children aged 3 to 12 years old, in vulnerable conditions, with behavioral problems. Experimental, randomized, with pre- and post-intervention data collection. MAC – training of school staff and provision of therapists to coordinate meetings, when needed a family therapist was included. SAU – family and teacher support – support ranged from no support to more expensive activities that required more resources.</th>
<th>There were statistically significant differences between MAC and SAU. Teachers reported a preference for MAC. According to parents, both methods proved to be effective. SAU focused on more costly problem management. The authors describe the study as promising, considering it was carried out in a natural environment.</th>
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Source: Own Authorship.
4. Discussion

Referring to Table 1, the first article, Linder & Emerson (2019) present work that covers practical mathematics issues through interactions between parents and children. The research works and evaluates beliefs and practices regarding mathematics. The authors carried out an intervention. However, it would have been interesting if they had presented quantitative data measures regarding knowledge of mathematics. The authors discussed interactional issues, addressing the quality of interactions in the parent-child microsystem and involving mathematics through the intervention activities provided by the Math Pack package. Within the systems considered in the bioecological model, Kim and colleagues (2016) (article 2) present a low-cost intervention as it is a proposal to be carried out during the vacation period, which seems to be an interesting option, and it can aggregate others interventions during the classes. In the article by Amendum & Liebfreund (2019), (article 3), the researchers develop work with another focus within the bioecological model structure, which considers a development program for teachers and intervention with instructional guidelines. In this proposal, there are a series of interactions and some of the instructions are individualized for students who have difficulty, which seems to be ideal considering the specificities of the difficulty, even to better understand the needs of those students.

Articles 4, 5 and 11, with Niklas and colleagues (2016), Sheridan and colleagues (2010) and Balldin and colleagues (2019), respectively, present examples of work in the family-child microsystem, in order to work on the interaction between both. Bringing the possibility of a more conducive environment for learning, so that the latter adds the work in partnership between parents and education professionals. In the latter, a comparison
was made between 2 support systems offered to the community: MAC and SAU, differentiated according to the type of support. These articles bring the aspect considered by Bronfenbrenner to the importance of collecting data from different systems, in this case different microsystems. This way, analysis in different dimensions is possible.

In the sixth article, Gastañana Moreno (2007) presents a work on mediating relationships and the person doing the mediation is a social worker from the school itself. The intervention took place at the mesosystemic level, between the family and school microsystems, through a reflective dialogue in which it was possible to listen to each side in relation to the other. Another case presented was in the family-child microsystem, through situations in which parents heard statements from their children, generating sensitivity on the part of the family and the school itself. Additionally, dialogues were held between some children and others. Intervening action in conflicts through dialogue, in which each child brings their perspective of the situation, proved to be quite effective. The main focus was on understanding between peers.

The article presented by Perry and Dockett (2018) (article 7), despite not specifically addressing the intervention, focuses on the use of a Bronfenbrenner model to evaluate the results of an existing intervention. The article does not present a range of details of the intervention, but addresses an analysis based on the structure of the bioecological model of an educational intervention focused on mathematics. The intervention work was carried out in Australia, with the aim of working on important predictive elements for the child's development before they enter school. The family works with children who are in unfavorable social conditions and in a vulnerable situation, as they are at a disadvantage compared to other children with better financial conditions. The research evaluates the
effectiveness of the intervention, also considering aspects of the bioecological model. The evaluation does not present a methodological description of the analysis and the intervention is also not presented in its methodological details, in addition, there is the absence of references and research regarding the intervention. Interpretations are presented of which elements of the intervention fit into the pillars of the bioecological model and address the change in perspective and the new vision of the interaction of family microsystems and educators involved in the project. Because the article provides examples of applications, it presents guidelines for new interventions.

In the article by Morris and colleagues (2013) (article 8), the authors present research in which they evaluate the change in the learning environment. Researchers measure instructional time whether changes occur when the intervention – focusing on children's disruptive behaviors – is carried out in parallel. The researchers hypothesize that improvement in the environment can occur through an intervention that addresses socio-emotional issues. This research, despite the Bronfenbrenner model not being explicit, is quite characteristic and, furthermore, the work presents evidence of a theoretical basis and the first author is the same one who published on the bioecological model Bronfenbrenner and Morris (2006).

Cole and colleagues (2016) (article 9) created a framework for taking into account Bronfenbrenner systems and Vygotsky elements, the mesogenetic methodology. The article presents data from the intervention and meta-research, in which analyzes of the research itself are carried out based on the model developed. Furthermore, the authors describe ways of using cultural-historical activity theory. The intervention considers after-school learning environments, composing a microsystem through environmental changes. In the analysis within metaresearch, the authors
discuss relationships between global facts that affected the project, bringing a macrosystemic relationship.

In his article, Doyle (2011) (article 10) presents research carried out in Ireland. In this research, the concept of readiness is viewed holistically, including cognitive development, physical health and motor skills, social-emotional development, behavioral skills, language development, and emergent literacy. The research also describes how much the issue of vulnerability can hinder a child's development. The research describes a program that attempts to “equalize” social issues, in the sense of support offered to mothers in vulnerable conditions. The research is a longitudinal study that follows mothers from the period of pregnancy until the child enters school.

5. Final Considerations

This review aimed to identify interventions in the educational field that worked with the theoretical basis of Bronfenbrenner's (2011) bioecological matrix, whose focus was the development of academic and/or social interactional skills related to learning in children. The initial proposal would be to search for interventions aimed at academic skills associated with mathematics. However, the scarcity of feedback led to the expansion of descriptors. The purpose of the research was to look for input from other interventions to develop an intervention from this perspective. The descriptors were selected following a flow of greater generality towards academic and, later, social interactional skills, maintaining the connection with the development of academic and/or social interactional skills in Portuguese, Spanish and English. As the proposal involved the analysis of interventions, the main focus was on articles that had some structured
The intervention involved: a methodological structure for procedural search. The review retrieved 59 articles between 1999 and 2020, with search returns in English and Spanish – highlighting 57 in the English language. 11 articles were selected, in which 6 were carried out in the United States, 2 in Australia and 3 in Ireland, Sweden and Spain. Therefore, only 1 of the selected articles was written in Spanish and the others were in English. These data lead us to suggest the need for more research or publications with interventions that address academic issues related to learning and development of social skills based on Bronfenbrenner’s (2011) bioecological model.

The results of the research were significantly varied, so that the use of the model was not always evident in the research or in the development of the intervention itself. In general, the articles were quite heterogeneous, which made the review work difficult. Among the selected articles, despite the majority focus on children, 2 worked directly at school with academic content in the literacy phase or later. Another 2, despite occurring in a school context, had as their main focus the socio-emotional development associated with the interactional issue. The majority – 6 of those selected – focused on periods of child development preparatory to school or aimed at preschool. Among the selected articles, 8 addressed interventions related to cognitive issues, related to learning regarding academic issues. In 3 studies, the main focus was predominantly interactional with a strong weight in child’s behavior that could affect learning in the future.

Some of the work addresses the influence of socioeconomic issues as a negative consequence in the development and learning process. Social vulnerability affects negatively, and intervention is a way to reduce these differences. More than half of the studies reported this intention in the intervention, with the aim of minimizing the effects of socioeconomic differences. Considering this factor, psychosocial interventions would be an
alternative to work on socio-emotional development and academic issues in the development process from childhood, justifying the implementation of interventions with a school focus.

Based on a bioecological model, and regarding all found research, one suggestion would be to collect data from more than one system, to evaluate different systems of the person as described by Bronfenbrenner (2011). This is a way to get a more complete assessment.

It would be interesting if there is research that is carried out during the literacy period, or later, to help with socioeconomic differences between children that are already in the schooling process. Given that, there was no return of work from Brazil, the relevance of research based on the bioecological model of Bronfenbrenner (2011) is highlighted. Among the returned searches, only 2 studies with case studies were found, a factor that reflects the need for case studies to better understand the phenomenon of the systems in which the child is inserted.

As the initial proposal was focused on academic mathematics and social interactional skills, the need for interventions with this perspective is also suggested. Both interventions through case studies that work with children and collective interventions with schoolchildren could add to the research. In the case studies, the micro and mesosystemic actions of family and school could be worked on, providing a better understanding of the phenomenon of acquiring academic and social interactional skills. It should be noted that the chronosystem is present in all cases due to the fact that it occurs for a certain period of time, even within the proximal processes. Complementarily to this and in a more comprehensive way, interventions at the school of the child participating in the case study would also be an expansion of the systems involved, especially if the intervention involves greater contact with the parents of each child.
References


