

# The Association Between Reading and Emotional Development: A Systematic Review

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## Abstract

Reading practice is associated with numerous psychological benefits. However, its influence over individual emotional dimensions has generally been underestimated by research. Only recently has it been recognized across different developmental stages but evidence is still scarce. The aim of this systematic review is to shed light over the association between reading and the several (and sometimes hardly distinguishable) socio-emotional constructs that we have identified in literature: interpersonal skills and prosocial behavior; emotional and behavioral symptoms; emotional regulation and expression; empathy and theory of mind; emotional knowledge and comprehension; and emotional responses. A total of 50 studies were analyzed, including all age groups, various settings, research drawings, and different emotional constructs in order to create a comprehensive view of the association between reading and emotions. Results show that overall reading practice has a positive impact on socio-emotional development, whatever its declination, regardless of age, gender or setting of implementation.

**Keywords:** reading; read-aloud; emotion; socio-emotional competence; emotional development

## 1. Introduction

Reading is based on interactive processes between the reader and the text (McCreary & Marchant, 2017); indeed, while involved in this activity, the reader creates meaning and decides what information is essential. As underlined by McCreary and Marchant (2017), reading is closely linked to critical thinking (Abu-Shihab, 2011) and requires a great number of abilities. It fosters a better comprehension of information (Wallot, O'Brien, Haussmann, Kloos, & Lyby, 2014) and the use of learning strategies (Lim, Bong, & Woo, 2015). The cognitive benefits of reading are well known, for example, on expressive and receptive language (Mendelsohn et al., 2001), vocabulary learning and story comprehension (Bus, Takacs, & Kegel, 2015; Dore et al., 2018) or problem-solving and communication (Murray & Egan, 2014). However, although still scarce, recent empirical research has underlined that reading also has positive impacts on other abilities related to socioemotional competencies, in particular those identified with the label of “social understandings”. These refer to the ability to understand and sympathize with others’ emotions, cognitions and motivations, which is crucial to fostering the development of adaptive relational resources (Carpendale & Lewis, 2006). Moreover, these elements are part of the broader area of socioemotional competence, that includes important skills needed to manage our inner states and to relate to others. These abilities are developed in responsive and safe environments that involve reading practices as a key instrument to support this growth (Santos, Fettig, & Shaffer, 2012; Shonkoff & Phillips, 2000).

### 1.1 A difficult Concept to Define

“Socioemotional competence” is an umbrella term. Under this label are often grouped many different psychological aspects that sometimes overlap each other, such as “social understandings”, “empathy”, “emotional intelligence”, “Theory of mind”. These are some of the most common concepts. However, even defining these singular terms can be complex. Unclear or divergent descriptions of empathy are common across research literature, as well as inconsistent means of measuring it (Gerdes, Segal, & Lietz, 2010). However, before proceeding, we will try to set a definition for each of these concepts. With “Empathy” we mean a construct that includes affective (the emotional reaction toward or with a person or a character) and cognitive dimensions (the competence to assume others’ perspective or imaging oneself in the place of another person or character) (Junker & Jacquemin, 2017). Moreover, empathy is not an innate

ability: instead, it is something that everyone can learn and practice in their environment (Stepien & Baernstein, 2006). The concept of “Theory of mind” was introduced by Premack and Woodruff in 1978 and is meant as the ability to attribute mental states (thoughts, knowledge, hopes, emotions, desires) to oneself and others and to foresee one's own and others' behavior based on these states (Meins, Fernyhough, Arnott, & Leekam, 2013). As regards to “Emotional Intelligence” we will refer to Bar-On model (2006), that describes this concept as a number of interrelated emotional and social skills associated to one's ability to understand and manage emotions, to relate with others, to adapt to different situations, to cope with personal and interpersonal problems and with daily challenges. These competencies have appeared to predict better physical and psychological health and better social and work performances (Bar-On, 2006). Keeping this complexity in mind, we chose to consider all these aspects in our research. Thus when using the terms “socioemotional development” or “competence” we will broadly refer to the general ability to understand and infer one's own and others' inner states, such as emotions, thoughts, desires, and motivations, and to flexibly implement the most appropriate behavior to respond, in an adaptive way, to singular interpersonal exchanges. This definition recalls Fonagy and Target's concept of “Reflective Function” (1997), that includes emotional and cognitive abilities implicated in our social interactions.

### *1.2 Reading and Socioemotional Development*

Literature is crucial for empathy growth (Volpi, 2011). The relationship between reading and socioemotional development is clear over different lifetime periods and even in early childhood. Through shared book reading toddlers may form social bonds, closeness and attachment. In this overlap of social and emotional dimensions, toddlers begin to construct adaptive ways to communicate with adults and become involved in social processes. Written and oral stories build the framework to foster socio-emotional abilities for empathy and relationships (National Research Council, 1999). Thus, exposing children to books and stories promotes the acquisition of reading and emotional skills that, in turn, help them succeed in school and beyond (Ayotte et al., 2003; Elbaum & Vaughn, 2001; Reschly, 2010). Research based on theory of mind tasks has shown that the more four to six-years-olds are exposed to reading experiences provided by their parents, the better they are at understanding that others might have different mental states from their own (Adrián, Clemente, Villanueva, & Rieffe, 2005; Mar, Tackett, & Moore, 2010). This association seems evident also in school-age children, even if studies on this life period are scarce (Kozak & Recchia, 2019). One recent study on ten-year-olds revealed that reading literary fiction leads to a slight - but significant - increase in social understanding in comparison to reading popular fiction or nonfiction (Wulandini, Kuntoro, & Handayani, 2018). Another study focused on primary school students (Batini, Bartolucci, & Timpone, 2018) showed that an intensive training of reading aloud fostered an improvement in empathy and the ability to understand emotional responses to situations and circumstances. In regards to adulthood, research on university students (Mar, Oatley, Hirsh, dela Paz, & Peterson, 2006; Mar, Oatley, & Peterson, 2009; Mumper & Gerrig, 2017) has shown positive associations between reading in one's free time and social understanding. Moreover, each reading experience has different characteristics; reading fiction, in particular, seems to stimulate more empathy than reading nonfiction texts, whereas reading literary books has shown to lead higher levels of empathy than popular texts and genre fiction (Djikic, Oatley, & Moldoveanu, 2009; Kidd & Castano, 2013, 2017). Also, first-person narrations are likely to foster empathy (Oatley, 1999), while approaching literary fiction through digital formats seems to decrease this effect (Mangen & Kuiken, 2014).

However, literature is not unanimous in supporting this sort of evidence and debate is still in course about the role of reading in emotional development. Some studies (Panero et al., 2016; Samur, Tops, & Koole, 2018) fail to replicate Kidd and Castano's findings (2013) that reading literary fiction primes improvements in theory of mind skills, though underlining a positive association between familiarity with fiction and mentalizing.

On the other hand, a meta-analysis led by Dodell-Feder and Tamir (2018) on 14 studies strengthens the association between reading (specifically fiction reading compared to nonfiction reading) and social cognition improvement. This finding supports the evidence that fiction reading improves social cognition. However, it is not clear to what extent reading has a significant effect on emotional development, which is the underlying factor involved in this association. We will discuss this point in the next section.

### *1.3 Theoretical Framework*

As illustrated by Kozak and Recchia (2019), several explanations have been provided to these findings. The first one is that reading is a simulation of the real world: by engaging with fiction, readers may undergo experiences vicariously through the protagonists' lives (Mar & Oatley, 2008). Gerrig (1993) referred to this phenomenon as “transportation”: the reader is transported in the world created by the author. Reading allows us to simulate characters' experiences in different situations and to understand their inner states. Indeed, successful social interactions are based on the ability of the individual to understand what others experience in a certain situation (Mar & Oatley, 2008). A logical consequence of this statement is that the more characters a reader knows, the more he or she will become an expert of others' inner

functioning: that is, social understanding skills are developed vicariously (Kozak & Recchia, 2019).

Even if the simulation theory represents one of the most quoted ways to explain how underlying mechanisms work on the emotional experience of reading, some other processes could be substantially involved. A first example is given by Mumper and Gerrig (2019), who have theorized three main processes affecting the emotional content of the readers' narrative experience. Firstly, while we are reading, we draw some automatic inferences on the basis of a memory process called "resonance": when a character experiences a negative emotion or some kind of unpleasant situation, we experience the same emotion. This process is meant to give us a more detailed representation of the scene, drawing from long-term memory to empower the story's comprehension and involvement. Secondly, the mechanisms generating emotion and evaluation of reality affect the emotion we feel for the stories' characters: for example, unpleasantness or pleasantness, self or other responsibility, situational control and level of certainty or uncertainty about what will happen next. Thirdly, this narrative participation could decisively characterize the emotional experience of reading. If the story provides a scene in which there could be a potentially dangerous event in the plot, the narrative immersion leads us to switch on a kind of "mental warning" in which we experience the same (negative) emotions that we would feel if such a scenario were to occur in real life.

A third theory is related to the emotional states evoked during reading, so that a deeper emotional engagement may foster empathy growth. In this regard, adults who reported feeling emotionally transported by a story specifically written to induce warm feelings (such as sympathy or compassion), experienced more empathetic emotions while reading (Johnson, 2012).

A fourth theory focuses on readers' opportunities to infer characters' mental states. Since social understanding is based on the same ability to make inferences on others' inner states, reading fiction may hone readers' inference skills and, consequently, foster socioemotional development. Thus, identifying with a book character allows us to infer his or her inner thoughts, feelings, and plans could be a good training technique to implement the same expertise in the real world (Mar, Oatley, Djikic, & Mullin, 2011; Mumper & Gerrig, 2017).

Another interesting contribution regarding the development of social cognition through reading exposure comes from the Social Processes and Content Entrained by Narrative (SPaCEN) framework (Mar, 2018). This theory supposes that there are two ways in which reading stories can have a positive influence on the development of social skills. Firstly, stories can improve mental inferencing, the main tool to evoke and update the social mechanisms through which we understand and explain the social dimension of the world. Secondly, social cognition is affected by contents presented in the stories: when the stories explicitly talk about personal aspects of the characters (e.g. personality traits), we adapt our social schemas in order to apply them to the people we meet. In this regard, Gerrig (1993) observed that the social processes involved in the comprehension of the story (e.g. theory of mind, empathy/sympathy, social memory) are the same we use to put in place in real world comprehension.

### 1.3.1 Our Theoretical Framework: A Summary

We can therefore summarize that reading has substantial power over the many mechanisms that we have enclosed in the term "socioemotional competence". Reading simulates real life (Gerrig, 1993): readers experience the characters' emotional states in the stories and train themselves to grasp and understand their own and others' emotions in a better way (Mar & Oatley, 2008). By coming into contact with the stories and the characters' emotions, a resonance process is activated in which we bring our previous experiences closer to the events of the story, giving meaning to the reading in a clearer and more precise way, living the underlying emotions more intensively and decisively characterizing the reading experience in general (Mumper & Gerrig, 2019).

This immersion in reading enables the reader's empathy (Johnson, 2012) and the inference of other people's mental states. These are fundamental skills to adapt to the real world (Mar et. al, 2011; Mumper & Gerrig, 2017). In line with this point, the SPaCEN explanation (Mar, 2018) also highlights how stories foster the development of our mental capacity and social cognition. These different contributions have as a key assumption that reading has a strong influence over emotions and are able to highlight various aspects of this association. Reading allows us to experience, know and recognize emotions, to understand and grasp our own and others' emotional states, as well as to re-propose these socio-interpersonal skills in real life, improving our emotional and behavioural skills and favouring a continuous adaptation to the environment.

### 1.4 The Purpose of This Study

Our study is rooted in the debate of literature about the role of reading in fostering emotional development. On the basis of the above theoretical considerations, the purpose of this study is to investigate the association between reading and emotional development across the recent psychological and educational literature, trying to add evidence to this still little explored research field. For this purpose, following an overview of the whole life path, with no any age restrictions,

we collected empirical studies in which the association between reading and emotional development was explored, in order to investigate whether reading leads to improvements in emotional dimensions. As Kozak and Recchia (2019) discussed, there is a lack of studies concerning school-age: for this reason, our review tries to fill this gap by adding evidence of this life period.

## 2. Method

### 2.1 Retrieval of Studies and Inclusion Criteria

In order to obtain studies examining the effects of reading on emotions, the PICOS method was taken as a reference (Moher, Liberati, Tetzlaff, & Altman, 2009). In this approach, each letter identifies an element of the research question: participants (P), intervention (I), comparisons (C), outcomes (O) and study design (S). This method led us to define the research question in a structured way by establishing seven inclusion criteria. The first criterion was to select articles published from 2011. This time range was chosen to focus on the most recent literature. A second criterion was to select peer-reviewed articles. All empirical studies were included: evidence based, studies based on qualitative analysis, observations or mixed methods; the purpose was to investigate the impact of all types of reading on emotions and this could be observed through numerous types of research. Moreover, since there are many different definitions and means of assessment related to emotional concepts (Gerdes et al., 2010), we decided to take into account different strategies to evaluate emotional development. Non-empirical studies were excluded. The third criterion for inclusion was language: contributions published in English, Italian, and Spanish were included, contributions published in other languages were excluded. Fourthly, in terms of populations considered, the analysis covered all ages, with no age restrictions. Studies conducted on a population with a learning disability or learning disorder were excluded from the analysis in order to focus the analysis on the impact of reading activity on emotional factors, while trying to limit the influence of other variables. Fifth, as far as the setting is concerned, all studies with home environments, labs, schools, universities or other services with an explicit educational purpose as their setting were included. The analysis focused on reading in a broad sense, and therefore no limitations were placed on the modalities and characteristics in which this activity could be carried out. As a sixth criterion, studies involving the use of individual or shared, silent or loud reading were included: reading training, reading sessions and educational laboratory based on reading. Studies that did not include reading interventions but assessed reading habits or language skills were also included. Therefore, socio-emotional development programs with an impact on reading performance were excluded. The use of reading through technological media was excluded. Studies including learning programs of a second language were also excluded. The same procedure was adopted for the emotional dimension; studies that investigated emotional development, emotional intelligence, recognition of emotions were analyzed. We identified as the seventh criterion the inclusion of skills concerning these areas and excluding results different from the objective.

### 2.2 Search strategies

This analysis was carried out in May 2020 and was conducted using two electronic databases: ERIC and PsycInfo. The ERIC research input was: (reading OR reading aloud) AND (emotion OR empathy OR emotional intelligence) AND (emotional development OR understanding of emotions) NOT (diseases OR brain loss OR disability OR autism spectrum OR syndrome OR disorder) NOT (second language). The PsycInfo research input was: (reading OR oral reading OR reading aloud) AND (emotion OR emotional development) AND (empathy OR emotional intelligence OR recognize emotion) NOT (diseases OR brain loss OR disability OR autism spectrum OR syndrome OR disorder) NOT (second language). This method of analysis has been used in previous research (Barquero, Davis, & Cutting, 2014; Salceda, Alonso, & Castilla-Earls, 2014). As shown in Figure 1, the ERIC search produced 558 results and PsycInfo search produced 220 results: 6 duplicate items were removed and the result was 772. The first analysis that was carried out was based on reading the title and the abstract of each article to identify those relevant to our criteria: 673 contributions were excluded because they did not meet the inclusion criteria, the remaining 99 articles were included. Subsequently a full reading of the articles was carried out, 33 articles that did not meet the inclusion criteria were excluded and 16 theoretical articles were used for the drafting of the introduction. The bibliographic research led to a final total of 50 studies that met the criteria for inclusion in the review of the descriptive literature.

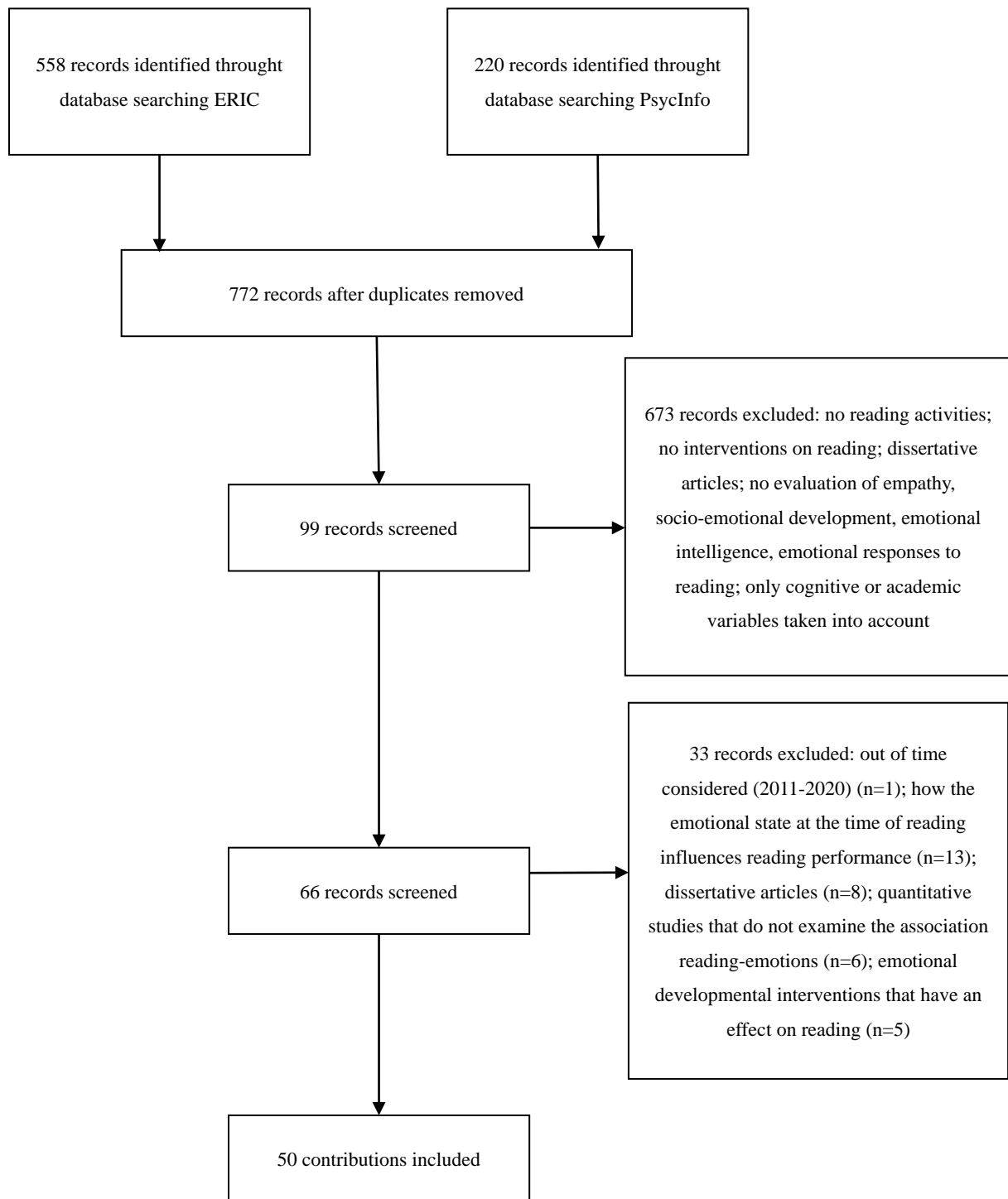


Figure 1. Study selection

### 2.3 Data Collection

The final articles (50) that have been analyzed are presented and discussed in the results. The information describing the area of intervention, the research design, the samples, the evaluation tools, the intervention and the outcomes is presented in Appendix A, B and C. Ten of the fifty articles are qualitative studies, three are case studies and two are neuroimaging studies. As regards the age group considered, Appendix A collects 13 articles including a sample of children (of which two articles had as participants children from kindergarten to primary school), Appendix B collects 24 articles with a sample of school age participants (from primary to upper high school), Appendix C collects 13 articles with a sample of adults.

### 3. Results

In line with the assumptions of the review, all the studies analyzed focused on reading and emotions variables as objects of investigation. A descriptive analysis of the results will be presented in relation to the reference age and the research design used in the studies; this description will be divided according to the three reference evolutionary periods: childhood, school-age, adulthood. Further information about research designs is reported in Tables 1, 2 and 3. Subsequently, the overall results related to reading components are presented. After that, the focus will be on the results related to emotional constructs.

### *3.1 Descriptive Results*

The samples of the total 50 studies cover an overall age range from 18 months to 73 years old. These data are based on the youngest and oldest ages considered, excluding studies that did not indicate the age range.

#### *3.1.1 Childhood*

Regarding the Childhood sample (see Appendix A), out of a total of 13 articles, 2 studies were identified on participants in the nursery age group (Betawi, 2015; Drummond, Paul, Waugh, Hammond, & Brownell, 2014), 9 studies on a sample of participants in the Preschool age group (e.g. Aram, Deitcher, Shoshan, & Ziv, 2017; Baker & Rimm-Kaufman, 2014) and 2 studies following participants' growth from the preschool to primary school (Riquelme & Montero, 2016; Riquelme, Munita, Jara, & Montero, 2013). Of the total of 13 articles, 10 studies have a quantitative research design (of which 4 with control groups), 2 are longitudinal studies without a specific intervention and 1 study has a qualitative research design.

#### *3.1.2 School-Age*

In the School-age sample (see Appendix B), out of a total of 24 articles, 14 studies involved participants in the primary school (e.g. Angantyr, Hansen, Eklund, & Malm, 2016; Beck, Kumschick, Eid, & Klann-Delius, 2012; Brokamp, Houtveen, & van de Grift, 2019), 5 studies enrolled participants in the middle school (e.g. Chisholm, Shelton, & Sheffield, 2017). One of these latter studies followed the sample till the last years of high school (Dylman, Blomqvist, & Champoux-Larsson, 2020). 5 studies focused on high school participants (e.g. Abdolrezapour & Tavakoli, 2012; Boatright & Allman, 2018). Of the total 24 articles, 17 studies have a quantitative research design, of which 3 are longitudinal; 10 studies use control groups. 4 papers are qualitative studies, of which one is longitudinal; 3 are case-studies.

#### *3.1.3 Adulthood*

Finally, concerning the Adulthood sample (see Appendix C), out of a total of 13 articles, 9 studies involved participants from the university (e.g. Glenn, 2012; Hoggan & Cranton, 2015), and 4 studies enrolled samples of adult participants not belonging to an educational level (e.g. Altmann, Bohrn, Lubrich, Menninghaus, & Jacobs, 2012). Of the total 13 articles, 4 studies have a quantitative research design, 5 studies have a qualitative research design, 2 studies use both quantitative and qualitative research designs and 2 are functional neuroimaging studies.

### *3.2 Reading Components*

The analysis of the studies allowed us to report some results on the reading components. Out of a total of 50 studies, 10 studies did not implement any specific reading intervention, they evaluated the association between reading and socio-emotional competence in other ways: Baker (2013) for example, explored the association between numerous family literacy activities conducted by fathers and mothers with their children (such as storytelling, reading books, number of books provided) and the subsequent development of socio-cognitive skills in children; in contrast, other authors measured reading skills (e.g. Morgan et al., 2012; Undheim et al., 2011), reading habits (e.g. Dylman et al., 2020; Tabullo, Jiménez, & García, 2018) and language skills (e.g. Beck et al., 2012) and their association with emotions. The other 40 studies implemented different reading interventions. Some studies conducted intensive reading training with long-term interventions; these studies implemented reading practices in various forms and modalities, such as individual reading (e.g. LaForge, Perron, Roy-Charland, Roy, & Carignan, 2018), or reading aloud through mediated, shared or interactive modalities (e.g. Abdolrezapour & Tavakoli, 2012; Betawi, 2015; Lysaker & Tonge, 2013). Some research developed comparisons between various types of reading, in order to observe the most effective one on emotional variables (e.g. Riquelme & Montero, 2016). Other research used sessions of individual or shared reading, sometimes based on a single moment (e.g. Angantyr et al., 2016; Chisholm et al., 2017), other times based on several moments limited in time (e.g. Schapira & Aram, 2019). Finally, some studies have implemented educational workshops based on reading and discussion (e.g. Chisholm et al., 2017; Gordon, 2017).

The main contexts in which the studies were carried out are the school and educational environments, considered in all the developmental periods (e.g. Brokamp et al., 2019; Grazzani & Ornaghi, 2011; Pytash, 2013; Venegas, 2019), and the family environment, particularly involved in the Childhood period (e.g. Baker, 2013; Drummond et al., 2014; Ferretti & Bub, 2017; Schapira & Aram, 2019). A further interesting clarification that emerged from the analysis of the results

concerns the reading choices made by the studies that implemented an intervention. We observe the selection of books with multicultural aspects (Glenn, 2012; Gordon, 2017; Slay & Morton, 2020; Tomé-Fernández et al., 2019), and books with relevant emotional content, with a greater frequency for reading with negative emotional contents (Altmann et al., 2012; Angantyr et al., 2016; Iacozza, Costa, & Duñabeitia, 2017; Karniol, 2012). Some studies have chosen specific contents, such as disability (Venegas, 2019), bullying and suicide (Pytash, 2013) and relevant historical events (Chisholm et al., 2017).

### 3.3 Categorization of the Emotional Constructs

As mentioned above, under the label of “socio-emotional competence” are grouped many different concepts whose borders fade and are intertwined. This phenomenon is reflected by our results. Indeed, many articles use different names to refer to the same mental process (e.g. “social imagination” and “Theory of mind”); others focus on different, singular aspects of the same, wider, emotional concept (e.g. “cognitive empathy” vs “affective empathy”). In other cases, some wider emotional constructs overlap one another (e.g. the emotional intelligence, among its several aspects, comprehends also empathetic skills, overlapping the construct of “Empathy”).

This “Babilonia Tower” is reflected even in the tools used to assess emotional components. Sometimes the same aspects are evaluated with different instruments. For example, beyond the qualitative studies, the most used tools for empathy are at least four: the Interpersonal Reactivity Index (IRI; Davis, 1983) was used in 5 studies, followed by the Empathy Quotient Test (Baron-Cohen & Wheelwright, 2004) (three studies), the Griffith Empathy Measure-Parent Report (GEM-PR; Hunter & Bech, 2003) (three studies), and the Reading the Mind in the Eyes Task (RMET; Baron-Cohen et al., 2001) (two studies). With the IRI, the Test of Emotion Comprehension (TEC) (Pons & Harris, 2000) is the most used instrument (five studies investigating emotional knowledge).

In order to better sort out our findings, we decided to decompose the wider emotional concepts and to focus on the singular socio-emotional aspects evaluated by each study, grouping our sample of 50 articles on the base of the same area of assessment (see Tables 1, 2 and 3). Referring to the theoretical background, we focused mainly on constructs associated with the emotional experience elicited by reading and the ability to infer, recognize and understand one’s own and others’ emotions and to relate to the environment in an adaptive and socially appropriate way. Thus, six labels were inferred: (a) Social-relational and interpersonal skills (prosocial behavior, cooperation, assertiveness, adaptability, social awareness); (b) Emotional and behavioral problems (such as anxiety and depression, emotional maladjustment, social problems, conduct problems, aggressive behavior, ADHD symptoms); (c) Emotional and behavioral adaptive competences (emotional regulation and expression, self-control, impulse control, emotional stability, self-esteem); (d) Ability to understand and sympathize with others’ mind (empathy, theory of mind, understanding of emotions, social imagination, social understanding, sympathy, perspective-taking); (e) Emotional knowledge (emotional vocabulary; knowledge about nature of emotion; emotional recognition); (f) Emotional responses while reading (immersion experiences, flow, peak experiences, emotional processes and states while reading).

#### 3.3.1 Reading and Social-Relational and Interpersonal Skills

The relationship between reading and social-relational and interpersonal skills is investigated by 13 studies. Among these, seven focus on childhood and six on the school-age period (four are set in primary schools, one in a middle school, one in a high school). All articles underline a positive association between reading and the development of interpersonal skills since the early months of life and up to the end of high school. Focusing on early childhood, two relevant studies (Baker, 2013; Baker & Rimm-Kaufman, 2014) and one longitudinal research (Ferretti & Bub, 2017) reveal a significant and positive association between home literacy activities (e.g. shared book reading) provided by parents and children’s development of socio-emotional skills (such as prosocial behaviors, engagement and focused involvement while interacting with others) and interpersonal skills (forming and maintaining friendships, comforting or helping other children, etc.). Still regarding the domestic environment, four studies analyze parents-child interactions during shared book readings and found that kids are exposed to a greater and more variable emotional and mental states talk while reading picture books with their parents than when playing with them (Drummond et al., 2014). Moreover, the more the parents and the child discuss about social-emotional issues, the more the child will tend to show prosocial and socially appropriate behaviors (Aram et al., 2017; Drummond et al., 2014; Schapira & Aram, 2019), as shown also in the school-age period (Curtis, Zhou, & Tao, 2020). The same association between reading and interpersonal skills development is reported in the nursery (Betawi, 2015). As far as the primary school is concerned, reading interventions are proven to foster prosocial behaviors and attitudes (Jones, Brown, & Lawrence Aber, 2011), compliant and focused class behaviors (Brokamp et al., 2019), social awareness and metacognition (Venegas, 2019). With regards to middle school and high school, reading interventions promoted social-relational skills (Tijms, Stoop, & Pollock, 2018) and sociability (Abdolrezaipoor & Tavakoli, 2012).

Table 1. Emotional constructs in Childhood

Study	Social - interpersonal skills <sup>[1]</sup>	Emotional - behavioral problems <sup>[2]</sup>	Emotional and behavioral adaptive competencies <sup>[3]</sup>	Understand - sympathize with others' mind <sup>[4]</sup>	Emotional Knowledge <sup>[5]</sup>	Emotional responses <sup>[6]</sup>
Drummond et al., 2014	x					
Betawi, 2015	x	x	x			
Karniol, 2012				x		
Laforge et al., 2018					x	
Grazzani & Ornaghi, 2011				x	x	
Baker, 2013	x	x				
Schapira & Aram, 2019	x			x	x	
Ferretti & Bub, 2017	x	x				
Baker & Rimm-Kaufman, 2014	x	x	x			
Aram et al., 2017	x					
Beazidou, et. al., 2013					x	
Riquelme & Montero, 2016			x	x	x	
Riquelme et al., 2013				x	x	

Description: [1] prosocial behavior, cooperation, assertiveness, adaptability, social awareness; [2] anxiety and depression, emotional maladjustment, social problems, conduct problems, aggressive behavior, ADHD symptoms; [3] self-control, emotional competence (expression and regulation), emotional stability, impulse-control, self-esteem; [4] empathy, theory of mind, understanding of emotions, social imagination, social understanding, sympathy, perspective-taking; [5] emotional vocabulary; knowledge about nature of emotion; emotional recognition; [6] immersion experiences, flow, peak experiences, emotional processes and states while reading.

### 3.3.2 Reading and Emotional and Behavioral Problems

The association between reading and the presence of emotional and behavioral problems is investigated by 8 articles: 4 studies are set in childhood, while the other four regard the school-age period (two in primary school, one in middle school, one in high school). As far as childhood is concerned, two studies with large samples (Baker, 2013; Baker & Rimm-Kaufman, 2014) and one longitudinal research (Ferretti & Bub, 2017) underline that home literacy interactions (e.g. shared book reading) and the presence of a large number of books at home have a negative and significant correlation with children's externalizing behaviors, conduct problems, negativity, and hyperactivity and impulsivity while interacting with others. Similarly, this result appears also in a nursery after a reading intervention (Betawi, 2015). As regards to school-age, poor readers in primary school result to feel more anger, sadness, and anxiety and perceive to be more unpopular than stronger readers (Morgan et al., 2012), while having reading difficulties at middle school predicts anxiety and depression, social problems, and aggressive and delinquent behaviors (Undheim et al., 2011). On the other hand, a two year reading program in schools reduces hostile attribution, depressive and ADHD symptoms and, after two years, aggressive behavior (Jones et al., 2011). Another five weeks reading intervention on high school hyperactive students brought a significant decrease in hyperactivity. However, this gain was not maintained after two weeks by the end of the treatment (Pang & Zhang, 2011).



### 3.3.3 Reading and Emotional and Behavioral Adaptive Competencies

Ten articles examine the relation between reading and emotional and behavioral competencies. Among them, three are focused on childhood and seven on the school-age period (five are set in primary school, one in middle school, one in high school). These studies underline how reading predicts a better emotional well-being and stability from the first months of life to the end of high school. The childhood studies show that domestic literacy activities foster self-control (controlling temper, accepting peer ideas for group activities, etc.) (Baker & Rimm-Kaufman, 2014). Reading interventions appear to bring to similar results in nursery (Betawi, 2015), while mediated reading programs are associated with better emotional regulation in the transition from kindergarten to primary school (Riquelme & Montero, 2013, 2016). Still regarding primary school, reading classes appear to improve self-confidence (Casserly, 2011; Venegas, 2019) and emotional stability (Brokamp et al., 2019); literacy interventions support emotional regulation (Jones et al., 2011); bibliotherapeutic book clubs foster emotional expression and self-confidence in middle school (Tijms et al., 2018), while one reading training with books with high emotional contents leads to better emotional intelligence in high school (Abdolrezapour & Tavakoli, 2012).

Table 2. Emotional constructs in School-Age

Study	Social - interpersonal skills <sup>[1]</sup>	Emotional - behavioral problems <sup>[2]</sup>	Emotional and behavioral adaptive competencies <sup>[3]</sup>	Understand - sympathize with others' mind <sup>[4]</sup>	Emotional Knowledge <sup>[5]</sup>	Emotional responses <sup>[6]</sup>
Riquelme & Montero, 2013			x	x	x	
Casserly, 2011			x			
Angantyr et al., 2016				x		
Ornaghi et al., 2014				x	x	
Curtis et al., 2020	x			x		
Lysaker & Tonge, 2013				x	x	
Jones et al., 2011	x	x	x			
Brokamp et al., 2019	x		x			
Gordon, 2017				x	x	
Morgan et al., 2012		x				
Beck et.al, 2012				x	x	
Kumschick et al., 2014				x	x	
Venegas, 2019	x		x	x		
Tomé-Fernández et al., 2019				x		
Stutler, 2011				x		x
Undheim et al., 2011		x				
Chisholm et al., 2017				x		
Tijms et al., 2018	x		x			
Dylman et al., 2020					x	
Yussof et al., 2013						x
Boatright & Allman, 2018				x		
Pang & Zhang, 2011		x				
Abdolrezapour & Tavakoli, 2012	x		x	x		
Gerrig et al., 2016				x		x

Description: [1] prosocial behavior, cooperation, assertiveness, adaptability, social awareness; [2] anxiety and depression, emotional maladjustment, social problems, conduct problems, aggressive behavior, ADHD symptoms; [3] self-control, emotional competence (expression and regulation), emotional stability, impulse-control, self-esteem; [4] empathy, theory of mind, understanding of emotions, social imagination, social understanding, sympathy,

perspective-taking; [5] emotional vocabulary; knowledge about nature of emotion; emotional recognition; [6] immersion experiences, flow, peak experiences, emotional processes and states while reading.

### 3.3.4 Reading and the Ability to Understand and Sympathize With Others' Mind

With 30 studies focused on it, the ability to understand and sympathize with others' mind is the most represented emotional construct in our review: five articles are focused on childhood, 15 on the school-age period (ten are set in primary school, two in middle school, three in high school), and 10 on adulthood. One of these studies covers the highest age period of our review: 17-73 years old (Koopman, 2016). The childhood studies reveal that story-book and reading training evoke theory of mind and empathic understanding in self, others, and even animals (Grazzani & Ornaghi, 2011; Karniol, 2012). Socio-emotional utterances generated during shared-book reading interactions are associated as well with empathy growth both in childhood (Schapira & Aram, 2019) and in school-age period (Curtis et al., 2020). Mediated reading fosters empathy even in the transition from preschool to school and in primary school (Riquelme & Montero, 2013, 2016; Riquelme et al., 2013). Children's literacy assessed in primary school relates to the ability to understand others' emotions (Kumschick et al., 2014). Reading programs based on socio-emotional texts seem to reduce sex differences in empathy expression (Angantyr et al., 2016), while literature circles, reading interventions and reading classes based on multicultural literature were found to increase empathy and theory of mind in primary school (Beck et al., 2012; Gordon, 2017; Kumschick et al., 2014; Lysaker & Tonge, 2013; Tomé-Fernández et al., 2019; Venegas, 2019), with stable effects even after six months by the end of the intervention (Ornaghi, Brockmeier, & Grazzani, 2014). Similar results were found in middle school (Stutler, 2011), while the use of graphic novels elicited empathy and historical empathy (Chisholm et al., 2017). As about high school, literature circles (Boatright & Allman, 2018) and reading training with social-emotional content books (Abdolrezapour & Tavakoli, 2011) promote empathy. Laboratory studies with adolescents and university students underline that engaging (Gerrig et al., 2016) and foregrounding texts (Koopman, 2016), as well as books with negative contents (Altmann et al., 2012), can foster empathy. As about adulthood, a study with university students underlines that women read more than men and show a stronger association between reading appreciation and empathy; instead, reading non-fiction (such as university textbooks) does not associate with empathic scorings (McCreary & Marchant, 2017). Similarly, textual difficulty is negatively associated with empathy (Junker & Jacquemin, 2017). On the other side, fiction reading significantly relates to theory of mind abilities (Tabullo et al., 2018). A series of qualitative studies on university students and pre-service teachers reveals that reading classes and bibliotherapeutic sessions promote empathic reflections and connections (Chamberlain, 2019; Hoggan & Cranton, 2015), empathic understandings of issues such as suicide and bullying (Pytash, 2013), and perspective taking and reflections about racism, reducing prejudice and stereotypes (Glenn, 2012; Slay & Morton, 2020). Only two studies do not find a significant increase in empathy over the course, respectively, of a 15 weeks reading workshop (Junker & Jacquemin, 2017) and a four week class reading intervention (Gordon, 2017).

### 3.3.5 Reading and Emotional Knowledge

The association between reading and emotional knowledge is examined by 13 studies: six refer to childhood and seven to school-age (six are set in primary school, one covers the last year of middle school and the high school). These studies investigate the emotional knowledge: with this term we refer to the knowledge about the emotions' nature, the emotional vocabulary and ability to recognize the emotional facial expressions and to label them with the right term. Except for two studies (Gordon, 2017; Laforge et al., 2018), all of these articles reveal that reading has a positive association with emotional knowledge: the more one reads, the more he/she will become an 'expert' of emotions. This result is extended to all the ages considered in these studies. More specifically, reading practice has a significant impact on the recognition of emotions and this evidence is found both in preschool (Riquelme & Montero, 2016; Riquelme et al., 2013) and primary school (Beck et al., 2012; Lysaker & Tonge, 2013; Riquelme & Montero, 2013). The research group of Riquelme and Montero (2013, 2016) and Riquelme and colleagues (2013) used the same tools to assess this emotional component. The same effect is also found in the emotions comprehension in preschool (Grazzani & Ornaghi, 2011) and primary school (Beck et al., 2012; Kumschick et al., 2014; Lysaker & Tonge, 2013), with a stable effect in follow-up (Ornaghi et al., 2014). Emotional vocabulary is also increasing as a result of reading practice (Dylman et al., 2020; Kumschick et al., 2014; Ornaghi et al., 2014). Parents' socio-emotional discourses evaluated in conversations during and after reading in the family have an impact on children's understanding of the causes of emotions (Schapira & Aram, 2019). The study by Beazidou and colleagues (2013) highlights the techniques used by teachers to foster emotional knowledge during reading in preschool: they use movements and voice as mediators of emotional understanding and expression, urge pupils to find the cause of an emotion, compare the feelings of different characters and lead to imagine what will happen next.

Table 3. Emotional constructs in Adulthood

Study	Social - interpersonal skills <sup>[1]</sup>	Emotional - behavioral problems <sup>[2]</sup>	Emotional and behavioral adaptive competencies <sup>[3]</sup>	Understand - sympathize with others' mind <sup>[4]</sup>	Emotional Knowledge <sup>[5]</sup>	Emotional responses <sup>[6]</sup>
McCreary & Marchant, 2017				x		
Pytash, 2013				x		
Hoggan & Cranton, 2015				x		
Hartung et al., 2016						x
Hsu et al., 2014						x
Iacozza et al., 2017						x
Altmann et al., 2012				x		x
Tabullo et al., 2018				x		
Koopman, 2015				x		x
Junker & Jacquemin, 2017				x		
Slay & Morton, 2020				x		
Glenn, 2012				x		
Chamberlain, 2018				x		

Description: [1] prosocial behavior, cooperation, assertiveness, adaptability, social awareness; [2] anxiety and depression, emotional maladjustment, social problems, conduct problems, aggressive behavior, ADHD symptoms; [3] self-control, emotional competence (expression and regulation), emotional stability, impulse-control, self-esteem; [4] empathy, theory of mind, understanding of emotions, social imagination, social understanding, sympathy, perspective-taking; [5] emotional vocabulary; knowledge about nature of emotion; emotional recognition; [6] immersion experiences, flow, peak experiences, emotional processes and states while reading.

### 3.3.6 Reading and Emotional Responses While Reading

The emotional responses elicited by reading is examined in 8 articles: 3 refer to school-age (1 is related to middle school and 2 to high school) and 5 to adulthood. Some of these articles (Stutler, 2011; Yussof, Jamian, Hamzah, & Roslan, 2013) underline that reading programs can evoke states of flow (a state of enjoyment in which sensations are heightened and thoughts and feelings fade, with a loss of time, place and self; Csikszentmihalyi, 1990), peak experiences (states of pure joy associated with moments of great truth or beauty, with a lack of awareness about time, space and self) and emotional responses. Foregrounding and engaging books, with first person pronouns and fear-inducing passages generate amusement, emotional responses and immersion experiences (Gerrig et al., 2016; Hartung, Burke, Hagoort, & Willems, 2016; Hsu, Conrad, & Jacobs, 2014; Koopman, 2016). Native language books (Iacozza et al., 2017) elicit stronger emotional reactions than foreign language books. Texts with negative contents evoke stronger emotional reactions and neural responses in comparison to neutral texts (Altmann et al., 2012; Hsu et al., 2014).

## 4. Discussion

In line with educational and psychological literature (Adrián et al., 2005, Mar et al., 2006) most of our findings underline an association between reading and socio-emotional skills. Indeed, only three studies of our sample (Gordon, 2017; Junker & Jacquemin, 2017; Laforge et al., 2018) do not highlight a significant association between reading and students' emotional scoring. These studies are conducted in naturalistic settings (daycare centers, a primary school and a university) with small samples and promote short term interventions (respectively, 3, 15 and 4 weeks) that foster empathic responses and emotional comprehension, but do not produce significant enhancements over time. Moreover, one of these studies does not find an effect over emotional vocabulary. However, these results may be due, as suggested

by the authors, to the limited amount of time (that, unlike laboratory studies, may not have been enough in naturalistic settings) and to the use of qualitative and holistic measures (instead of the tools used in lab settings). Indeed, children's development of emotion comprehension may require longer time, as suggested by Pons and Harris (2000).

Besides these exceptions, the articles included in our review show a positive effect of reading on emotional dimensions all across several developmental stages. In fact, they cover a life span from the early months of life to adulthood, involving samples composed by infants, as well as school-age participants and adults. In contrast to the findings of Kozak and Recchia (2019), most of our articles (especially those with an educational perspective) focus on the school-age period, adding information on this still little studied evolutionary phase. Interestingly, adulthood samples are mostly composed by university students, while we found no study specifically focused on elderly or middle-aged samples. Thus, our review sheds light on a gap in the scientific literature and highlights the need of research investigating the relationship between reading and emotional dimensions even in other life stages with older participants.

Our review shows a beneficial effect related to books starting from childhood. The more a child is exposed to shared book readings, the more he/she will develop interpersonal and empathic skills and theory of mind abilities and will count on better emotional well-being and competence. Even more important, the more a child is provided with reading experiences, the less he/she will be likely to develop behavioral problems (e.g. externalizing behaviors, conduct problems, negativity towards parents). These associations are clear both in educational and family settings and are supported, in particular, by three studies (derived from the USA survey: Early Childhood Longitudinal Study, Birth and Kindergarten Cohort) that were based on very numerous samples and on quantitative and/or longitudinal research design (Baker, 2013; Baker & Rimm-Kaufman, 2014; Ferretti & Bub, 2017).

A possible way to portray these findings is suggested by a sample of 4 articles that, in both childhood and school-age participants, investigate the interactive processes elicited by shared book readings. Indeed, these studies show that reading interactions evoke more emotional utterances and mental states talk by both parents and children in comparison to other playing activities. Among these studies the longitudinal correlational research conducted by Curtis and colleagues (2020) must be highlighted, since its methodological reliability. Results show that parents' emotional talk during shared book reading was related to children's higher effortful control, that, in turn, was positively associated with children's higher sympathy and more socially appropriate behaviors. These findings are in line with the literature (Howe, Rinaldi, & Recchia, 2010), that demonstrates how this kind of interaction can foster children's better socio-emotional skills.

Similar results have been found in the school-age period and in adulthood. Scholastic settings are mostly taken into consideration and both quantitative and qualitative studies reveal that reading interventions (class readings, bibliotherapeutic interventions, reading aloud or silently, reading programs, literature circles, book clubs) and good reading habits support the development of relational abilities, emotional competence and empathic skills. Moreover, in both childhood and school-age period, there is evidence that these activities and being a strong reader enhance emotional knowledge, meaning the competence in recognizing and correctly labeling emotions and the awareness about their nature and causes. In particular two quantitative controlled studies (Grazzani & Ornaghi, 2011; Ornaghi et al., 2014) show that a 2 month reading training, based on emotional contents and followed by activities focused on emotional knowledge, promotes both empathy and emotion comprehension, with a stable effect over 6 months (Ornaghi et al., 2014).

One of a teachers' most implemented strategies is the use of multicultural literature, counter-narratives, or books with high socio-emotional contents to enhance empathy and reduce prejudice and intercultural conflicts. Even the use of historical graphic novels (Chisholm et al., 2017) has been effective.

Importantly, the environment is shown to have an influence over the association between reading experiences and emotional development, since educators and teachers can play an important role in fostering this positive relation. Three methodologically accurate studies (Riquelme & Montero, 2013, 2016; Riquelme et al., 2013), conducted with a quantitative research design in naturalistic settings (in the transition from kindergarten to primary school), implemented a training based on mediated reading. Results, supported by comparisons with control groups, show that this practice fosters interactions between the reader and the group and promotes the development of theory of mind. Other studies suggest that also other kinds of interactions, such as group discussions among peers with or without an adult facilitator (with secondary school and university students), support the building of connections between the text and the readers' lives and foster reflection and awareness about one's emotions and empathic feelings. Moreover, teachers, through a supportive attitude and by providing good reading models, can improve students' school behaviors and emotional well-being and, indirectly, support their literacy skills (Brokamp et al., 2019).

This positive influence of reading over behavioral and emotional problems is underlined also by two articles (Morgan et

al., 2012; Undheim et al., 2011) (one in primary and one in middle school), that show that being a poor reader and having reading difficulties correlate with the presence of anxiety, depression, social problems and aggressive behaviors. However, reading interventions have proven to be effective in reducing these manifestations. This result may depend on the finding that good readers also rely on better emotional regulation and expression that, in turn, may improve impulse control and foster psychological protective factors such as social success and greater self-esteem. Since a five week intervention addressing hyperactivity in high school students showed only a short-term efficacy (Pang & Zhang, 2011), long-lasting reading interventions should be implemented in order to obtain more stable behavioral benefits. Indeed, a reading intervention performed by Jones and colleagues (2011) showed a decrease in hostile attributions after one year, and a steeper decline of ADHD and depression symptoms over two years; however improvements in aggressive interpersonal negotiation strategies and social competencies were found only after two years. In line with the developmental cascades theory (Masten & Cicchetti, 2010), this may depend on the fact that interventions have to change, firstly, social cognitions and social-emotional dimensions in order to achieve subsequent changes in behaviors. As suggested by this theory, these psychological and behavioral gains would lead to long-term effects, thwarting the onset of later delinquent behaviors and providing universal benefits in academic skills (Pang & Zang, 2011; Jones et al., 2011) and in other developmental domains (delayed onset of substance use and reduced academic disengagement/failure) (Eddy et al., 2003; Lochman & Wells, 2004).

This association between reading and emotional dimensions may be explained by the emotional responses elicited by reading. Reading fiction and narrative stories (Altmann et al., 2012; Hsu et al., 2014) activates neural areas related to theory of mind cognitive (dorsomedial prefrontal cortex, bilateral temporal poles and left posterior superior temporal sulcus) and emotional dimensions (left inferior frontal gyrus, mid-cingulate cortex). These articles analyze the connections between reading and emotions from a neuroscientific point of view, emphasizing the role of reading in activating neural processes linked to empathy. Other studies in lab settings underline that texts with socio-emotional contents, connotative language and with engaging features evoke strong emotional responses. In line with the literature (Oatley, 1999), first person narratives also promote a deeper immersion experience and emotional reactions.

Several studies also suggest that it is not the reading per se that promotes empathy and emotional growth: textual characteristics are important (Junker & Jacquemin, 2017). As shown by previous research (Batini et al., 2018; Kidd & Castano, 2013, 2017), fiction, unlike non-fiction texts, have resulted to foster empathy and theory of mind (Hoggan & Cranton, 2015; McCreary & Marchant, 2017; Tabullo et al., 2018). Reading fiction may elicit deep emotional reactions and empathic connections, promote awareness and psychological growth and foster transformative learning and critical thinking about the self and the world.

Another important finding is that the positive relationship between reading and emotional development is valid regardless of gender. This result is in contrast with previous studies that found a stronger association in females (Mar et al., 2009). In fact, only two studies identify a clear and significant gender difference in empathic scoring after reading: one in favour of male participants (Tabullo et al., 2018), and one in favour of females (McCreary & Marchant, 2017). Interestingly, one of our studies suggests that reading may reduce sexual difference in empathic manifestations by improving males' emotional skills (Angantyr et al., 2016).

In conclusion, our review highlights a positive association between reading and socio-emotional dimensions across several developmental stages and regardless of gender and setting, supporting the idea of a lifelong reading. Moreover, this association is underlined through different assessment tools in both qualitative (e.g. Tomé-Fernández et al., 2019) and quantitative studies (e.g. Riquelme & Montero, 2013), as well as in studies without (e.g. Baker, 2013) or with the promotion of an intervention, such as training (e.g. Ornaghi et al., 2014), workshops (e.g. Slay & Morton, 2020) or reading sessions (e.g. Curtis et al., 2020).

However, caution is necessary in interpreting these results, since most of our findings show bidirectional associations, not proving causal effects, meaning that more studies are needed to clarify this relationship. Despite this, the positive effects that reading interventions seem to have in reducing psychological symptomatology and enhancing empathy, as well as their activation of brain areas related to theory of mind, supports the implementation of reading programs in family and educational settings at every evolutionary stage in order to achieve better socio-emotional skills.

#### *4.1 Limitations*

Although this review offers a deeper perspective with regard to the analysis of the association between reading and emotions, we acknowledge that it is possible to identify two main categories of limitations. The first concerns the inclusion criteria. Generally speaking, we maintained a global focus of research and this choice could be seen as a strength, because it led us to collect a huge set of articles on which we developed some interesting comparisons. On the other hand, we had to deal with comparing studies with different focuses. For example, we pointed out that all empirical studies were included (see the second criterion), independently from research designs. Consequently, all studies have a

different setting (e.g. home environments, labs, schools, universities or other services with an explicit educational purpose) and we did not make a discrimination in this way (see the fifth criterion). Still, studies investigated the reading component in a broad sense (see the sixth criterion). In some cases, studies (e.g. Aram et al., 2016; Drummond et al., 2014; Lysaker & Tonge, 2013) focused on a shared reading modality; in others (e.g. Boatright & Allman, 2018; Chisholm et al., 2017; LaForge et al., 2018) they concerned an individual reading modality; in others, reading habits and general language skills were assessed and therefore it was not implemented any intervention (e.g. Baker, 2013; Baker & Rimm-Kaufman, 2014). Thus, it was not possible to make a unitary comparison and grasp specific mechanisms of reading that were more associated with the emotional constructs investigated. In any case, this open-minded approach led us to collect some noteworthy empirical evidence, even for future research and educational implications.

The second type of limitations relates to the data collection process. Since we reported the complexity to consider a shared, unique definition of socio-emotional competence, we used several keywords (see Search strategy) in order to account for the complexity and multidimensionality of the emotional constructs and prevent studies with different constructs – but inherent to our research focus – from being excluded. As a matter of fact, we analyzed a huge number of articles that focused on the same emotional constructs, but also on socio-emotional competencies with different or more hues of meaning. This, although has provided a great deal of data, has often led us to compare different constructs, or similar constructs but defined in different terms in individual studies.

## 5. Conclusion and Future Directions

We are aware that the analytical work carried out can not be considered exhaustive. Despite the limitations of this review and the complexity inherent in the variables of reading and emotions that are the subject of this research, we consider the path of this analysis and the results found very meaningful to better understand the association between reading and emotions. Our broad investigation may inspire more specific foci of research: for example, the categorization we have carried out on the broad construct of socio-emotional competence, subdividing the studies into six main areas, could provide a starting point for future reviews focusing on more particular aspects; the same mechanism could also be carried out for the reading components, developing surveys aimed at evaluating interventions based on a specific type of reading, such as mediated reading. Moreover, as shown, the effects of interactive reading (Lysaker & Tonge, 2013; Riquelme & Montero, 2016) are proven to improve socio-emotional competence; so it may be interesting to argue about the implications that the continuative implementation of this practice in the schools may have over long-term periods. Finally, as discussed before, the impact of reading on adult and elderly populations emotions may be a particular matter of interest when formulating new research may be a particular matter of interest, since we have collected only one study which takes into account older participants (Koopman, 2015), even though we did not set a restriction about this criterion.

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## Appendix A

Table 4. Descriptive Results of Childhood

Authors, Title, Country	Design, Intervention area	Sample	Evaluation tools	Intervention	Outcomes
Drummond et al., 2014  Here, there and everywhere - Emotion and mental state talk in different social contexts predicts empathic helping in toddlers  USA	Quantitative Study  Emotional language and prosociality	Nursery  38 parent-child dyads Age: 18-30 months	Video recordings; observation grids; MacArthur Communicative Development Inventory (Fenson et al., 2000)	Reading and play sessions	Parents used and explained emotions and mental states more when reading the register than when playing ( $p < 0.001$ ). Parents' utterances about emotions and mental states were positively correlated with children's empathic help ( $p < 0.01$ ). Children who provided help more quickly in the empathic help situation had parents who generated language focused on emotions or mental states more often while reading books together ( $p < 0.05$ ), but labeled emotions or mental states more often while playing with toys together ( $p < 0.05$ ).
Betawi, 2015  What effect does story time have on toddlers' social and emotional skills  Jordan	Quantitative Study  Socio-emotional development	Nursery  10 toddlers Age: 24-36 months 40% female	Questionnaire, compiled by the educator, created from the Social Skills Rating Scale (Gresham & Elliott, 2008).	Reading training  Daily reading (5-8 minutes) for 3 weeks	Positive and significant increase ( $p < .001$ ) in children's socio-emotional competences between pre-test and post-test. Dealy story reading in kindergartens has a significant impact on young children's socio-emotional development.
Karniol, 2012  Storybook-induced arousal and preschoolers' empathic understanding of negative affect in self, others, and animals in stories  Israel	Quantitative Study  Empathy levels with oneself and others, including animals	Preschool  60 children (15 children in 4 different experimental conditions) Age: 3-4.9	"Projective" test with carbon paper; Structured interview created ad-hoc.	Reading aloud session	All children showed more excitement after hearing the story. Those who had empathic understanding for the protagonist's situation showed significantly higher levels of excitement than those who had not such understanding. This excitement depends on the understanding of the protagonist's psychological situation; participants with empathic understanding were also more likely to understand the negative affect associated with cartoons in which other children were the actors. They also understood better that they too, in the same situation, would have experienced a negative affect. This understanding brought to predictions of negative affect for other children and themselves in general contexts.

Laforge et al., 2018	Quantitative Study	Preschool 18 children	Illustrated books created ad-hoc; Test of Emotion Comprehension (TEC) (Pons & Harris, 2000).	Reading training 7 times in three weeks	There was a significant difference in the experimental group scores ( $p=.01$ ) related to emotions comprehension; more precisely, these results show a higher score in the post-test than in the pre-test for the experimental group.
Contributing to children's early comprehension of emotions: A picture book approach	Reading and emotions comprehension	Experimental: 9 children; M: 41.88 months; 77.7% female			
France		Control: 9 children; M: 40 months; 77.7% female			
Grazzani & Ornaghi, 2011	Quantitative Study	Preschool 100 children	Metacognitive Verb Comprehension (MVT) (Pelletier & Astington, 1998); Test of Emotion Comprehension (TEC) Pons & Harris, 2000).	Reading training 2 months	Significant effect on children's performance in both metacognition and emotions comprehension, with an impact on age. There was also an effect of time on metacognition ( $p=0.001$ ) and an improvement in children aged 4 and 5 years in comparison to children aged 3 years ( $p<0.01$ ). When emotions were concerned, time had a significant effect ( $p=0.001$ ); an improvement was seen in children aged 4 and 5 in comparison to children aged 3 ( $p<0.01$ ).
Emotional state talk and emotion understanding: A training study with preschool children	Language of emotional theory of mind	Experimental: 50 children; M: 52.55 months			
Italy		Control: 50 children; M: 51.52 months			
Baker, 2013	Quantitative Longitudinal Study	Preschool 5190 children M: 52 months 67.1% female	Three Bags task - modified version (Nord et al., 2004); Parent interviews; resident fathers questionnaire.	No intervention	Involving children in literacy activities by mothers and fathers promotes greater cognitive and socio-emotional development in children. Mothers and fathers who more often involved their children in literacy activities at 24 months and provided them more books had children with greater socio-emotional development. This result emerged in the domains of involvement ( $p<0.01$ ), sustained attention ( $p<0.01$ ) and expression of negative behavior (that decreased) ( $p<0.01$ ).
Fathers' and mothers' home literacy involvement and children's cognitive and social emotional development: Implications for family literacy programs	Literacy and socio-emotional development				
USA					
Schapira & Aram, 2019	Quantitative Study	Preschool 50 kindergarten children M: 55.64 months 48% female	Semi-structured naturalistic interview during a game; Interview after watching parts of a film, scaled answers; MacArthur Story Stem Battery (MSSB) (Oppenheim et al., 1997).	Reading sessions 2 weeks	Parents' socio-emotional discourses significantly explained all the evaluated socio-emotional outcomes ( $p<0.05$ ; $p<0.01$ ). The parents' general statements explained empathy and social coherence ( $p<0.05$ ). Children's socio-emotional and general statements during SBR significantly explained all socio-emotional outcomes ( $p<0.05$ ; $p<0.01$ ), except for the causes of emotions ( $p=0.06$ ). Language level and children's age explained children's empathy ( $r=.29$ , $p=.05$ ) and the SES explained children's social coherence.
Shared book reading at home and preschoolers' socioemotional competence	Reading and socio-emotional competence				
Israel					



<p>Ferretti &amp; Bub, 2017</p> <p>Family routines and school readiness during the transition to kindergarten</p> <p>USA</p>	<p>Quantitative Longitudinal study</p> <p>Literacy and socio-emotional development</p>	<p>Preschool</p> <p>3250 children M: 5.67 years old 50% female</p>	<p>Teacher-report based on the Preschool and Kindergarten Behavior Scales (Merrell, 2003) and the Social Skills Rating System (Gresham &amp; Elliott, 1990); Computer-assisted personal interviews, questionnaires.</p>	<p>No intervention</p>	<p>Children exposed to more preschool routines (bedtime routine, reading routine, telling stories, singing songs, dinner as a family, and dinner at a regular time) later exhibited greater gains in socio-emotional skills in comparison to children exposed to fewer routines. All the six routines were individually and significantly associated with the outcomes.</p>
<p>Baker &amp; Rimm-Kaufman, 2014</p> <p>How homes influence schools: Early parenting predicts African American children's classroom social-emotional functioning</p> <p>USA</p>	<p>Quantitative Study</p> <p>Literacy and socio-emotional development</p>	<p>Preschool</p> <p>2467 children M: 5.6 years old</p>	<p>Social Skills Rating Scale (Gresham &amp; Elliott, 1990); Home Observation for Measurement of the Environment scale (Caldwell et al., 1984).</p>	<p>No intervention</p>	<p>Maternal warmth was positively correlated (<math>p &lt; .05</math>) with mothers' learning stimulation at home (shared book reading, visits to the library, singing songs, storytelling and providing educational opportunities). Mothers' learning stimulation predicted a better approach to learning (<math>p &lt; .001</math>), better self-control and interpersonal skills (<math>p &lt; .005</math>; <math>p &lt; .001</math>), and less externalizing behaviors (<math>p &lt; .005</math>) in children.</p>
<p>Aram et al., 2017</p> <p>Shared book reading interactions within families from low socioeconomic backgrounds and children's social understanding and prosocial behavior</p> <p>Israel</p>	<p>Quantitative Study</p> <p>Socio-emotional development</p>	<p>Preschool</p> <p>61 kindergarten children with their mothers M: 5.8 years old 50% female</p>	<p>Video recordings of mother-child interactions; A measure based on drawings representing social norms or moral violations (Smetana, 1981); Observations of a sharing game with a friend (Levin &amp; Bekerman Greenberg, 1980).</p>	<p>Reading sessions</p> <p>Two weekly sessions for a fortnight (30-40 minutes)</p>	<p>After reading, decontextualized references prevailed both in mothers (<math>p &lt; .001</math>) and in children (<math>p &lt; .05</math>). These references are associated in literature to better socio-emotional development. References by mothers and children to the book's socio-emotional contents were associated with greater socio-emotional understanding (<math>p &lt; .05</math>) and prosocial behavior (<math>p &lt; .05</math>) in children. When mothers and children used more socio-emotional contents, children showed greater social understanding (<math>p &lt; .05</math>) and more prosocial behavior (<math>p &lt; .05</math>) than children belonging to dyads in which less socio-emotional contents were used.</p>
<p>Beazidou et. al., 2013</p> <p>Promoting emotional knowledge: Strategies that Greek preschool teachers employ during book reading</p> <p>Greece</p>	<p>Qualitative Study</p> <p>Reading and emotional knowledge</p>	<p>Preschool</p> <p>224 kindergarten children and 12 teachers</p>	<p>Classroom observation; Audio recordings at reading time; Interviews.</p>	<p>Reading training</p> <p>25 minutes for reading session</p>	<p>Two main strategies: simple dialogues and active participation with more complex conversations. Teachers tried to build a new emotive vocabulary; movements and voice were used as educational techniques to mediate emotional understanding and expression; they asked to find the cause of an emotion, to compare the different characters' feelings and to imagine what will happen next. Another strategy was to focus on children's personal emotions while reading.</p>

Riquelme & Montero, 2016	Quantitative Study	From preschool to second grade	Diagnostic Analysis of Nonverbal Accuracy-2 (DANVA-2); (Nowicki, 2007); Griffith Empathy Measure-Parent Report (GEM-PR); (Hunter & Bech, 2003); Emotion Regulation Checklist (ERC); (Shields & Cicchetti, 1997).	Reading training	Emotional skills in the mediated reading group increased compared to the traditional reading group.
Long-term effects of a mediated reading programme on the development of emotional competences	Reading and emotional competence (recognition, regulation and empathy)	50 children 55.6-96.83 months divided into experimental group (mediated reading) and control group (traditional reading); characteristic s not specified		8 months (two reading sessions per week each lasting 25-40 minutes)	Recognition of emotions: significant effect in the interaction between "Treatment" and "Evaluation" ( $p < .01$ ) and in the interaction between "Degree" and "Treatment" ( $p < .05$ ). Empathy: significant, although marginal, fourfold interaction between the factors Evaluation, Treatment, Degree and Sex ( $p = .07$ ). Emotional regulation: it shows a significant effect on the interaction "Treatment" and "Evaluation" ( $p < .01$ ), as well as in the interaction between the factors "Degree" and "Treatment" ( $p < .01$ ). Higher results were found in the childhood group. Improvements were also found in the control group, although lower.
Chile					
Riquelme et al., 2013	Quantitative Study	From preschool to primary school	Diagnostic Analysis of Nonverbal Accuracy (DANVA-2) - abbreviated version (Nowicki, 2007; Nowicki & Carton, 1993); Griffith's empathy (GEM-PR) (Dadds et al., 2008).	Reading training	The intervention had a significant impact on children in the mediated reading group, where facial recognition skills of emotions (Childhood group: $p < .01$ ; Primary group: $p < .01$ ) and empathy (Childhood group: $p < .01$ ; Primary group: $p < .01$ ) are increased in comparison to the traditional reading group.
Reconocimiento facial de emociones y desarrollo de la empatía mediante la lectura mediada de literatura infantil	Mediated reading and emotional competence (Facial recognition of emotion and Empathy)	101 children Experimental: 24 kindergarten children; M: 65.75 months; 66,66% female 30 primary students; M: 75.61 months; 40% female Control: 18 kindergarten children; M: 66.19 months; 50% female 29 primary students; M: 75.79 months; 55.1% female		5 months (two sessions on week of 25-40 minutes)	
Chile					

## Appendix B

Table 5. Descriptive Results in School-age

Authors, Title, Country	Design, Intervention area	Sample	Evaluation tools	Intervention	Outcomes
Riquelme & Montero, 2013  Improving emotional competence through mediated reading: Short term effects of a children's literature program  Spain, Chile	Quantitative Study  Mediated reading and emotional competence	Primary School (first grade)  92 students M: 6.7 years old  Experimental: 44 students; 43.18% female  Control: 30 students; 36.66% female; 18 students; 38.88% female	Diagnostic Analysis of Non Verbal Accuracy-2 (DANVA-2) (Nowicki, 2007); Emotional Regulation Checklist (ER) (Shields & Cicchetti, 1997); Griffith Empathy Measure (GEM-PR) (Hunter & Bech, 2003).	Reading training  4 months (two weekly meetings)	The mediated reading program had a significant effect on all the variables indicated with respect to the control groups: recognition of emotions ( $p < .01$ ), empathy ( $p < .01$ ), emotional lability ( $p < .01$ ).
Casserly, 2011  Children's experiences of reading classes and reading schools in Ireland  Ireland	Longitudinal Qualitative Study  Reading Experience and socio-emotional factors	Primary school  20 students Age: 6-7	Semi-structured interview created ad-hoc.	Special Reading Program	Children were aware of their inadequacies, particularly when they read in front of their peers in class. Almost half of the children felt that their peers were aware of their difficulties, but were empathetic towards them. In some cases, children felt embarrassed, especially when others laughed that they were losing their mark in reading. They also reported that they had improved their self-help strategies and referred to their determination to solve problems.
Angantyr et al., 2016  Reducing sex differences in children's empathy for animals through a training intervention  Sweden	Quantitative study  Reading-based empathy programme	Primary school  137 students Age: 5-11  Experimental: 80  Control: 57	7-point Likert-type scale, created ad-hoc to measure Grade of empathy	Reading session	Girls showed more empathy than boys ( $p < .01$ ). This main effect was qualified by a significant interaction effect between gender and condition in the group ( $p < .05$ ). However, in the experimental group, it was not statistically significant. Children who own a dog showed more empathy than children who do not. In this case, a significant gender effect was recorded for girls. Age/Empathy: negative correlation ( $p < .07$ ), the youngest show more empathy). Joy/Empathy: negative correlation confirmed ( $p < .01$ ).  This suggests that human education programs can reduce gender differences by increasing boys' empathy.

Ornaghi et al., 2014	Quantitative Study	Primary School (second grade)	Emotional Lexicon Test (ELT) (Grazzani, Ornaghi, & Piralli, 2011); Test of Emotion Comprehension (TEC) - Italian version (Albanese & Molina (2008); False belief battery (FB Battery) (Peskin & Astington, 2004); How I Feel in Different Situations (HIFDS) - Italian version (Bonino, Lo Coco, and Tani, 1998).	Reading training 2 months (15 1-hour sessions, twice a week in small groups) Follow up 6 months	Positive effects of the intervention; participants showed significant gains in their emotions comprehension ( $p=.0001$ ), theory of mind ( $p=.0002$ ) and emotional vocabulary ( $p=.005$ ). The experimental group achieved significantly better results than the control group for the overall TEC score, ( $p=.000001$ ), the reflexive component ( $p=.000001$ ). With regard to overall TEC performance, the size of the effect identified at post-test ( $d$ by Cohen= $0.80$ ; $r=.37$ ) was stable at follow-up ( $d$ by Cohen= $1.03$ ; $r=.46$ ). The scores for the reflection level also showed a stable effect size at post-test, (Cohen $d=0.86$ ; $r=.39$ ) and at follow-up (Cohen $d=1.02$ ; $r=.45$ ).
Enhancing social cognition by training children in emotion understanding: A primary school study  Italy	Reading and understanding emotions, theory of mind and empathy	110 students M: 7.3 years old 50% female  Experimental: 52 students; 53.8% female  Control: 58 students; 51.9% female			
Curtis et al., 2020	Longitudinal Quantitative Study	Primary School	Child Report of Sympathy Scale (Spinrad et al., 1999); Adapted Social Competence Scale of the Perceived Social Competence Scale (Eisenberg et al., 1995; Harter, 1982).	Reading sessions  (Two waves at a distance of 1,5 years; laboratory evaluation 2.5 - 3 hours)	ET was positively correlated ( $rs=0.12$ to $0.74$ ). The use of positively emotional words by parents and the quality of ET were positively correlated with self-control ( $rs=0.19$ and $0.17$ ) and children's understanding ( $rs=0.16$ and $0.15$ ) reported by teachers. Parents' use of positive emotional words was positively correlated with children's social behavior reported by parents in W2 ( $r=0.17$ ). Positive correlation between parents' ET in W1 and children's self-control in W2. Even excluding social behavior in W1, the ET of parents in W1 positively predicts children's self-control in W2. Self-control in W2 was positively associated with social behavior in W2.
Emotion talk in Chinese American immigrant families and longitudinal links to children's socioemotional competence  USA	Parent emotion talk (ET) and socio-emotional skills	Two waves: (W1) 207 children, (W2) 190 children.  207 children M: 7.4 years old 50.7% female			
Lysaker & Tonge, 2013	Quantitative Study	Primary School (second and third grade)	Wordless picture book (Paris & Paris, 2003); Reading the Mind in the Eyes Test (Baron-Cohen et al., 2001); Faux Pas Test (Baron-Cohen et al., 1999).	Reading training  8 weeks two sessions (45 minutes each) for week	The written responses, interventions and reflections demonstrate the acquisition of the ability to understand others' mind. Significant improvements in recognition of others' emotions ( $p<.001$ ), in social imagination during reading ( $p<.001$ ), in understanding when someone's feelings are injured ( $p<.001$ ), in comprehension while listening to a reading ( $p<.001$ ) and in narrative skills ( $p<.002$ ).
Learning to understand others through relationally oriented reading  USA	Literacy and social imagination (theory of mind)	22 students			

Jones et al., 2011  Two-year impacts of a universal school-based social-emotional and literacy intervention: An experiment in translational developmental research  USA	Quantitative Study  Education and socio-emotional development	Primary School (third and fourth grade)  18 schools 1184 students  Experimental: 630 students; M: 8.17 years old; 50.6% female  Control: 554 students; M: 8.18 years old; 51.3% female	Home Interview Questionnaire (Dalhberg et al., 1998); ADHD Symptomatology Scale (Milich et al., 1982) Diagnostic Interview Schedule for Children Predictive Scales (Lucas et al., 2001); Behavioral Assessment System for Children (Reynolds & Kamphaus, 1998); Social Competence Scale (Conduct Problems Prevention Research Group, 1999).	Reading training  2 years (from third to fourth grade)	Experimental school children reported slower hostile attribution style (HAB) rate increases ( $p < .1$ ), slower growth in the use of aggressive interpersonal negotiation strategies (AINS) ( $p < .1$ ) and a more marked decrease in depressive ( $p < .05$ ) and ADHD symptoms compared to control school children. Positive effects on social cognitions (for example, HAB, AINS) and socio-emotional symptoms (ADHD and depressive symptoms). Experimental school teachers reported slower growth in children's aggressive behavior ( $p < .05$ ) and increased social skills ( $p < .05$ ) (compared to the drop emerged in control schools) over two school years.
Brokamp et al., 2019  The relationship among students' reading performance, their classroom behavior, and teacher skills  Netherlands	Quantitative Study  Education and socio-emotional development	Primary School (third grade)  593 students M: 9.25 years old 51% female  66 teachers	AVI-test (Jongen & Krom, 2009); Behavior questionnaire (van Doorn, 2000); observation instrument (Houtveen, Brokamp, & Smits, 2012).	No intervention	Reading fluency at the beginning of the year is significantly associated with task-oriented behavior ( $p < .001$ ), emotional stability ( $p < .05$ ) and class behavior ( $p < .05$ ) at the end of the year. Effective teachers' book introductions are a useful factor to improve students' behavior and emotional stability ( $p < .05$ ).
Gordon, 2017  The impact of multicultural literature on empathy development in third-Grade students: A pilot study  USA	Qualitative Study  Intercultural education and empathy	Primary School (third grade)  17 students	Students' graphic organizers completed after readings; Motivation to Read Profile – Revised (MRP-R) (Malloy, Marinak, Gambrell, & Mazzoni, 2013); vocabulary probe.	Reading sessions  4 weeks	The vocabulary probe revealed that children had little knowledge of emotional language. No empathy improvements over time. Texts with multicultural contents made children focus on the foreign characters' emotions instead of dwelling only on the similarities with their personal experiences. The motivation to read always remained high. Children appreciated the multicultural aspects of the readings and approached the characters despite the cultural differences.
Morgan et al., 2012  Do poor readers feel angry, sad and unpopular?  USA	Longitudinal Quantitative Study  Reading and socio-emotional adjustment of children	Primary school  3308 M: 65.50 months incoming (5.46 years old) 48% female  Experimental: 331  Control: 2977	Angry/Distractibility and Sad/Lonely/Anxious perceptions; SDQ-I (Marsh, 1990); Reading Test from ECLS-K (Pollack et al., 2005).	No intervention	Third grade children who were weak readers ( $N = 331$ ) subsequently reported feeling angrier (32%), sadder (34%) or more unpopular (20%) than peers who were not weak readers (10%); in particular, feelings of sadness, worry and anxiety were frequently reported. Girls reported feeling significantly less angry and unpopular than boys. Children who were weak readers in third grade are more than twice as likely to report feeling angry or distracted in fifth grade.

Beck et. al, 2012  Relationship between language competence and emotional competence in middle childhood  Germany	Quantitative Study  Linguistic and emotional competence	Primary School  210 students M: 9,91 years old 60.9% female	Listing task (adapted from Kusche Affective Interview-Revised, Kusche, Beilke, & Greenberg, 1988); measures created ad-hoc; storytelling of book; ELFE 1-6 - German version (Lenhard & Schneider, 2006); Peabody Picture Vocabulary Test - German version (Dunn & Dunn, 2004).	No intervention	Correlation between receptive vocabulary and knowledge of declarative emotions ( $r=0.45$ ), between receptive vocabulary and mixed emotion awareness ( $r=0.44$ ); moderate correlation between receptive vocabulary and expressive emotions vocabulary ( $r=0.33$ ) and between receptive vocabulary and facial emotion recognition ( $r=0.32$ ). Older children have higher competences for each variable, but in general age and gender do not influence competences in both areas. The hypothesis test confirmed that the model used was effective ( $c=0.99$ ), highlighting that receptive vocabulary and declarative emotional knowledge are the most effective indicators for these competences.
Kumschick et al., 2014  "Reading and Feelings": The effects of a literature-based intervention designed to increase emotional competence in second and third graders  Germany	Quantitative Study  Reading and emotional competence	Primary School (third and fourth grade)  208 students  Experimental: 104 students; M: 9.94 years old  Control: 104 students; M: 7.91 years old	Laboratory of feelings, specially created board game	Reading training  8 weeks (two lessons per week of 45 minutes each)	Significant improvements in emotional vocabulary ( $p < 0.001$ ), explicit emotional knowledge ( $p < 0.001$ ) and recognition of masked feelings ( $p < 0.001$ ). Regarding the treatment effect on the recognition of masked feelings, we found that boys benefited much more than girls ( $p < 0.05$ ).
Venegas, 2019  "We listened to each other": Socioemotional growth in literature circles  USA	Case Study  Socio-emotional development	Primary School (fifth grade)  1 student 10 years old Female	Interviews; recordings and observations about Grace's interventions and interactions; Grace's role sheets.	Educational laboratory  8 weeks	Intra-personal skills: Grace improves impulse control and self-confidence through the intervention.  Interpersonal skills: better social awareness after the intervention; good levels of social metacognition in the second half of the literary circle; the intervention fosters Grace's empathy.
Tomé-Fernández et al., 2019  Values and intercultural experiences through picture books  Spain	Qualitative Study  Intercultural education	Primary School (fifth grade)  30 students M: 10.46 years old 56.6% female	Semi-structured interview created ad-hoc.	Educational laboratory	Reading stimulated students' empathy towards foreign characters. The study produced qualitative evidence of the usefulness of illustrated books in promoting sensitivity towards intercultural issues.

Stutler, 2011 Gifted girls' passion for fiction: The quest for meaning, growth, and self-actualization USA	Qualitative study Socio-emotional development	Middle School 8 students Age: 11-12 100% female	Audio recordings of discussions and interviews with parents; Reading of newspapers; Researcher's notes; Narrative vignettes.	Educational laboratory 1-2 per week: 19 sessions from February to June	Reading stimulates intellectual, emotional and imaginative growth. Girls experienced moments of "flow" while reading and read for their personal and cognitive growth, they built meanings while examining questions linked to their lives. Emotionally, girls possessed empathic skills and used them to form relationships with characters. They used emotional intensity and intelligence to gain insight about themselves and about others' experiences and feelings.
Undheim et al., 2011 Emotional and behavioral problems among school adolescents with and without reading difficulties as measured by the youth self-report: A one-year follow-up study Norway	Longitudinal Quantitative Study Reading difficulties and behavioral problems	Middle School 2464 Age: 12-14 50.7% female Experimental: 191 Control: 2273	Ad-hoc questionnaire for Socioeconomic status (SES); ad hoc interview (both created by researchers); YSF - Norwegian Version (Kvernmo & Heyerdahl, 1998).	No intervention	The total score for problematic behavior increased significantly from T1 to T2. The RD group showed a higher number of problems than the non-RD group in both T1 and T2 ( $p < 0.001$ ). 53% of adolescents with DD in T1 also reported them in T2. Externalizing problems also increased among those who did not have DD. There was no difference between those who had received a special education and those who had not, both in T1 and T2. Reading difficulties are a significant predictor of social problems one year later. Those who received special education and experienced DD in T1 showed more social problems than those who did not.
Chisholm et al., 2017 Mediating emotive empathy with informational text: Three students' think-aloud protocols of "Gettysburg: The Graphic Novel" USA	Case-study Education and socio-emotional development (empathy)	Middle School (eighth grade) 3 students Age: 13-14 33.3% female	A think-aloud interview protocol (VanSledright et al., 2006); Students' written assignments.	Educational laboratory 3 lessons (60 minutes each)	An emotionally meaningful reading experience emerged and these emotions influenced the students' meaning-building processes. They felt empathy for the characters. Researchers argue that students' visual and emotional reading of the graphic novel favored emotional empathy and historical empathy.
Tijms et al., 2018 Bibliotherapeutic book club intervention to promote reading skills and social-emotional competencies in low SES community-based high schools: A randomised controlled trial	Quantitative Study Literacy and socio-emotional development	Middle School Experimental: 40 students; M: 13.7 years old; 70% female Control: 50 students; M: 13.6 years old; 76% female	School Attitude Questionnaire (Smits & Vorst, 2008).	Bibliotherapy training 12 weeks (45 minutes for session, held weekly)	The intervention had positive and significant effects on the students' socio-emotional competences ( $p < .05$ ): ability to express oneself, scholastic self-concept and social-relational skills.

Netherlands Dylman et al., 2020	Quantitative Study	Middle and High School	Taghavi et al., (1999) translated into Swedish.	No intervention	General effect on vocabulary (Middle School: $p < .001$ ; High School: $p < .001$ ); the neutral words were the most produced ones (Middle School: $p < .001$ ), followed by the positive ones (Middle School: $p < .001$ ) and the negative ones. Gender effect (Middle School: $p = .021$ ; High School: $p = .001$ ) with a higher females' production of emotional words than the neutral ones. A significant relationship between frequent or high reading habits and positive and negative emotional words (Middle School $p = .029$ ; High School: $p = .012$ ).
Reading habits and emotional vocabulary in adolescents	Reading and emotional vocabulary	415 students  Experimental: 201 Middle School; M: 14 years old; 53.2% female; 214 High School; M: 17 years old; 60.3% female			
Sweden					
Yusuf et al., 2013	Quantitative Study	High School	Reading Comprehension Test (RCT) constructed by the researchers (Barrett & Smith, 1974).	Special reading sessions  8 weeks	The Experimental Group showed a greater increase compared to the Control Group (average effect size) ( $p < 0.05$ ).
Students' reading comprehension performance with emotional literacy-based strategy intervention	Emotional intelligence and reading comprehension	90 students M: 14 years old  Experimental: 45 students  Control: 45 students			
Malaysia					
Boatright & Allman, 2018	Case-study  Education and Empathy	High School (ninth and tenth grade)  Age: 14-16	Students' written assignments; Researchers' observations.	Educational laboratory  1 scholastic year	Students showed empathy for the characters, the will to understand their actions and choices. Students approached reading in a reflective and empathetic way, working collectively. Literary circles fostered cooperation and discussion of books' issues in a protected environment, but were also perceived as too restrictive by students.
Last year's choice is this year's voice: Valuing democratic practices in the classroom through student-selected literature					
USA					
Pang & Zhang, 2011	Quantitative study	High school	Observation grid, camera, questionnaire with closed and open answers, questionnaire and interview on reading habits, interests and difficulties in the task of understanding the text (all created ad hoc); assessment test ad-hoc.	Reading training  5 weeks	After 1st week: comprehension exercises' scores improved slightly. From 2 <sup>nd</sup> week: the scores increased in line with the average of the class and the average hyperactive behavior decreased significantly. By the 3 <sup>rd</sup> week, the 3 participants scored twice as high as the baseline scores. In the last week, the students showed only a quarter of the initial hyperactive behavior. After the intervention, the number of correct responses of the participants was inversely proportional to the number of unwanted behaviors. The performance in the last 3 weeks was better than the average of the class. In the generalisation phase (interruption of the intervention), performance returned to be similar
Reading intervention for secondary students with hyperactive behaviours in Hong Kong	Effectiveness of reading in mediating hyperactive behaviors	3 participants from a classroom of 40 Age: 15-16 33.3% female			
China					



Abdolrezapour & Tavakoli, 2012	Quantitative Study	High School 63 female students Age: 15-18 years old	Self-assessment questionnaire Trait Emotional Intelligence Questionnaire Adolescent Short Form (TEIQue-ASF) (Petrides et al., 2006).	Reading training 8 weeks (24 sessions)	to that of the pre-treatment phase. The exposure of EFL students to literature response activities positively influences their EQ: the experimental group had a statistically significant score compared to the control group ( $p < 0.05$ ). A difference also emerged between the two groups in the relationship between reading and comprehension activities ( $p = 0.000$ ) and between emotional intelligence and text understanding ( $r = 0.660$ , $p = 0.000$ ).
The relationship between emotional intelligence and EFL learners' achievement in reading comprehension Iran	Emotional reading and emotional intelligence	Experimental: 33 students Control: 30 students			
Gerrig et al., 2016	Quantitative Study	High School Experiment 1: 106 participants; 59.4% female Experiment 2: 110 participants; 58.2% female	Likert Scale created ad-hoc.	Educational laboratory	H1. The more readers liked the protagonists of the story, the higher was the measure of "escape rooting" (i.e. the more readers hoped for his escape). Readers who found the protagonist a moral character had higher expectations for his escape ( $p < .01$ ), but these expectations were not confirmed by a correlation with sympathy for the character ( $p < .10$ ). H2. Individual differences in empathy were related to the judgment of sympathy and morality, but the evidence is partial; readers who reported higher levels of empathy tended to report less sympathy for the characters in the text. H3. The involvement was positive and significantly correlated to the positive outcome ( $p < .05$ ). H4. The correlation between empathy and involvement in reading is positive and significant ( $p < .001$ ; $p < .05$ ). H5. The correlation between higher involvement and higher enjoyment was confirmed ( $p < .001$ ).
On the origins of readers' outcome preferences USA	Reading and emotional involvement				

## Appendix C

Table 6. Descriptive Results of Adulthood

Authors, Title, Country	Design, Intervention area	Sample	Evaluation tools	Intervention	Outcomes
McCreary & Marchant, 2017  Reading and empathy  USA	Quantitative Study  Education and empathy	University  696 university students Age: 18-25 80% female	Online survey through Qualtrics; partial adaptation of PISA Student Questionnaire (Organization for Economic Co-operation and Development, 2010); a part of Empathy Quotient Test (Lawrence, Shaw, Baker, Baron-Cohen, & David, 2004).	No intervention	Girls, in comparison to boys, reported higher levels of empathy, were involved in more recreational readings and showed more appreciation for reading. The perspective taking ability was significantly associated with the appreciation for reading in the general sample ( $p < 0.005$ ). Girls (but not boys) who reported higher levels of reading appreciation also had higher levels of empathy ( $p < 0.01$ ). In males the amount of non-recreational reading is related to less empathy ( $p < 0.05$ ).
Pytash 2013  Using YA literature to help preservice teachers deal with bullying and suicide  USA	Qualitative Study  Pedagogical education and empathy	University  22 pre-service teachers Age: 19-23 95.5% female	Interviews, online discussions.	Educational laboratory  30-40 minutes each	Three results: 1) "Previous life experiences": many participants knew a person who committed suicide and expressed their willingness to understand why it happened; 2) "the efferent and aesthetic continuum": the students used reading to gain practical and theoretical information on suicide and bullying issues; 3) "transactions as future teachers": the students developed empathy for the characters in the books and began to understand the reasons and feelings that can bring to suicide. They connected this experience to their need, as future teachers, to be empathetic with students.
Hoggan & Cranton, 2015  Promoting transformative learning through reading fiction  USA	Qualitative Study  Education	University  131 students Age: 20-60 62.6% female	Students' written reflections.	Educational laboratory	Three main results: "promoting change", "new perspectives" (awareness of new and different ways of perceiving the world) and "promoting critical reflections" (about themselves and the world). Other additional results concern: connections between history and personal life experiences, emotional stimulations by reading (and feelings of being able to express themselves freely) and identification of role models in the book characters.
Hartung et al., 2016  Taking perspective: Personal pronouns affect experiential aspects of literary reading  Netherlands	Quantitative Study  Reading and immersion experience	Adult  52 participants M: 21.4 years old 57.7 % female	Electrodermal activity (EDA) (Matlab R2013a, MathWorks, Natick, MA, USA); Interpersonal Reactivity Index (IRI) (Davis, 1983); Empathy Quotient	Reading session  90 minutes	Stories with first-person pronouns lead to higher levels of general immersion than the stories with third- person pronouns ( $p < 0.05$ ). The pronoun type has no significant influence on the ranking ( $p = 0.06$ ). There is a relationship between the scores of the immersion questionnaire and the appreciation of a history (Evaluation: $p < 0.001$ ; Classification: $p < 0.001$ ). People

			Questionnaire (EQ) (Lawrence et al., 2004); The story world absorption scale (SWAS), The narrative engagement questionnaire (NEQ) (Kuijpers, 2014; Buselle & Bilandzic, 2009) - parts of two scales		who score high in empathy seem to dive more easily ( $p < 0.05$ ). The EDA during reading, showed an effect in the opposite direction, although not wide. Here we observe more peaks in the EDA signal when participants read stories with third-person pronouns than those with the first-person pronouns ( $p = 0.06$ ), which is contrary to the direction of the effect in dive scores and appreciation measurements.
Hsu et al., 2014 Fiction feelings in Harry Potter: Haemodynamic response in the mid-cingulate cortex correlates with immersive reading experience  Germany	Study of functional neuroimaging  Immersion experience in reading and activation with fMRI	University  24 university students M 23.71 years old 66.6% female	Functional data were acquired on a Siemens Tim Trio 3 T MR scanner (Erlangen, Germany); online questionnaire and narrative engagement scales (Appel et al., 2002).	Reading session	The study showed that the dive values of the fear-inducing passages were significantly higher than those of the neutral passages ( $p < 0.001$ ). A higher activation was found in the central track during the reading of the fear-inducing passages compared to the reading of the neutral passages. At the neuronal level, mCC but not AI, (fundamental substrates of affective empathy) showed a greater correlation with the experience of diving for the passages of the Fear condition compared to the Neutral condition.
Iacozza et al., 2017 What do your eyes reveal about your foreign language? Reading emotional sentences in a native and foreign language  Spain	Quantitative Study  Emotional processing in mother tongue reading	Adult  54 participants  Experimental: 27 participants; M. 27.93 years old; 62.9% female  Control: 27 participants; M. 23.48 years old; 66.6% female	Empathy Questionnaire (EQ) - Spanish version (Lawrence et al., 2004); Kaufman Brief Intelligence Test (IQ) (Kaufman AS, Lichtenberger EO, 2005); Eye-tracker.	Reading session	An effect of emotion has been observed in pupillary response and evaluations. The effect of emotions on pupil dilation was smaller (half as much) when participants read sentences in a foreign language compared to reading in the mother tongue (native language: $p < .000$ ; foreign language: $p = .03$ ). This evidence has not been recorded in the explicit evaluations.
Altmann et al., 2012 The power of emotional valence—from cognitive to affective processes in reading  Germany	Study of functional neuroimaging  Reading and theory of mind; emotional activation with fMRI	Adult  Pre-study 32 participants 50% female  Study 24 participants M: 26.5 years old 50% female	Interpersonal Reactivity Index (IRI) - German version (Paulus, 2009); Analysis of fMRI data (Goebel et al., 2006) transformed into Talairach standard space (Talairach & Tournoux, 1988).	Reading session	In the pre-study: the valence strongly depended on the type of story (negative, neutral) ( $p < 0.001$ ). In the study: neutral and negative narratives share broad activation patterns, including brain areas that are regularly reported for cognitive ToM, i.e. dmPFC, bilateral TP and posterior upper temporal gyrus. The negative valence activated caudate body, left middle-dorsal thalamus, left amygdala and large fronto-temporal network. The satisfaction activated bilateral anterior STG/TP, anterior MTG, IFG, lingual/fusiform gyrus and left posterior cingulate cortex. The valence and sympathy interaction was associated with activations of bilateral mPFC, supramarginal gyrus / TPJ, left dorsolateral

					prefrontal cortex and mPFC Bilateral anterior insula and right posterior cingulate cortex showed a stronger coupling with mPFC for individuals with a stronger tendency to feel concern for other people ( $p < 0.05$ ).
Tabullo et al., 2018	Quantitative Study	University	Reading the Mind in the Eyes Test (RMET) (Baron-Cohen et al., 2001); Interpersonal Reactivity Index Scale (IRI) (Davis, 1980, 1983).	No intervention	Significant associations between RMET performance and: reading habits ( $p=.03$ ) and personal discomfort ( $p=.015$ ). For trait empathy, fantasy scores were higher in subjects who reported more frequent narrative reading times ( $p < .001$ ) and started recreational reading earlier ( $p=.014$ ), but tended to decrease with age ( $p < .001$ ). RMET performance was significantly associated with ART scores within the male group ( $p=.004$ ), but this effect was not observed in women. The association between Mind Theory performance and narrative print was significant for men ( $p=.002$ ) but not for women ( $p=.421$ ).
Associations between fiction reading, trait empathy and theory of mind ability	Reading and empathy, theory of mind	208 people Age: 18-59 years old M: 27.66 years old 65.86% female			
Argentina					
Koopman, 2015	Quantitative and Qualitative Study	University	Interpersonal Reactivity Index Scale (IRI), - adapted scales (Davis, 1980, 1983); Traumatic Pain Inventory (ITG) - adapted scale (Boelen et al., 2003) scale created ad-hoc.	Reading session	The foreground condition is able to evoke more emotions than other conditions. No difference in emotions after reading ( $p=0.038$ ) (significant data for the first group). Empathic understanding is greater in the original text and especially after reading. In general, the degree of reflection depends on the general characteristics of the person, whether he/she presents empathic traits or not. A general type of reflection is aroused in subjects who also present a greater empathic understanding ( $p=.034$ ).
Effects of "literariness" on emotions and on empathy and reflection after reading	Reading effects with foregrounding on Empathy and Affective responses, Empathic understanding	142 people (64.1% students) M: 32.07 years old (age: 17-73); 74.6% female			
Netherlands		Experimental: N=49 original text, N=40 without imagery, N=53 without foregrounding			
Junker & Jacquemin, 2017	Quantitative and Qualitative Study	University	Discussing text, standard analytical writing assignments, creative writing prompt.	Educational laboratory	Cognitive and affective empathy were strongly influenced by the perception of textual difficulty: higher levels of openness, awareness of multiple perspectives, awareness of the cultural framework and affective mental attitude coincided with the perception of a more interesting and intriguing text ( $p < .05$ ). Significant relationships between empathy and textual difficulty (negative; $p = .05$ ) and the ability to write (positive; $p < .001$ ). Creative writing tasks stimulate more empathic responses than tasks that require analytical writing ( $p < .001$ ). Empathy did not appear to increase over time.
How does literature affect empathy in students?	Reading and Empathy	42 students		1 semester	
USA					
Slay & Morton, 2020	Qualitative Study	University (Undergraduate)	Students' written reflections and	Educational laboratory	1) Identity: a lack of interest or attention in identifying the cultures

Engaging pre-service teachers in read alouds	Education and reading aloud	48 pre-service teachers	charts about the reading aloud experiences.	20 weeks 2 semesters	described in the readings; 2) Pedagogy: an undeveloped sense efficacy;3) Empathy: the reflections reveal empathy felt for the different cultures represented in the readings and for future students. The readings aloud therefore stimulated empathic reactions.
USA					
Glenn, 2012	Qualitative Study	University	Individual responses from the preservice teachers created ad-hoc.	Educational laboratory	The reading conducted by teachers, aimed at promoting empathy towards the characters, has generated racial considerations driven by the desire to weave universal connections that unite all human beings.
Developing understandings of race: Preservice teachers' counter-narrative (re)constructions of people of color in young adult literature	Intercultural education	14 English preservice teachers 93% female		3-4 weeks (3 days working)	
USA					
Chamberlain, 2018	Qualitative Study	Adult	Structured interview created ad-hoc analyzed with phenomenographic protocol.	Reading sessions	Being in a reading group had a therapeutic effect; participants were able to empathise with others and share opinions and experiences. This was facilitated by a safe and tolerant environment. Using phenomenographic techniques, the act of reading aloud could be seen as a development of trust in the participants, as an activity through which they could find their voice and identity.
The experience of older adults who participate in a bibliotherapy/poetry group in an older adult inpatient mental health assessment and treatment ward	Reading aloud and emotional experience	4 people in the psychiatric ward		10 one-hour sessions once a week	
England					

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