



Maite Diez Iruretagoyena , Chamarrita Farkas , Candelaria Latorre , and
Magdalena Cerón 
Pontificia Universidad Católica de Chile

Mental State Language in Chilean Storybooks: Does Writers' Nationality and Gender Matter?

Children's books are a useful tool to enhance mentalization since they usually contain multiple references to mental states, thus providing potential opportunities to mentalize. Studying the factors that influence mentalization is fundamental since this ability is essential for children's socioemotional development. An exploratory study was designed to analyze mental state language (MSL) in storybooks for 3- and 4-year-old children in Chile and compare MSL use by writers of different nationalities and sexes. The sample consisted of 40 books from male and female writers from Chile and Spain. Our results showed that the most referred mental references were desires, cognitions, and emotions. Differences were found according to the writers' nationality for cognitions, as well as in the interaction between nationality and gender for references to desires and cognitions. Our results imply that books differ in frequency and type of references to mental states, according to the cultural background of the writer.

Key words: Mental state language, children's books, writers' nationality, writers' sex, exploratory study

Address for correspondence: Maite Diez

Pontificia Universidad Católica de Chile, Avenida Vicuña Mackenna 4860, Macul, Santiago, Chile.

E-mail: madiez@uc.cl

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Human beings have the ability to mentalize or think about themselves and others in terms of mental states (Wellman et al., 2001). Mentalizing is the capacity to understand the underlying beliefs, desires, thoughts, and feelings of one's own actions and behaviors, and those of others (Fonagy & Allison, 2011). This ability is essential for emotional and socio-cognitive development (Farkas et al., 2017a), which refers to the acquisition of key social and emotional skills in children that enable them to adapt to their social environment and achieve emotional and behavioral regulation, understand their emotions and those of others, and engage in positive social interactions (Farkas et al., 2017b).

Studying the factors that affect mentalization and the ways in which it can be enhanced is important, as mentalization has been shown to have significant implications for children, such as in the establishment of attachment (Fonagy & Allison, 2011), communication and cooperation (Ruffman et al., 2002), the organization of the self and affect regulation (Fonagy et al., 2010). Due to the relevance of mental state language, studies have been conducted to determine the contexts or interactions where greater use of these language is promoted, as well as the variables of adults that are related to a higher and richer use of mental state references. In terms of contexts, it has been observed that during the shared reading of children's stories, adults and children use more mental references than in other contexts, such as play (Farkas et al., 2018; Hoff Ginsberg, 1991). Regarding adult variables, research has found that contextual factors such as culture and socioeconomic status, influence the frequency and complexity of mental state references (Chang et al., 2017). Studies conducted in Chile have shown that mothers with lower socioeconomic status (SES) use mental state terms less frequently compared to mothers with middle or high SES (Álvarez et al., 2019). Additionally, educational level has been identified as the strongest predictor of variations in the use of mental state terms among mothers of children aged 12 to 30 months (Álvarez et al., 2019). Similarly, personal factors such as sex have been associated with differences in the use of mental references, with women generally using more mental state references than men, although these results are not conclusive (LaBounty et al., 2008). The present study aims to deepen the knowledge of the mental state language (MSL) contained in storybooks, by analyzing the use of mental references in their written text, a variable which has been less studied compared to how adults use mental references in their spontaneous verbal interactions. The study also seeks to explore differences between MSL in stories, taking into account the authors' sex and cultural background.

Development of Mentalization

Knowledge of mental states needs to be transmitted to the child from an early age in the interaction with adults, in order for the child to achieve an understanding of them. This occurs through parental mentalization, which is the tendency of caregivers to treat children as individuals with minds, and therefore capable of intentional behaviors (Meins et al., 2002). As caregivers interact using mental references, children begin

to develop sensitivity towards their mental states and those of others, thus fostering mentalization (Fonagy et al., 2010). Language plays a central role in this process, as it enables symbolic interactions that are essential for the development of mentalization (Farkas et al., 2018). Therefore, language serves as the most important channel for the promotion of mentalization (Zucchi et al., 2006).

It has been observed that the most frequent mental state references used by mothers with their children are desires, emotions, and cognitions (Taumoepeau & Ruffman, 2006), but their use varies according to the child's age and in line with their cognitive development. Mothers initially focus on desires when talking to their children, especially around 15 months old. By 24 to 33 months, references to desires decrease, emotions remain stable, and the focus shifts to more abstract concepts like thoughts and beliefs (Taumoepeau & Ruffman, 2006).

Storybooks as an Opportunity to Mentalize

There are different contexts in which adults can transmit MSL to children, such as daily routines, play, and storybook reading. Storybooks usually contain multiple references to cognitive terms, emotional terms, desires, obligations, wills, and moral assessments (Dyer, Shatz, & Wellman, 2000), thus providing multiple potential opportunities to mentalize. Hoff-Ginsberg (1991) revealed that when adults read stories to children, their MSL tends to be more complex and richer than during other types of activities, such as playing, eating or dressing. Likewise, another study conducted with 12 and 30-month-old Chilean children found that mothers used more references to mental states in the context of storybook reading, compared to free play, concluding that storybook reading is a particularly useful and powerful tool to enhance mentalization in children (Álvarez et al., 2019).

Storybooks contain a “standard” amount of MSL (implicit in the written text and referred to as “nonspontaneous” production of MSL) and a “spontaneous” amount of MSL generated by each adult during the reading, which is influenced by the story as well as their MSL skills. Studies have shown that mothers tend to help their children identify, interpret, and evaluate specific emotions presented in books (Kristen & Sodian, 2014). In addition, they usually check children's comprehension by referring to their mental states, for example, asking them if they understood or not (de Rosnay & Hughes, 2006). This interaction enhances the child's understanding of mental states and promotes a rich dialogue between the adult and child. Research has been done regarding storybook reading as a favorable context for the development of MSL. However, less attention has been given to the nonspontaneous production of MSL embedded within the written text of storybooks themselves.

The few studies conducted on this topic have found that children's stories are rich in explicit verbal references to mental states (Dyer et al., 2000). Therefore, it becomes relevant to study the MSL in storybooks, which can provide a measure regarding the contribution that the text gives children with respect to these states (Dyer et al., 2000). Particularly, studying the storybook's text is fundamental because it is the text itself that offers multiple potential opportunities to mentalize, when talking about the character's

mental world. Therefore, the written text, which represents nonspontaneous MSL, serves as the foundation for the reading interaction and can influence the caregiver's ability to engage in conversations MSL-rich conversations with the child. Studies have shown that there are significant differences between storybook's texts, and therefore, it is relevant to analyze this in more detail, with the aim of promoting storybooks that have higher mentalizing language and can promote this competency in children and adults.

In addition, this is particularly relevant at the age of 3-4 years, since during this stage children begin to understand that other people have feelings and intentions different from their own (Dunn, Bretherton, & Munn, 1987) and begin to understand that actions are caused by beliefs (Fonagy & Allison, 2011). Also, at 3-4 years, all Chilean children should attend the school system, which brings them new challenges for their social interactions and socio-emotional development. Therefore, it is a crucial stage for mentalization and the development of the Theory of Mind (Premack & Woodruff, 1978). Theory of Mind has been studied as a predictor of children's social skills in later childhood (Wellman, 2018). It has also been associated with prosocial behaviors (Imuta et al., 2016) and peer acceptance (Ronchi et al., 2020).

MSL in storybooks has recently become an object of study, because of its importance in the development of mentalization in children. Previous studies analyzing the text of storybooks have categorized mental state words into various categories and subcategories. Categories include desires, cognitions, emotions, psychological attributes, mood states, physiological states, perception, figurative language, ambiguous internal states, causal language, factual language, bonds with the child's life, and physical expressions (See Table 2 for categories and subcategories). It has been observed that the most frequent mental state references used in interaction with preschool children are desires, emotions, and cognitions (Taumoepeau & Ruffman, 2006).

Mental State Language in Stories and its Relation to Writer's Characteristics

Since storybooks are a potential powerful tool to enhance mentalization, it is relevant to analyze the MSL they contain and the possible variables that may affect it. From this point of view, the figure of the writer is particularly important, and has been insufficiently studied. The present study focuses on exploring the influence of two writers' variables on MSL: nationality and sex.

With respect to the variables considered in this study, there are few studies conducted regarding nationality, with divergent results. Dyer-Seymour et al. (2004) compared children's stories in English and Japanese, finding no differences between them in the use of references to mental states, whereas Shatz et al. (2006) made a comparison of the same stories in English and Italian, finding a greater use of these references in the Italian storybooks. However, there are currently no studies that compare stories with authors of different nationalities who speak the same language. This distinction is relevant because, although studies that compare stories in different languages contribute to the understanding of mentalization, they have not controlled

the influence of the language variable. Language shapes how mental states are expressed and interpreted, and therefore, it could significantly influence the analysis. For example, in English "I'm sorry" implies a reference to emotion, while in Spanish the word "perdón" does not entail a mental reference. There are also subtle but fundamental variations between languages, that can influence these comparisons. For example, some languages, such as Chinese, have words to capture subtle variations in mental states but others, such as English, do not. In Chinese, word "悔恨" (huǐhèn), expresses a deep, regretful feeling that includes self-reproach, whereas the English equivalent "regret" does not fully encapsulate the same depth and nuance. Cultural differences in the use and interpretation of mental state language also play a significant role. In Chinese culture, expressing emotions and mental states can be more context-dependent and influenced by social harmony and group dynamics, whereas in English-speaking cultures, there is often a more direct and individualistic expression of mental states. These cultural nuances and subtle variations in language use can significantly impact the way mental states are referenced and understood in literature, and therefore the rationale of controlling language is to clarify specifically if cultural background can shape MSL. The comparison of same-language storybooks written by authors of different nationalities is a novel study that allows us to inquire differences in MSL mediated by culture and controlling language, which is what this study intended to do when comparing stories of Chilean and Spanish writers. This study aims to explore and shed new light on the cultural impact on the use of MSL. It is important to note that in this study, nationality was included as it is considered a significant variable that can influence MSL through cultural background (Rieffe et al, 2006).

Regarding the second variable, sex, it has been observed that storybooks serve as instruments to transmit gender roles and social worth, either through the images or the text (García, 2012). The relation between MSL and sex has been mainly studied in the parent-child interaction. Differences have been found in narratives about emotions between children and their parents, where mothers speak more than fathers about emotions (Fivush et al., 2000). Sex differences have also been found in emotional expression, where women express more internalizing emotions (e.g., sadness) and men express more externalizing emotions (e.g., anger) (Chaplin & Aldao, 2013). Although differences in MSL according to sex have not been studied in non-parent adults, these results would suggest that women might use more references to emotions in their MSL than men, that men might use more references to cognitions, and that other differences might be seen in terms of a greater emphasis on the interpersonal aspects of relationships. There are no studies that have specifically analyzed sex differences in the text of children's stories according to the sex of the writer. However, it should be expected that these differences mentioned above are also reflected when they write children's stories.

Finally, studies have suggested an interaction between nationality and sex. On this matter, Hofstede (2011) classifies different countries based on 6 dimensions, one of which is masculinity vs. femininity. This dimension, located in a continuum, refers to the distribution of values according to sex, differentiating between male and female

societies. In more feminine societies there is minimal emotional differentiation and social roles between sexes, and mothers and fathers are equally responsible for facts and feelings, among others, while in more masculine societies there is a maximum emotional and role differentiation between sexes, prevailing the belief that fathers deal with facts and mothers with emotions. In this dimension, considering an index of 53 countries, Spain has a higher score than Chile in masculinity (a score of 42 for Spain and 28 for Chile, in a range of 5-95), indicating more accentuated emotional differences and social roles between genders in Spain, compared to Chile (Hofstede, 2011).

The Present Study

The present exploratory study aimed to contribute to knowledge and shed new light on the influence of the variables nationality and sex of writer in the MSL of storybooks for 3 and 4-year-old children. Based on the background reviewed, the objectives of this study were to analyze the presence of mental references in the text of children's stories available in Chile for 3 and 4-year-old children and compare them considering the nationality (Chilean, Spanish) and sex of the writers.

Regarding the first objective, richness in mental references was expected to be found in storybooks, with a higher frequency of references to cognitions, emotions, and desires (Taumoepeau & Ruffman, 2006). For the second objective, a greater frequency of references to mental states was anticipated in the books of Spanish writers (Rieffe et al, 2006; Shatz et al., 2006). In addition, a higher frequency of emotions in stories by female writers, and of cognitions in stories by male writers was foreseen (Chaplin & Aldao, 2013; Fivush et al., 2000). Finally, an interaction between the nationality and sex variables was anticipated, with greater differences by sex expected among Spanish writers, compared to Chilean writers. This expectation aligns with Hofstede's masculinity dimension, which suggests that more masculine societies exhibit greater emotional differentiation and distinct social roles between genders.

Method

Design

The study used a cross-sectional, descriptive and comparative design with a quantitative methodology. The use of mental references in the text of storybooks available in Chile for 3-4-year-old children was described and then compared according to nationality and sex of the writers.

Sample

The sample consisted of 40 storybooks available in Chile and aimed at 3-4-year-old children, chosen according to two variables: nationality and sex of the writers (10 stories for Chilean male writers, 10 for Chilean female writers, 10 for Spanish male writers, and 10 for Spanish female writers). These stories were randomly selected from the database of a larger research, in which this study was included, and whose aim was to design, implement and evaluate an intervention in mentalization based on storybooks

for 3 and 4-year-old children. For this research, an initial database of 665 stories was built from different sources such as bookstores, libraries, plans for reader's promotion, etc., with the following criteria for inclusion: books that were children's stories, targeted for children between 2 and 5 years old and that had written text. Activity or poetry books, as well as any storybooks that were not available in Spanish and that included more than five stories, were excluded. The database was subsequently revised according to the age assigned to each storybook, for which the original source, the publisher and one major source's recommendations such as Amazon were considered. To determine the designated age to each story, the agreement in at least two of the three sources referred above was required. The final database consisted of 273 stories, from which 40 stories were randomly chosen for this study. An equal proportion of Chilean and Spanish, and male and female writers was intended.

The 40 books analyzed in this study were written between 2002 and 2017. Of these books, 50% were written by men and the other 50% by women. In addition, 50% of the books were written by Chileans and 50% by Spaniards. The average number of pages in the storybooks was 21.18 (*S.D.* = 11.948, range 1 - 40) and the average number of words was 385.55 (*S.D.* = 299.184, range 43 - 1044) (see Table 1).

Coding Procedure

Once the sample was selected, the storybook texts were transcribed into a Word table to facilitate coding. For the coding of the MSL, the system used by the main

Table 1

Characterization of the Children's Storybooks Sample

Year of book publication		
2002 – 2005	4	10
2006 – 2009	5	12.5
2010 – 2013	10	25
2014 – 2017	20	50
No info.	1	2.5
Writer's sex		
Male	20	50
Female	20	50
Writer's nationality		
Chilean	20	50
Spanish	20	50
	Min-Max	M (S.D.)
Number of pages	1 – 40	21.18 (11.948)
Number of words	43 - 1044	385.55 (299.184)

Table 2*Description of the Mental State Language's Coding System*

Categories	Sub-category	Example*
Desires	Desires	"I wish I had that pet."
Cognitions	Preferences expressed in the form of a person's experience	"I prefer oranges instead of pears."
	Preferences expressed in the form of an attribute of an object-activity-experience	"My favorite toy is the car."
	Attention processes	"John, pay attention!"
	Memory processes	"Do you remember that time when..."
	Thinking processes	"John asked himself."
	Complex cognitive processes: Rational	"The teacher is going to teach us."
Emotions	Complex cognitive processes: Creative	"I have a great idea!"
	Primary emotions	"John had a sad face."
	Secondary emotions	"John was very embarrassed."
	Emotional processes	"Pepa was in love with me."
Psychological Attributes	General psychological attributes	"John is a very curious child."
	Psychological attributes in regulation	"The teacher said I am very obedient..."
	Psychological attributes in de-regulation	"...but sometimes I am also messy."
Mood States		"Are you bored?"
Physiological States		"Maria was falling asleep."
Perception	Sensory Perceptions	"Did you hear that?!"
Figurative Language	Perceptions to guide attention	"John, please look at me."
	Figurative language – Desires	"I'm dying for ice cream."
	Figurative language cognitions	"It's been spinning in her head."
	Figurative language – Emotions	"He was left with his mouth wide open."
	Figurative language – Psychological attributes	"Johnny is such a donkey."
	Figurative language – Moods	"Sara has a dark cloud hanging over her."
	Figurative language – Physiological states	"I'm so tired. I'm out of battery."
	Figurative language – Perception	"Nosy Margaret was eavesdropping through the door."
	Figurative language – Physical expressions	"I felt like a rock."

Table 2*Description of the Mental State Language's Coding System (Continued)*

Categories	Sub-category	Example*
Ambiguous Internal States		"¿How are you feeling? "So so."
Causal Language		"You fell because you didn't tie your shoes."
Factual language		"Hens lay eggs."
Bonds with the child's life	Emotional bond	"Andrew is sad, just like you were the other day."
	Experience / behavioral bond	"Here is a pacifier, look; it looks like your pacifier."
	Inaccurate bond	"Look at this... just like you the other day."
Physical Expressions		"That girl is crying."

Source: FONDECYT 1180047

Note: *Examples are given in English for the purpose of publication

research in which this study was included, was applied. The coding was carried out by a team of 5 coders previously trained, who reached at least 85% of agreement with the master code (who was the principal researcher). The disagreements were reviewed by the complete team and solved together.

This system codes different references to mental states, which are organized into categories and subcategories (see Table 2). First, references are organized into content and support categories. Content categories refer to mental contents and are composed of desires, cognitions, emotions, psychological attributes, mood states, physiological states, perception, figurative language, and ambiguous internal states. Support categories are not mental, but they support mental activity. These are causal language, factual language, bonds with the child's life and physical expressions. Some of the mentioned categories are divided into subcategories, as shown in the following table.

Once all the mental state references were coded, the proportions of the different categories and subcategories were calculated. This proportion was calculated in relation to the number of words (based on 100 words), as a way of controlling the great variability observed in the number of words in the stories (range 43 to 1044, S.D. = 299.184). Thus, a proportion of "1" indicates that for each 100 words, there is 1 mention of that specific reference. In addition, mental references were scored in two ways: as tokens, which refers to the frequency or all occurrences of these terms within a category (number of words mentioned, regardless of whether they are repeated or not), and as types, which refers to the variability or occurrence of different terms within a category (different concepts mentioned, without considering repetitions), as has been proposed by other authors (see Dyer et al., 2000). Then, the minimum score possible to obtain is 0, and the maximum is 100. As a reference, in a study conducted with a sample of children's books from four countries, the mean for the sum of all the references was

7.9 (for tokens, 4.9 for types), and the mean for the references considered in this study was between 0.19 and 1.07 (for tokens, 0.17 to 0.73 for types).

Of the 13 categories mentioned in Table 2, only seven were taken into account for this study: desires, cognitions, emotions, psychological attributes, mood states, physiological states and physical expressions (with their respective subcategories). The first three were selected because they are the ones that have been most studied in different investigations in this subject (see, for example, Dyer & Wellman, 2000), and they are the ones in which differences have been found according to gender. The other four, although less studied, were chosen because of their relationship with emotions and feeling (e.g., physical expressions, moods), as well as considering that they could show interesting differences between the variables (e.g., psychological attributes).

Data Analysis

For the first objective of this study, a descriptive analysis of the MSL present in the selected children's stories was carried out. For the second objective, comparative analyses were performed through nonparametric tests (U Mann-Whitney test) since the distribution of the data was not normal. Finally, to control potential interactions between culture and sex, nonparametric tests were used to compare independent samples (U Mann-Whitney tests), first comparing Spanish and Chilean writers controlling sex, and then between male and female writers controlling culture, and using the same method to address multiple comparisons.

To address the multiple comparisons within the same MSL construct, the false discovery rate control was used (Benjamini-Hochberg procedure), due to its benefits over the Bonferroni correction method (i.e., $p \leq d \times i/n$, where p was the p -value ordered in ascending order, $d = .005$, i = the specific order of that value, and n = total number of comparisons) (Glickman et al., 2014).

Results

Description of the Mental State Language Present in Chilean Children's Storybooks

The most frequently mentioned categories in the storybooks were desires ($M = 0.89$ for tokens and $M = 0.41$ for types), emotions ($M = 1.16$ for tokens and $M = 0.70$ for types) and cognitions ($M = 1.30$ for tokens and $M = 0.99$ for types). For further details considering the sample segmented by nationality and sex of the writers, see Tables 3 and 4.

The most frequently mentioned subcategories were primary emotions ($M = 1.04$ for tokens and $M = 0.60$ for types), desires ($M = 0.72$ for tokens and $M = 0.29$ for types) and thinking processes ($M = 0.61$ for tokens and $M = 0.38$ for types) (see Tables 5 and 6).

Comparing Mental State References by Writer's Nationality (Chilean or Spanish)

Table 3*Descriptions of Mental State Language's Categories by Writer's Nationality*

	Chilean Writers		Spanish Writers		U of Mann-Whitney (p)
	M	S.D.	M	S.D.	
Desires					
Proportion of tokens	0.59	0.887	1.19	2.762	162.00 (.314)
Proportion of types	0.43	0.587	0.40	0.377	175.00 (.512)
Cognitions					
Proportion of tokens	1.00	1.393	1.61	0.605	102.00 (.007)
Proportion of types	0.90	1.333	1.07	0.477	128.50 (.052)
Emotions					
Proportion of tokens	1.54	2.268	0.79	0.744	169.00 (.414)
Proportion of types	0.95	0.833	0.46	0.401	137.00 (.091)
Psychological Attributes					
Proportion of tokens	0.33	0.499	0.21	0.309	197.00 (.947)
Proportion of types	0.30	0.500	0.21	0.309	194.00 (.883)
Mood states					
Proportion of tokens	0.25	0.440	0.34	0.347	145.00 (.142)
Proportion of types	0.23	0.431	0.30	0.321	147.00 (.157)
Physiological states					
Proportion of tokens	0.16	0.300	0.24	0.239	135.00 (.081)
Proportion of types	0.15	0.300	0.19	0.195	137.00 (.091)
Physical expressions					
Proportion of tokens	0.57	0.780	0.36	0.461	195.00 (.904)
Proportion of types	0.50	0.713	0.20	0.230	177.00 (.547)

Note: p-values in bold represent comparisons that were considered significant following the false discovery rate control procedure.

Table 4*Descriptions of Mental State Language's Categories by Writer's Sex*

	Male		Female		U of Mann-Whitney (p)
	M	S.D.	M	S.D.	
Desires					
Proportion of tokens	0.71	0.846	1.07	2.798	172.00 (.461)
Proportion of types	0.50	0.505	0.33	0.465	156.00 (.242)
Cognitions					
Proportion of tokens	1.66	1.273	0.95	0.786	130.00 (.060)
Proportion of types	1.22	1.182	0.75	0.710	141.00 (.114)
Emotions					
Proportion of tokens	0.87	0.641	1.46	2.323	194.00 (.883)
Proportion of types	0.68	0.573	0.73	0.806	187.00 (.738)
Psychological Attributes					
Proportion of tokens	0.32	0.438	0.23	0.395	197.00 (.947)
Proportion of types	0.30	0.436	0.22	0.395	200.00 (1.000)
Mood states					
Proportion of tokens	0.21	0.260	0.38	0.484	166.00 (.369)
Proportion of types	0.19	0.251	0.35	0.463	165.00 (.355)
Physiological states					
Proportion of tokens	0.30	0.313	0.09	0.173	114.50 (.020)
Proportion of types	0.27	0.307	0.07	0.124	116.50 (.023)
Physical expressions					
Proportion of tokens	0.48	0.524	0.45	0.756	169.00 (.414)
Proportion of types	0.36	0.381	0.34	0.680	164.00 (.341)

Note: p-values in bold represent comparisons that were considered significant following the false discovery rate control procedure.

Table 5*Descriptions of Mental State Language's Subcategories by Writer's Nationality*

	Chilean Writers		Spanish Writers		U of Mann-Whitney (p)
	M	S.D.	M	S.D.	
Desires					
Proportion of tokens	0.51	0.880	0.93	2.793	179.00 (.583)
Proportion of types	0.36	0.561	0.22	0.299	182.00 (.640)
Preferences expressed as a person's experience					
Proportion of tokens	0.06	0.159	0.26	0.384	132.00 (.068)
Proportion of types	0.06	0.159	0.17	0.227	134.00 (.076)
Preferences expressed as an attribute of an object-activity-experience	0.87	0.641	1.46	2.323	194.00 (.883)
Proportion of tokens	0.02	0.071	0.01	0.035	199.50 (.989)
Proportion of types	0.02	0.071	0.01	0.035	199.50 (.989)
Attention processes					
Proportion of tokens	0.11	0.272	0.18	0.303	158.00 (.265)
Proportion of types	0.11	0.272	0.15	0.234	161.00 (.301)
Memory processes					
Proportion of tokens	0.04	0.167	0.16	0.200	111.00 (.015)
Proportion of types	0.04	0.167	0.14	0.179	111.00 (.015)
Thinking processes					
Proportion of tokens	0.45	0.668	0.77	0.553	114.00 (.020)
Proportion of types	0.36	0.536	0.41	0.280	145.00 (.142)
Cognitive processes complex; rational					
Proportion of tokens					
Proportion of types	0.24	0.678	0.30	0.276	126.00 (.046)
Cognitive processes complex; creative					
Proportion of tokens	0.15	0.292	0.10	0.219	196.50 (.925)
Proportion of types	0.15	0.292	0.07	0.144	193.50 (.862)
Primary emotions					
Proportion of tokens	1.45	2.273	0.63	0.703	157.00 (.253)
Proportion of types	0.87	0.828	0.32	0.331	127.00 (.049)
Secondary emotions					
Proportion of tokens	0.07	0.156	0.13	0.198	155.00 (.231)
Proportion of types	0.06	0.138	0.11	0.175	160.00 (.289)
Emotional processes					
Proportion of tokens	0.01	0.051	0.03	0.087	179.50 (.583)
Proportion of types	0.01	0.051	0.03	0.087	179.50 (.583)

Note: p-values in bold represent comparisons that were considered significant following the false discovery rate control procedure.

Table 6*Descriptions of the Subcategories of Mental State Language According to the Writer's Sex*

	Male		Female		U de Mann-Whitney (Sig.)
	Media	S.D.	Media	S.D.	
Desires					
Proportion of tokens	0.52	0.819	0.92	2.812	172.50 (.461)
Proportion of types	0.34	0.451	0.24	0.454	164.50 (.341)
Preferences expressed as a person's experience					
Proportion of tokens	0.19	0.277	0.13	0.339	159.50 (.277)
Proportion of types	0.16	0.237	0.07	0.153	158.50 (.265)
Preferences expressed as an attribute of an object activity-experience					
Proportion of tokens	0.01	0.035	0.02	0.071	199.50 (.989)
Proportion of types	0.01	0.035	0.02	0.071	199.50 (.989)
Attention processes					
Proportion of tokens	0.16	0.286	0.14	0.293	188.00 (.758)
Proportion of types	0.15	0.285	0.11	0.217	187.00 (.738)
Memory processes					
Proportion of tokens	0.16	0.236	0.05	0.117	147.00 (.157)
Proportion of types	0.15	0.229	0.03	0.075	142.00 (.121)
Thinking processes					
Proportion of tokens	0.81	0.743	0.41	0.413	139.50 (.102)
Proportion of types	0.45	0.490	0.32	0.344	170.50 (.429)
Cognitive processes complex; rational					
Proportion of tokens	0.42	0.712	0.22	0.289	182.00 (.640)
Proportion of types	0.36	0.680	0.18	0.242	187.00 (.738)
Cognitive processes complex; creative					
Proportion of tokens	0.12	0.257	0.13	0.261	184.00 (.678)
Proportion of types	0.12	0.257	0.10	0.207	187.00 (.738)
Primary emotions					
Proportion of tokens	0.75	0.614	1.33	2.339	195.00 (.904)
Proportion of types	0.58	0.571	0.61	0.793	174.00 (.495)
Secondary emotions					
Proportion of tokens	0.09	0.191	0.11	0.171	186.00 (.718)
Proportion of types	0.08	0.171	0.09	0.145	180.00 (.602)
Emotional processes					
Proportion of tokens	0.03	0.085	0.02	0.056	198.00 (.968)
Proportion of types	0.03	0.085	0.02	0.056	198.00 (.968)
Proportion of tokens	0.01	0.051	0.03	0.087	179.50 (.583)
Proportion of types	0.01	0.051	0.03	0.087	179.50 (.583)

Note: p-values in bold represent comparisons that were considered significant following the false discovery rate control procedure.

Differences were only observed in the mental references to the cognition's category (*Mann-Whitney* $U = 102.00$, $p = .007$ for tokens), where Spanish writers used more references than Chilean writers (see Table 3).

Regarding the subcategories, differences were observed in memory processes (*Mann-Whitney* $U = 111.00$, $p = .015$ for tokens and types), and thought processes (*Mann-Whitney* $U = 114.00$, $p = .020$ for tokens), both corresponding to the category of cognitions. In all of them, the Spanish writers used more references than Chilean writers.

Comparing Mental State References by Writer's Sex

No differences were found on categories when comparing mental state references by writer's sex, neither on subcategories.

Comparison of References to Mental States Controlling the Interaction between Culture and Sex

First, the comparative analyses controlling the variable sex showed no differences between Spanish and Chilean males, considering the categories. However, regarding the subcategories, differences were found for memory processes (*Mann-Whitney* $U = 19.00$, $p = .019$ for tokens, *Mann-Whitney* $U = 19.00$, $p = .019$ for types), with greater frequency and variability in Spanish male writers.

Considering Spanish and Chilean female writers, differences were observed in the category of desires (*Mann-Whitney* $U = 22.00$, $p = .035$ for tokens, *Mann-Whitney* $U = 22.00$, $p = .035$ for types), with a greater frequency and variability of mental references to desires on Spanish female writers than the Chilean ones. Regarding the subcategories, differences were found for the subcategory of desires (*Mann-Whitney* $U = 22.00$, $p = .035$ for types) in the same direction.

Then, controlling for culture, the comparative analyses showed no differences between Chilean male and female writers. Regarding Spanish writers, the analyses showed differences for the category of cognitions (*Mann-Whitney* $U = 15.00$, $p = .007$ for tokens), with a greater frequency of references to cognitions on male writers than female ones. Considering the subcategories, differences were found for the subcategory of memory processes (*Mann-Whitney* $U = 22.00$, $p = .035$ for types), with a greater variability in male writers.

Discussion

The present exploratory study aimed to contribute to knowledge and shed new light on the influence of the variables nationality and sex of writer in the MSL of storybooks for 3 and 4-year-old children.

In relation to the first objective of this study, results show that cognitions, emotions, and desires are the most frequent categories in the total sample of the

stories analyzed. This is consistent with what has been observed in the literature, these being the most studied mental references in previous research regarding the interaction between parents and children (e.g., Taumoepeau & Ruffman, 2008). This occurs because when children are between 2 and 4 years old, the MSL of parents focuses mainly on desires, cognitions, and emotions (Ruffman, Slade & Crowe, 2002, Taumoepeau & Ruffman, 2006, 2008). Although this study focuses on storybooks rather than parent-child interactions, the findings are consistent with the types of mental references typically used in those interactions. Thus, the results of this study are consistent with the development of children's mentalization, and support storybooks as a rich source of mental references that can nurture the mentalizing interactions between the child and the adult. This is fundamental considering the implications that MSL has regarding the socio-emotional development and attachment of the child, among other things (Fonagy & Allison, 2011, Fonagy et al., 1991, Ruffman et al., 2002).

In relation to the second objective, when comparing the storybooks according to the Chilean or Spanish nationality of the writers, differences were observed in one of the seven categories considered: cognitions, where a greater use of references by Spanish writers was observed (specifically references to processes of memory and thinking processes). In the subcategory memory processes, the difference was observed in tokens and types. However, in the category cognitions and the subcategory thinking processes, the difference was observed only in tokens. It is important to clarify that tokens refer to the frequency of mental state references, while types refer to their variability (unique terms). The distinction highlights two complementary constructs: frequency (tokens) can reflect cultural emphasis on certain mental state themes, while variability (types) may indicate the richness of language use. This approach aligns with prior research suggesting that frequency and variability provide complementary insights into linguistic and cultural practices (e.g., Ruffman et al., 2002; Taumoepeau & Ruffman, 2008). This distinction is fundamental, as it shows that the difference in MSL between these two nationalities might be more present when considering frequency but not variability in language. This suggests that cultural background, rather than language structure alone, may drive the observed differences. If language were the sole mediator, higher variability in mental references would also have been expected, reflecting linguistic diversity. Differences in variability of language in the same language could also be accounted for by socioeconomic level or education, variables which were not analyzed in this study, and should be taken into consideration in future studies. The results do not corroborate the initial hypothesis that Spanish writers would use more references to mental states in their writings, but rather indicate specific differences to each nationality.

These differences can be understood in light of the concept of collectivist versus individualist cultures (Triandis, 2001). In more collectivist cultures,

the upbringing of children emphasizes in conformity, obedience, security, and reliability, while in more individualistic cultures emphasis is placed on independence, exploration, creativity, and self-sufficiency. Thus, in more collectivist countries, we could expect language to be more focused on emotions, in order to achieve their regulation and self-regulation, while in more individualistic countries language we could expect language to be more focused on cognitions, which are linked to independence, exploration, creativity, and self-sufficiency. In the studies conducted, Chile has obtained lower scores in individualism compared to Spain (Hofstede, 2011; Triandis, 2001), and the results of the present study are consistent with this trend with regards to cognitions.

In the same line of individualism-collectivism dimensions, Schwartz (2006) analyzed the nature of relationships or boundaries between a person and a group, proposing autonomy (equivalent to individualism) and embeddedness (equivalent to collectivism) as two poles. The novelty of this perspective is that the author proposed two types of autonomy: the intellectual and the affective. The first one is related to encouraging individuals to follow their own ideas and intellectual directions independently, while the second one encourages individuals to seek positive affective experiences for themselves (Schwartz, 2006). In relation to this orientation, Chile was found closer to embeddedness and to affective autonomy, while Spain was closer to intellectual autonomy (Schwartz, 2006), which is also consistent with the results of this study. Thus, it is possible to infer that the MSL contained in children's storybooks is influenced by what is most valued in each society. However, it is necessary to bear in mind that this is an exploratory study, and therefore, future studies should continue to delve into the differences between stories written by writers with different nationalities. Culture is a complex construct that involves multiple variables. Future studies could further explore which specific factors of cultural background influence these differences in MSL. In addition, the relationship between culture and language is not linear, thus storybook traits and literature may also play a role in shaping cultural atmospheres. Literature and cultural products often have a reciprocal relationship, where cultural values influence the content of storybooks, and these storybooks, in turn, reinforce and perpetuate cultural norms and values. Further research could explore this dynamic interplay to better understand how cultural and literary influences interact over time.

In relation to our third objective, no differences were found in mental state references when considering the sex of the writer. The absence of differences between male and female writers can be influenced by several factors. One explanation could be the evolving gender norms and roles in contemporary societies. Over recent decades, the distinctions in emotional expression between men and women have become less pronounced, influenced by increasing gender equality and changing societal expectations (Cookson et al., 2023). However,

the current study did not explore the sex of the target audience, which could also influence the MSL in storybooks as it has been studied that parents' use of MSL varies depending on the sex of their child (Fivush et al, 2000; Adams, Kuebli, Boyle, & Fivush, 1995, Dunn et al., 1987). Although differences in MSL according to sex have not been studied in non-parent adults, these results could suggest a relevant difference in MSL use, and therefore, future studies should address this variable to gain a deeper understanding of its potential impact.

The Masculinity versus Femininity dimension studied by Hofstede (2001) provides insight into the distribution of values according to sex. Although Spain scores higher than Chile on the Masculinity scale, suggesting more pronounced gender roles, the lack of observed differences in MSL could indicate that these societal norms do not significantly impact literary expression, or as mentioned before, that there has been an evolution in gender norms and roles in contemporary societies.

Future research could explore these findings further by analyzing MSL in stories written by authors from other nationalities or cultural backgrounds. It would also be interesting to study whether the lack of differences is consistent in books written for children of different ages or in different literary genres. Understanding the underlying reasons for this convergence in MSL can provide deeper insights into the impact of cultural and societal changes on literature.

It is important to mention that the sample analyzed includes children's storybooks published between the year 2002 and 2017, finding 77.5% of the sample within the last 10 years. Thus, the results found with respect to differences in nationality and sex of the writers correspond to recently written children's storybooks. It would be interesting that future studies analyze how these differences behave in stories of greater antiquity or classic stories, which were not included in this study.

The present study has certain limitations, among these, the fact that the sample of books focused on a single age group. For this reason, it is important to be cautious with the interpretations of the results and their generalization. Future studies should explore the influence of these variables on MSL in children's storybooks for different age groups. In addition, this is an exploratory study whose objective was to observe a phenomenon that has been poorly studied. On this matter, future studies could analyze the variables in this study with greater depth, such as possible differences in the use of specific emotions like anger or grief, or differences in MSL according to the sex of the child. Another limitation is that this study only compared writers of two Spanish-speaking nationalities. Therefore, it would be interesting for future studies to explore differences considering other nationalities, for example, English-speaking. The nationality of a writer can influence various aspects of language, through language nuances (how mentalizing concepts are expressed, even in the same language), play and socialization practices, norms and values,

among many others. Future studies could expand the study of the influence of nationality in MSL, considering a wider variety of variables. Finally, future studies could also take into account the difference in reading habits in the cultures considered, as this can also be an important factor in the expression of MSL, regarding frequency and variability.

Despite these limitations, the results obtained confirm that children's storybooks are rich tools regarding mental state references (Dyer et al., 2000) and that they reflect cultural differences. Therefore, these results suggest that the material to which 3 and 4-year-old children in Chile are exposed to differs both in frequency and in the type of references to mental states, according to the nationality of the writer. These results are a contribution to the knowledge we have about MSL, which has been little explored in children's storybooks. As the language of the stories was controlled, the differences found in the mental references should not be due to language but rather to cultural aspects, which is an important point to take into account and continue exploring. For this reason, this study allows the opening of future questions regarding the influence of culture on the MSL contained in children's storybooks.

Conflict of Interest Disclosure

The Authors report no conflicts of interest.

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Research Ethics Statement

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Data Availability Statement

Data associated with the study will be made available upon reasonable request to the corresponding author.

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