

Harnessing Children’s Picture Books to Socialize Children About Pain and Injury: A Qualitative Study

Sarah B. Wallwork,^{*} Sue Nichols,[†] Abbie Jordan,[‡] Melanie Noel,[§]
Victoria J. Madden,^{*,¶,||} and G. Lorimer Moseley^{*}

^{*}IIMPACT in Health, Allied Health and Human Performance, University of South Australia, Adelaide, South Australia, Australia, [†]Education Futures, University of South Australia, Adelaide, South Australia, Australia, [‡]Department of Psychology & Centre for Pain Research, University of Bath, Bath, United Kingdom, [§]Department of Psychology, University of Calgary, Calgary, Alberta, Canada, [¶]Pain Unit, Department of Anaesthesia and Perioperative Medicine, University of Cape Town, Cape Town, South Africa, ^{||}HIV Mental Health Research Unit, Department of Psychiatry and Mental Health, Neuroscience Institute, University of Cape Town, Cape Town, South Africa

Abstract: Pain experiences are common during childhood (eg, “everyday” pain, vaccine injections) and are powerful opportunities for children to learn about pain and injury. These experiences likely inform fundamental and life-long beliefs about pain. There is scant research investigating the sociocultural contexts in which children learn about pain and injury. One unexplored context is the shared reading of picture books (eg, between parents/caregivers and children). In this study, we investigated whether shared reading of picture books that included depictions of pain and/or injury prompted parent/caregiver-child interactions. If interactions were observed, we explored what those interactions entailed. Twenty parents/caregivers (8 men, 12 women) and their children (n = 27; 10 boys, 17 girls) were recruited from libraries in South Australia. Parent/caregiver-child families chose from 8 books (7 fiction, 1 non-fiction) with varying amounts of pain/injury-related content. Shared reading interactions were video recorded, transcribed, and analyzed alongside analysis of the picture books using reflexive thematic analysis. Pain/injury-related interactions were observed between parents/caregivers and children during shared reading of picture books. Qualitative analyses generated 1 main theme and 3 subthemes. Findings identified that shared reading presented an opportunity for children’s understanding of pain and injury to be socialized through discussion of characters’ experiences. This included teaching children about pain and injury, as well as promoting empathy and emotional attunement toward characters who were depicted as being in pain. Finally, parents/caregivers often responded with observable/expressed amusement if pain/injury was depicted in a light-hearted or unrealistic way. Overall, shared reading of picture books presents an untapped opportunity to socialize children about pain and injury.

Perspective: Shared reading of picture books that have depictions of pain and/or injury can prompt parent/caregiver-child interactions about pain and injury. These interactions present critical opportunities that can be harnessed to promote children’s learning of adaptive pain-related concepts and behaviors during a critical developmental period.

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Address reprint requests to Sarah B. Wallwork, IIMPACT in Health, Allied Health and Human Performance, University of South Australia, GPO Box 2471, Adelaide, South Australia 5001, Australia. E-mail: sarah.wallwork@unisa.edu.au

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Pain is a common experience during childhood. “Everyday” pain (eg, minor injuries resulting in bumps, scratches, and bruises) occurs frequently in young children aged 3 to 5 years¹ and provides socialized opportunities for children to learn about pain and injury. Procedural pain is also experienced early in life (eg, vaccine injections, heel lances) and is associated with high distress and anxiety in children.² While

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chronic pain (pain for >3 months) is less common in early childhood, roughly 1 in 4 adolescents experience chronic pain.³ Exposure to these painful experiences, especially early in life, likely influences children's fundamental understanding of pain and injury and contributes to the development of their life-long beliefs about "how pain works." In addition, exposure to various sociocultural norms and practices is thought to influence several pain-related factors, including pain beliefs, pain coping, emotion processing, sensory perception, pain intensity, as well as the diagnosis and treatment of painful conditions.^{4,5} Despite this, there is little research investigating specific sociocultural contexts in which young children might learn about pain and injury, particularly through narratives depicted in media and books.

A recent study investigated how pain is depicted in young children's (aged 4–6 years) popular media (ie, television shows, movies).⁶ The study found that violent pain and injuries were frequently portrayed in shows targeting young children, with low levels of helping and empathy from observing characters. When observing characters did respond, they seldom displayed prosocial or adaptive behaviors toward the pain sufferer. Gender stereotypes were prevalent: boy characters experienced more pain instances than girl characters, yet observers were more responsive and concerned when girl characters were in pain. Overall, the pain was not depicted in a way that could foster the learning of *adaptive* pain behaviors or empathic responses in children who engaged with these media. Despite recommendations for parents/caregivers to supervise children's media consumption, this is not always the case, and children are often left to watch these media alone. This means that children will likely interpret and make meaning of the messages that are portrayed in these media, either independently or amongst their peers/siblings.

Young children are regularly exposed to children's picture books both at home and in educational settings,^{7,8} although exposure varies with a number of factors including parental education.^{9,10} Picture books provide an opportunity for children to develop language, communication, and social and emotional skills, and expose them to a broad variety of educational content. Shared reading of picture books (ie, the reading of picture books with children and a parent/caregiver/educator) is a powerful learning context as it provides an opportunity for discussion and interactions between the child and the reader,¹¹ to make meaning of the narrative. Through this interaction, learnings can be reinforced through "in the moment" discussion and prior experiences revisited, allowing new learnings to translate into future experiences.¹²

Shared reading of picture books has been shown to promote learning about health-related aspects of childhood and children's development, particularly relating to children's psychological and emotional health.¹³ Some of this work is in the area of bibliotherapy, an approach that utilizes books for therapeutic purposes.¹⁴ However, shared reading of picture books, which is exceedingly common during this

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developmental period, may also provide a social learning opportunity for children to learn about pain and injury. When carers and young children read books that include depictions of pain or injury, it is not clear whether and how they interact with this content. Therefore, we aimed to investigate whether, during the shared reading of picture books, depictions of pain and/or injury prompt interactions between the child, parent, and/or book. Furthermore, if interactions were identified, we qualitatively explored the characteristics of those interactions. This could include how a child or parent/caregiver reacts to characters who are depicted as experiencing pain/injury (eg, responding with sympathy) or how parent/caregiver-child interactions might differ according to differences in how pain/injury was depicted by the author/illustrator (eg, light-hearted or amusing tone vs educational and nonfiction content).

Methods

This was a qualitative descriptive study. The reporting of this study adheres to the recommendations set out in the Standards for Reporting Qualitative Research.¹⁵ This study received ethical approval from the University of South Australia's Human Research Ethics Committee (ID: 204611). The protocol of this study was lodged and locked on the Open Science Framework prior to data collection (osf.io/9unp7/).

Participants

Twenty parent/caregiver-child families (target child age: 3–6 years) from public libraries across South Australia, participated. Participants were eligible for inclusion if they were parent or caregiver of a child between the ages of 3 and 6 years. Participants who were not proficient in English were invited to participate, however, they needed to understand enough English to provide informed consent. Participants (readers) who spoke another language at home had the option of translating the contents into their language of preference as they read or could choose to speak about the pictures in the book if they were unable to read the book text. These criteria remained broad to allow diverse and varied families to be recruited and aligned with pragmatic study considerations, such as time constraints and resources available.¹⁶ The child age range (3–6 years) was chosen as it is a critical period of rapid cognitive, socio-emotional development,¹⁷ and where parents/caregivers are the primary socialisers. It is also an age where children and parents/caregivers engage in shared reading, as the children are not yet at an age where they can read fluently themselves. Participants were recruited during weekly library-hosted public engagement sessions (eg, "Storytimes") that were run for children aged 3 to 6 years. The primary researcher (S.B.W) provided information about the study to all attendees during the group session. Families who were interested in the study were given the opportunity to follow up with the researcher either during or after the session, where they could ask further

Table 1. Picture Books Selected for Shared Reading

<i>PICTURE BOOK TITLE</i>	<i>AUTHOR</i>	<i>PUBLISHER</i>	<i>FICTION/NONFICTION</i>
Spot loves his mum	Eric Hill	Penguin	Fiction
Zog	Julia Donaldson	Scholastic	Fiction
The runaway pea	Kjartan Poskitt	Simon & Schuster	Fiction
The cow tripped over the moon	Tony Wilson	Scholastic	Fiction
Oof makes an ouch	Duncan Beedie	Bonnier	Fiction
Mister Bud wears the cone	Carter Goodrich	Simon & Schuster	Fiction
Nope never not for me	Samantha Cotterill	Dial	Fiction
You wouldn't want to live without pain!	Fiona MacDonald	Salariya Book Company	Nonfiction

questions or express their interest in participating. If participants had older and/or younger siblings with them, they were also invited to participate. In this instance, the parent/caregiver would read the chosen book(s) to all children at the same time. Participants (parent/caregiver) provided written informed consent for themselves and their child[ren] prior to participating in the study.

Picture Books

Eight picture books with depictions of pain and/or injury were identified by searching the children's section at public libraries in Adelaide, South Australia. Picture books were chosen with varying amounts of pain- and/or injury-related content in the narrative (ie, pictures/illustrations and written text). The chosen books are listed in [Table 1](#). All picture books were fiction except for "You wouldn't want to live without pain!" which was nonfiction. One nonfiction book was included so that if participants preferred to read a nonfiction book, there was one available. The fiction books were not specifically about pain, nor was the primary message of the books related to pain, illness, injury, or recovery. Most books were fiction, reflecting the nature of picture books available to children in South Australian public libraries.

Most pain/injury representations in the picture books depicted minor pain/injury (eg, sore toe, cut/graze), with some depicting more significant pain/injury (eg, burns). Some depictions included both pain and injury, others depicted only pain or only injury, and in some instances, it was unclear whether pain accompanied injury. Most pain/injury depictions were within a social context (ie, other characters were present), demonstrated modulation of the pain experience, were paired with expressions of sadness from the pain/injury sufferer, and demonstrated that there can be an emotional component of pain. See [Supplementary File 1](#) for a short summary of each book and [Supplementary File 2](#) for a detailed content analysis of pain/injury representations in each book.

Procedure

Parent/caregiver-child families attended their local library for one session of 20 to 40 minutes. Participants were informed that the study aims were to better understand the conversations that occur during shared

reading with young children. To ensure interactions occurred organically, we considered it important to avoid prompting participants to talk about pain/injury. For this reason, we did not initially divulge the aims of the study.

Participants were directed to a quiet room within the public library to complete the book reading. Parents/caregivers then completed a short questionnaire about themselves (age, gender, socioeconomic status) and their relationship to the child[ren] in the study. Parents/caregivers and children were then asked to choose 2 or more picture books, from the pool of 8 books, that they would be happy to read together. Participants were told that they could read as many or as few books as they wished. Parents/caregivers and their child[ren] were video recorded (from behind) reading each of the books. Video recording was taken from behind participants so that verbal and nonverbal interactions could be captured within the context of the book (eg, pointing at features within the book). On completion of the book reading, participants were made aware of the undisclosed pain/injury-related aims of the study. At this time, parents/caregivers were asked to complete a second questionnaire that assessed characteristics of the child[ren] that took part in the book reading (age, gender), typical book-reading behaviors (frequency of shared reading, whether they would normally talk about themes/events within book narratives during shared reading), and questions relating to pain and injury (their understanding of pain, whether they found the books to be useful in enabling discussions about pain and injury). This information was gathered to contextualize the usual reading behavior of this group within the literature and to provide a context for the perspectives of the parents'/caregivers' understanding of pain.

Data Analysis

Descriptive analyses (mean and standard deviation, frequency) were used to report the demographic characteristics of the study sample. Questionnaire data with text responses were analyzed descriptively.

We analyzed the written text and pictures/illustrations in all 8 books, identifying the potential pain and/or injury affordances for parent/caregiver-child interactions (see [Supplementary File 2](#)). Specifically, we identified components of the text and/or illustration that may prompt a parent/caregiver and/or child to

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interact in a way that relates to pain or injury content. Analysis of text and pictures/illustrations was conducted, in recognition of the importance of both text and pictures in the development of literary elements in children's literature.^{18,19}

Video and audio data of participants taking part in shared reading were downloaded from the recording device. Verbal data were transcribed verbatim. Descriptions of nonverbal interactions and tone of voice were added to the transcriptions descriptively (eg, pointing to illustrations). Where participants recited the exact book text, the text was highlighted in blue, such that there was a clear distinction between the text that was recited by participants and text that reflected additional dialog. Transcriptions were analyzed alongside picture book analyses and video recordings using reflexive thematic analysis as described by Braun and Clarke.²⁰ The frequency of shared reading interactions was recorded (per book and per family), as well as the proportion of all interactions that were prompted by depictions of pain and injury. We defined an "interaction" as an engagement between the parent/caregiver and child[ren] and the narrative, text, and/or illustrations to provide meaning and context.

We adopted a reflexive thematic analysis approach to analyze qualitative data because it offered the flexibility of an inductive approach, whereby codes were developed over time using iterative familiarization with the data; no preset assumptions were followed. The reflexive thematic analysis also allowed both semantic and latent meanings from within parent/caregiver-child interactions to be captured within the analysis. Familiarization involved viewing video data, re-reading picture books, and carefully reviewing transcriptions. Codes were initially developed and revised using the NVivo software (QSR International Pty Ltd [2020], Burlington, MA). Codes were examined, and patterns of meaning were identified to generate, develop, and refine initial themes. This was done manually, using a paper-based approach, and using Excel (Microsoft Excel for Microsoft 365 MSO—version 2302, Microsoft Corporation Redmond, Washington). At times, original codes were reviewed and further revised, and initial themes were reviewed against the original data and the study's research aims. Upon broader review, themes were restructured to sit under one main "theme," because the overarching concept of book reading providing children with an opportunity to learn about pain and injury was dispersed across each of the subthemes. This main theme was broadened and then refined as we felt that it was more than simply "learning" it instead captured differences in how pain and injury may be socialized through shared picture book reading. This restructure led to further review and refinement of each of the subthemes. This recursive process of theme development and refinement was conducted in consultation with the broader research team. Concepts of data saturation are redundant and incompatible with this analysis approach (see¹⁶) and have, therefore, not been addressed in our analyses.

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Quality in Qualitative Research

Several strategies were implemented to ensure representative and high-quality data and rigorous analysis.²¹ To enhance transferability, we intentionally recruited from across 7 different libraries in South Australia (6 metropolitan and 1 rural). We sought a diverse representation of mothers, fathers, and other caregivers, and included a range of boys and girls. We have provided sociodemographic characteristics of our participants to ensure transparency of our study sample. The data analysis process underwent several credibility checks, with S.N. and A.J. reviewing analyses at multiple time points. Transcriptions were performed externally and reviewed by S.B.W. To ensure the results are credible and grounded in the data, quotations have been used throughout the presentation of the analyses. Care was taken to provide a selection of quotations across the sample, and to ensure that multiple participants and books were selected for the presentation of the analysis, or that they were representative of the data (ie, some books were more frequently chosen than others).

The main analysis was conducted by S.B.W., and the researcher's subjectivity and interpretation through which the analysis took place was acknowledged and embraced.^{22,23} S.B.W. is a White, married, middle-class, educated (physiotherapist with a PhD in pain science) woman with 2 young children (aged 4 and 7 years) and has current personal experience in reading picture books in the context presented in this study. She is a member of a research group that focuses on the role of the brain and mind in chronic pain. S.B.W. brought her perspectives into the interpretation and analysis; we recognize the resulting lack of diversity of different cultural community approaches to storytelling and shared reading practices, and that the range of possible perspectives or approaches to shared reading is vast.²⁴⁻²⁷ A reflexive journal was utilized throughout the analysis to capture S.B.W.'s reflections as well as to facilitate reflection of the overall progression and review of the analysis.

Results

Participants

Twenty parent/caregiver-child families participated. There were 8 men and 12 women caregivers, which included a broad representation of mothers, fathers, grandfathers, grandmothers, and a great aunt. The mean and standard deviation (SD) age of caregivers was 45.9 (13.6) years (range 30–69 years). Across the 20 families, there were 27 children, including 17 girls and 10 boys. The mean (SD) age of children was 3.9 (1.3) years (range 2–7 years). One family completed the reading in Afrikaans, which was translated into English for analysis. All other readings were in English. Most parents/caregivers were well-educated and financially comfortable. See [Table 2](#) for participant demographics.

Table 2. Participant Demographics

CAREGIVER (N = 20)	N (%)
Gender identity	
Man	8 (40%)
Woman	12 (60%)
Nonbinary	0
Transgender man	0
Transgender woman	0
Prefer not to say	0
Age (mean [SD]) years	45.9 (13.6); range 30 to 69
Highest education	
Higher degree (Masters/PhD)	11 (55%)
University degree	8 (40%)
Secondary school	1 (5%)
Financial situation	
Living comfortably	14 (70%)
Getting by	5 (25%)
Finding it difficult	0
Unsure/prefer not to say	1 (5%)
Relationship to child[ren]	
Mother	7 (35%)
Father	7 (35%)
Grandmother	4 (20%)
Grandfather	1 (5%)
Great aunt	1 (5%)
Child (n = 27)	
Gender	
Boy	10
Girl	17
Age (mean [SD]) years	3.9 (1.3); range 2 to 7

Picture Books and Typical Reading Behavior of Families

Overall, 48 books were read, with parent/caregiver-child families reading 2 to 3 books each. The most commonly read books were "Spot loves his mum" and "Zog" (both fiction), which were each read 11 times. The least-read book was "You wouldn't want to live without pain" (the only nonfiction book), which was chosen once and was not read. This book was initially chosen by a child, however after opening the book, the caregiver decided they did not want to read it and chose a different book. Table 3 shows reading behaviors reported by parents/caregivers. Overall, there were 587 parent/caregiver-child interactions during shared reading, of which 112 (19%) were prompted by depictions of pain and/or injury. Mean (\pm SD) number of interactions per family was 29.35 (\pm 10.74; range 9–54 interactions) and mean (\pm SD) number (and percentage) of interactions prompted by depictions of pain and/or injury was 5.6 (18.5%) (\pm 3.3 [7.3%]; range 1–13 [4.8–30.3%]). See Supplementary File 2 for details regarding pain/injury depictions in each book and interactions associated with these depictions.

Participants' Understanding of Pain

When parents/caregivers were asked "What do you think pain is?", the majority (55%) referred to pain being a physical and/or emotional injury, stressor, or

Table 3. Book Reading Characteristics

	N (% ROUNDED)
Books read (book reference code) (n = 48)	
Spot loves his mum (A)	11 (22.9%)
Zog (B)	11 (22.9%)
The runaway pea (C)	9 (18.7%)
The cow tripped over the moon (D)	8 (16.7%)
Oof makes an ouch (E)	5 (10.4%)
Mister Bud wears the cone (F)	2 (4.2%)
Nope never not for me (G)	2 (4.2%)
You wouldn't want to live without pain (F)	0 (chosen by child but withdrawn by caregiver)
Usual shared reading frequency (by caregiver)	
Rarely	0
1 to 2 times per week	3 (15%)
3 to 4 times per week	2 (10%)
5 to 6 times per week	1 (5%)
Daily	14 (70%)
Typically talk/interact during shared reading	
Always	9 (45%)
Sometimes	9 (45%)
Occasionally	2 (10%)
Rarely/Never	0

experience; 20% referred specifically to pain being associated with a physical injury; 10% referred to pain as being an experience that was interpreted by the brain; 10% simply stated that pain was "uncomfortable" and 5% did not respond. Thirty-five percent of parents/caregivers indicated that the books read were "very useful" in enabling a discussion with their child about pain and injury, 60% indicated it was "somewhat useful," and 5% said that it was "not useful."

Reflexive Thematic Analysis

Thematic analysis of parent/caregiver-child interactions during shared picture book reading generated 1 main theme with 3 subthemes (see Fig 1).

The main theme is titled: "Shared picture book reading as an opportunity for children to become socialized about pain and injury through character experiences." The essence of this theme captures the concept that one's beliefs and behaviors about pain and injury are highly socialized. That is, one's understanding of, and actions associated with pain and injury are learned early across various social contexts. Here, we consider shared reading to be an "opportunity" for socialization of pain and injury because, while there was potential for interactions and reflections about pain and injury to occur, this opportunity was not always harnessed. In these cases, we consider this to be a "missed opportunity." The potential for socialization around pain and injury was dependent on the character experiences that were depicted within each picture book. It was these depictions and affordances within each book that formed the leverage for the interactions

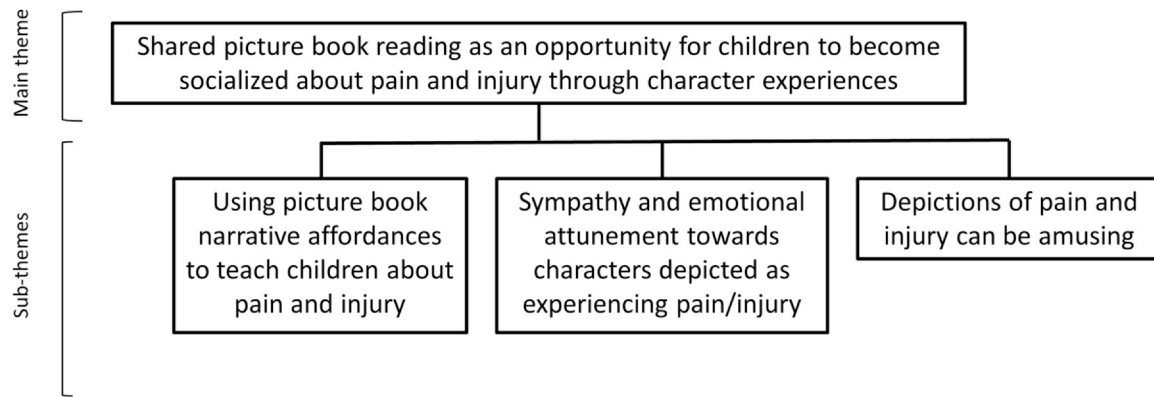


Figure 1. Reflexive thematic analysis structure includes 1 main theme and 3 subthemes.

that took place. The main theme consists of the following 3 subthemes: 1) *"Using picture book narrative affordances to teach children about pain and injury"* 2) *"Sympathy and emotional attunement towards characters depicted as experiencing pain/injury"* 3) *"Depictions of pain and injury can be amusing."* The 3 subthemes are discussed below.

Using Picture Book Narrative Affordances to Teach Children About Pain and Injury

This subtheme captures the idea that the book narrative, including the text and/or illustrations, can be leveraged to teach children educational content about pain and injury. That is, the experiences of fictional characters can be harnessed to mobilize beliefs and behaviors surrounding pain and injury.

In response to characters' pain/injury experiences, caregivers often linked an action, event, or cause to characters' pain/injury. For example, in the book "Zog," Zog had been practising his roaring and then his throat grew "hoarse." A parent/caregiver said "He's got a sore throat because he's been going, "Roar!" (Participant 6 [P6], book reference code B [B]). The parent/caregiver made the connection between Zog's repeated roaring as a cause for his sore ("hoarse") throat. This may provide the message to children that pain (ie, sore throat) is associated with a tissue-based cause (ie, irritation to the throat caused by roaring). In another example from "Zog," Princess Pearl puts a bandage on Zog's head after he flies into a tree, and a child said "They put a bandage on his head" to which the parent/caregiver responded, "Whoopsie daisy, because [the dragons are] still learning, aren't they?" (P9, B). Here, the parent/caregiver linked Zog's injury with being a "learner," implying that when we are learning, we are more likely to make mistakes, and as such, we are more likely to injure ourselves. Through raising this idea, the parent/caregiver is normalizing pain, removing "fault" or blame, and is helping the child relate to the narrative; recognizing that, like Zog, children also hurt themselves when they are learning (eg, learning to walk). This idea was further highlighted in an interaction during reading "Spot loves his mum," where Spot's mum puts a band-aid on Spot's knee, prompting a parent/caregiver

to ask the child, "Where have you had Band-Aids on before? Just about everywhere, haven't you?" (P6, A). Here they are suggesting that, like Spot, the child has had multiple similar injuries in the past. Overall, there was a social narrative that there is a tissue-based cause for pain and that children are vulnerable to injury because they are learning.

Pain and injury were often linked, or even used interchangeably by the caregiver, with the suggestion that if a character has an injury, they must have pain. For example, in the book "Zog," Zog breathed fire onto his wing and a parent/caregiver said "Oh! He's set his wing alight. That would be sore" (P6, B). Here the caregiver has assumed that Zog would be in pain ("sore") because his wing was on fire. In an example from "The cow tripped over the moon," when the cow tripped and landed on her face, a caregiver said "She [cow] landed on her face. That would hurt" (P3, D). Here, the caregiver extrapolated that a certain action (with potential injury) would be painful. While each of the characters in these 2 examples may (or may not) have been depicted as being in pain, in both cases, there was not a narrative directly addressing these assumptions, other than an illustration of The Cow and Zog showing signs of sadness (eyes furrowed, ears back, corner of mouth turned down). While it is possible that the authors of these books were expecting this assumption to be made, the depicted consequences of these injuries did not directly support this. In the case of "Zog," the princess put a bandage on his wing, and Zog flew off—so the injury and ability to function was addressed, but not pain directly. In the case of the "The cow tripped over the moon" the next page shows the cow attempting another moon jump with seemingly no functional consequences of the potential injury on the previous page. It appears that there may be an inherent assumption that injury equals pain, even if there is no direct evidence of pain being experienced. This assumption underlies the broader social narrative that pain and injury are not isolated phenomena but instead go hand in hand.²⁸

Some parents/caregivers and children discussed what they could do to help a character who was depicted as having pain/injury to make them feel better, or to recover sooner. This was often prompted by the parent/caregiver. For example, in the book "Zog," Princess

Pearl gave Zog a peppermint [sweet] to suck after Zog had a "hoarse" throat. Here, a parent/caregiver asked: "Will sucking on a lolly [a sweet] help your throat feel better?" (P9, B), prompting the child to think about how they would respond in that situation. Referring to a child's real-world experiences was a strategy that parents/caregivers used to help children relate to the events in the narrative. In the book "Spot loves his mum," Spot's mum is applying a band-aid to Spot's knee, where it might be assumed that Spot has hurt or grazed his knee. This type of injury is common for young children, and parents/caregivers often use this familiar context to help the child relate to the narrative:

Parent/caregiver: "What's [mum dog] doing to help [Spot, the child dog] feel better?"

Child: "Um, a Band-Aid."

Parent/caregiver: "Yes, and what's that?"

Child: "with cream"

Parent/caregiver: "With cream yeah. And a first-aid kit, you've got a first-aid kit don't you? With a doctor's outfit. And also maybe she gave Spot his teddy bear. How does teddy bear make you feel?"

Child: "Happy" (P4, A).

In this example, the parent/caregiver has related to the narrative to prompt the child to think about how an injured knee might be managed. The caregiver not only addresses the physical injury but also addresses the emotional component of Spot's experience (a teddy bear to make Spot feel happier). In this way, the parent/caregiver is also validating what Spot may be feeling. Connecting to the narrative and character experiences through their own real-world experiences may help make these pain/injury events more relatable and meaningful for children and may help to translate pain/injury management learnings from fictional storybook contexts into their own real-life pain/injury experiences.

Identifying who might be able to help manage pain/injury was also raised, for example, the idea that the role of doctors and nurses is to help people get better. In "Zog," Princess Pearl helps Zog when he crashes into a tree and a parent/caregiver refers to Princess Pearl saying "She's being a nurse like mummy, putting bandages on things" (P18, B). After reading the same book ("Zog"), another parent/caregiver reflects on the events of the story and says "What we need is more doctors for helping" (P9, B), reinforcing the idea that doctors are good because they help people, and therefore we need more of them. The role of mothers in helping their children was also raised. In "Spot loves his mum," when Spot's mum was seen putting a band-aid on Spot's knee, a parent/caregiver said "That's what we did last night, didn't we? We gave you a Band-Aid... All mummies do the same. They want you to get better." (P2, A). Overall, this conveys the message to children that there are

multiple people who can help when in pain/injury. It also builds expectations that care and empathy will be felt and received and highlights potential social figures who might fulfill this role.

The concept of self-management was also discussed. In "Oof makes an ouch," Oof dropped a large stone on her foot, and a parent/caregiver and child both respond:

Parent/caregiver: "Do you think [the girl has] broken her foot?"

Child: "Hmmm"

Parent/caregiver: "She's feeling a bit sad, she's rubbing it"

Child: "yeah, I think make it fix" (P17, E).

In this case, the child responded to the parent/caregiver indicating that Oof was rubbing her foot (that the stone had fallen on) as a way of "fixing" it and also conveys the child's understanding that pain can have an emotional component. Overall, shared reading provided an opportunity to socialize children about pain and injury management strategies, that there are people who can help to make pain and injury better, and that pain/injury can be self-managed.

Sympathy and Emotional Attunement Toward Characters Depicted as Experiencing Pain/Injury

A common parent/caregiver response to pain or injury was a short expression of sympathy such as "Oh no!" [P1, B], "is poor [bottom]" [P10, C], "Oh poor Spot" (P13, A). While sympathy was a common response, on occasions where the tone of the book was more playful (eg, "The cow tripped over the moon," "The runaway pea"), this sympathetic verbal response (eg, "Oh no!") was coupled with an expression of amusement (eg, laugh, giggle). In a way, this came across as sympathy that was not genuine. That is, while there was a verbal display of sympathy in recognizing that someone may have been hurt or injured, the display of amusement that was coupled with this suggests that there was no genuine care or concern in their response. Therefore, depending on the tone of the book, sympathetic responses to pain and injury were either "genuine," or "non-genuine."

Parents/caregivers used pain/injury depictions to prompt empathy for pain in the children. Various examples include: in "The runaway pea," the pea's bottom is on fire, and a parent/caregiver says "That would have been so painful, wouldn't it?" (P7C); in "The cow tripped over the moon," the cow jumped over the sun and is shown to have sustained a burn, and a parent/caregiver and child both respond with "Do you think he's sore?" "Yeah" "I think he might be" (P18, D); and in "Zog," Zog flies into a tree and a parent/caregiver says "That would hurt. Would that not hurt?" (P6 B). In each example, the parent/caregiver has prompted the child to think about how painful, sore, or hurt the character might be. While this may be done to promote empathy for those

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characters, this may also be socializing expectancies for certain experiences to be linked with pain, which could be generalized into their own lives.

Parents/caregivers also used pain/injury depictions as an opportunity to promote learning of pain-related emotions or to help children identify cues that might help to interpret others' pain-related emotions. For example, in "The cow tripped over the moon," after the cow had been burned by the sun, there is a page with no words, but the cow appears sad (and has smoke coming off her) and is supported/cuddled by her friends. Here a parent/caregiver prompted, "How do you think the cow's feeling?" and the child responded with "Sad" (P1, D). Here, the child has been prompted to use the cues within the illustration to interpret the cow's emotions. In some instances, children engaged in a behavioral response indicating a desire for emotional comfort. For example, in "Oof makes an ouch," Oof drops a large stone on her foot and the parent/caregiver read the text: "It really hurt. But she couldn't express how much" (P17, E). In response to this, the child snuggled into the side of her mother, as though looking for comfort and reassurance. This supports the idea that children can show signs of empathy toward characters' painful experiences, and this is expressed through their real-world behaviors.

Depictions of Pain and Injury Can be Amusing

Parents/caregivers and children often demonstrated that they were amused by pain/injury depictions. These responses were most often initiated by the parent/caregiver and were dependent on the book and whether the affordance of humor was present. That is, if the tone of the events within the picture book narrative was playful or light-hearted, and the character events associated with pain/injury were portrayed in a highly unrealistic way, caregivers and children would, at times, respond in a way that demonstrated they were amused by a character's misfortune. For example, in "The cow tripped over the moon," when the cow sustained a burn, one caregiver exclaimed "Oh! There's burn marks." [laughs] (P15, D). Laughing was a common way of showing amusement. In "Oof makes an ouch" when Oof makes up a new word "ouch," all the other villagers want to try it out. The villagers are then shown (in illustrations) to be inflicting injuries on themselves, in a way that was depicted to be intentionally comedic (eg, using prickles to hurt themselves). A parent/caregiver pointed to these characters who are intentionally hurting themselves and saying "Ouch!", and the child giggles in amusement (P8, E). It is likely that parent/caregiver responses of amusement to pain/injury depictions in books may contribute to children's socialization around pain and injury being somehow funny and entertaining.

Conclusions

In this study, we investigated whether depictions of pain/injury in picture books prompt an interaction

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between the parent/caregiver and the child during shared reading, and if so, we qualitatively explored the characteristics of that interaction. We found that some pain/injury depictions did indeed prompt parent/caregiver-child interactions and that these interactions became opportunities to socialize children about pain and injury. Shared reading of picture books between parents/caregivers and children may be a powerful opportunity that can be harnessed by parents/caregivers to promote children's learning of adaptive pain-related concepts and behaviors during a critical developmental period.

Parents/caregivers used character experiences to teach children about pain and injury during shared picture book reading. While several of these messages were aligned with recent expert recommendations about how to manage pain and injury,²⁹ such as minor injuries, some messages were not. For example, pain and injury were often used interchangeably, or there was an inference that if a character had an injury they must also be in pain. Interchanging pain and injury may be derived from broader social constructs about how pain works,²⁸ but it is in direct conflict with current scientific understanding of pain³⁰; that tissue damage or pathology is not sufficient for pain has long been known.^{31,32} While some biological underpinnings of "how pain works" may be too complex and nuanced for young children,^{33,34} many of the basic concepts (eg, pain is not a direct marker of tissue damage, pain depends on context) can be communicated, and contextualized in a way that children can relate to (see²⁹). This relates to Vygotsky's zone of proximal development,³⁵ which postulates that children's learning and development can be enhanced through guidance and scaffolding from a more experienced individual (eg, parent/caregiver/educator). Shared reading of picture books is the ideal context to promote more complex concepts around pain due to its didactic nature. This is in contrast to other socialization tools, such as children's television and movies, where children are often watching on their own and become passive recipients of information.³⁶ The idea that children frequently hurt themselves because they are learning was also raised, perhaps normalizing the high frequency of minor injuries in young children.¹ Shared reading of picture books could be harnessed to teach children modern concepts around "how pain works," although educating parents/caregivers on these broader social narratives will be integral to shifting these deep-seeded beliefs and biases.³⁷

Parents/caregivers often used character pain and injury experiences to talk to their children about how pain and injury could be managed. This included what could be done to address an injury (eg, band-aid for a grazed knee) as well as the emotional response (eg, providing comfort with a teddy bear). Such discussion of both the sensory and affective components of pain may promote a child's socialization to pain as a unified and multi-dimensional experience.³⁸ Interestingly, previous work has shown that parents do not often talk to children about past pain experiences due to a number of beliefs

(eg, find it to be developmentally inappropriate).³⁹ While some caregiver-child conversations about managing pain/injury may occur during a painful experience (eg, when a child grazes their knee),²⁹ shared reading may provide a unique and less threatening context to have these conversations that may not otherwise occur. The idea that doctors and nurses are there to help when we are injured or in pain was also highlighted, as was the promotion of self-management strategies, such as applying pressure to or putting a band-aid on an injury. The latter is aligned with recent work, in which experts agreed it is important to promote active coping strategies for children and adolescents to reduce their pain and/or attend to their injury.^{29,40} Fostering active management of one's pain and injuries from childhood, may help embed a more "active" approach to caring for one's health, which may promote better outcomes. For example, "active" self-management strategies for people with chronic pain appear to be associated with better outcomes than "passive" strategies.^{41,42} Self-management of chronic illnesses more broadly is associated with better quality of life, disability, symptom management, overall coping, and health care utilization.⁴³ Perhaps, then, normalizing and fostering active self-management and self-coping early in life, through the use of picture books, could have benefits that extend beyond pain, and into improved health outcomes more broadly.

Parent-child interactions about pain have been shown to influence children's current and future pain experiences. For example, interviews with children from 3 to 12 years old demonstrated that their reported pain experiences correlated to those of their parents, suggesting that parents act as role models that can influence their children's pain experiences.³⁴ Experimental research has also shown that mothers' responses to their daughter's pain (via hand cold-water immersion) can influence the reported intensity of their daughter's pain in that task.⁴⁴ Furthermore, parent responses during children's painful medical procedures (eg, vaccine injections) influence children's pain and distress during those procedures.^{45,46} In the current study, during the shared reading of picture books, pain and injury were often discussed within the family, and parents/caregivers often prompted children to further connect to the narrative by reflecting on the children's own personal experiences. Relevant here is work that showed that the way parents and their children talk about previous painful experiences can influence how children remember the pain of those experiences,^{47,48} and children's memories of pain have been found to be a powerful predictor of future pain reports.⁴⁹ This raises the possibility that these shared reading interactions may play a critical role in not only socializing children to pain and injury but also shaping children's future pain experiences.

During shared reading, parents/caregivers responded to characters' pain and injury experiences with sympathy and prompted their children to empathize with characters depicted to be in pain. Children's literature and shared reading are often used to promote

children's emotional development, such as emotional labeling and empathy,⁵⁰ because the early years of life (3–6 years) are a critical period for social, emotional, and cognitive development. Our findings suggest that shared reading of picture books with pain/injury-related content also provides an opportunity for children to learn about and explore pain-related emotions and empathy for others in pain. Around the age of 4, children develop a Theory of Mind, which is the ability to attribute mental states to others and oneself (eg, intentions, beliefs, feelings).⁵¹ Development of Theory of Mind is required for empathy, and empathy for emotions such as sadness appears to develop earlier than empathy for pain⁵²; suggesting the developmental requirement for empathy for pain and other emotions (ie, sadness) differ. Research has found that when parent-child dyads reminisce about past experiences involving *pain*, versus experiences involving *sadness*, they are less likely to talk about the emotions involved in those experiences.⁵³ In this study, however, parents/caregivers not only promoted empathy for pain in their children but also used pain/injury experiences to explore pain-related emotions. Shared reading may therefore provide a unique opportunity for children to learn and explore pain-related emotion identification and labeling through character experiences.

In picture books that depicted pain/injury in a way that was light-hearted, unrealistic, or amusing, parents/caregivers and children often responded in a way that demonstrated they were entertained by the characters' misfortune. This is similar to previous work investigating parents' beliefs and attitudes to the portrayal of pain in children's popular media.^{6,36} In that work, some parents believed that the representation of pain in media served to either entertain children or could provide valuable lessons about appropriate emotional and empathic reactions to people with pain.³⁶ Importantly, parents reported that pain was entertaining or amusing only if the pain was portrayed to be comedic, unrealistic, and exaggerated, such that it was not relatable to real-life experiences. Similarly, in our study, parents responded with amusement when pain/injury was depicted in a light-hearted, humorous, or unrealistic way (eg, Pea's bottom on fire). This suggests that pain portrayals in picture books and children's popular media are often misrepresented (ie, counter to real-life pain experiences), and parents are reinforcing these inaccurate portrayals during the shared reading of picture books. People finding other people's physical violations or misfortunes humorous is not new. A narrative review on "What makes things funny?" reported that "violation appraisal," being anything that subjectively threatens another's well-being, identity, or normative belief structure, and "benign appraisal," being the subjective belief that a stimulus or situation is benign, are 2 antecedents to what distinguishes a humorous from a nonhumorous experience.⁵⁴ It is also possible, however, that harnessing character pain/injury experiences for amusement is a strategy to teach children to move past pain/injury. It is not clear if the misrepresentation of pain in popular media and during shared reading is

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helpful, harmful, neither, or either, however, there is evidence that repeated exposure to violent media (which often precedes pain/injury) can lead to desensitization and reduced empathy and prosocial behavior.⁵⁵ Further work is needed to understand the social impact of misrepresenting pain and injury as amusing and/or unrealistic.

This study had limitations. First, while attempts were made to gain participant diversity (eg, broad inclusion criteria, the inclusion of participants not proficient in English, attending a range of libraries [including rural location]), our sample included mostly highly educated and financially stable parents/caregivers. We recruited participants by attending library "Storytime" sessions and were, therefore, more likely to interact with individuals who engage with shared reading regularly, and therefore likely to be more educated and not representative of the broader population. We also did not collect participant demographic data on ethnicity or race, and this information would have provided a greater understanding of the diversity in our participant families. Future research should be mindful of obtaining more comprehensive data on participant demographics and recruiting a more diverse sample. Second, although we selected books to obtain a range of styles and stories, our data will clearly reflect those 7 books (all fiction) and cannot be considered to represent "all picture books." Third, this study was conducted in a predominantly white Western culture and does not capture several other cultural storytelling contexts, such as those related to indigenous cultures. Furthermore, it does not capture contexts or cultures in which book reading is not a part of regular life (eg, illiterate caregivers). Future research could consider other contexts by which children are socialized about pain that better capture diverse cultures and groups. Finally, participants were told that the aims of the study were to better understand the interactions that occur during shared reading and were video recorded during reading. We made this choice so as to capture data on nonverbal interactions, but it is possible that this may have influenced the extent to which participants interacted during shared reading, which may not be reflective of their typical shared reading behaviors.

There were also notable strengths. We collected data at both urban and rural libraries; we had a similar number of men-women caregivers, and a fair spread of boys and girls. While we did tell participants that we were interested in conversations that occur during shared reading, which may have prompted more parent/caregiver-child conversations, we did not disclose any pain-related aims of the study prior to participation. Therefore, we can be confident that all pain/injury-related interactions occurred naturally. We lodged and locked our full protocol prior to collecting data, which is now recommended for all pain-related research, not just clinical trials.⁵⁶

There are many directions for future work: investigating the characteristics and narratives of picture books that are more likely to prompt helpful pain/injury-related

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interactions; understand whether caregiver gender and age influence pain/injury interactions during shared reading; explore the role of sociocultural factors (eg, race, ethnicity, culture, language, socioeconomic status) on children's socialization of pain and injury through books, narratives, and other forms of storytelling; testing a range of shared reading interventions (eg, parent-child dyad, group/educational setting) that use shared reading to socialize children to various aspects of pain and injury (eg, meaning of pain, empathy for pain, pain management); assessing knowledge gain and behavior change in children in response to shared reading interventions about pain and injury. Such future work would promote the development of resources and interventional strategies that parents, caregivers, and educators can harness to socialize and teach children about pain and injury.

In conclusion, we found that shared reading of picture books that have depictions of pain and/or injury, often prompted interactions between parents/caregivers and their children. Importantly, these interactions became opportunities to socialize children about pain and injury, through character experiences. Messaging about the meaning of pain and injury was not aligned with current scientific understanding, however, interactions about how pain/injury could be managed were mostly aligned with recent expert recommendations.²⁹ Shared reading also presented an important opportunity to promote empathy for pain, as well as pain-related emotional labeling, which is lacking in popular media (television shows and movies) and in parent-child conversations about children's past painful experiences. Finally, if the pain was depicted in a humorous or unrealistic way, children were socialized to find the characters' pain experiences amusing. Overall, shared reading of picture books appears to be a potentially powerful and untapped opportunity to teach children ways of understanding pain, injury, and recovery that may improve their pain and health outcomes in later life.

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He is non-paid CEO of the non-profit Pain Revolution and an unpaid Director of PainAustralia.

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Appendix A. Supplementary Data

Supplementary data related to this article can be found at [doi:10.1016/j.jpain.2024.03.016](https://doi.org/10.1016/j.jpain.2024.03.016).

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