Children's Expression of Emotional and Cognitive Mental States in their Story Generation from Pictures

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Emotional and Cognitive Mental States in Narratives

ABSTRACT

Background: The term *mental state* can be used to describe a person's emotional or cognitive condition (i.e. feelings, thoughts, or perceptions). Narratives provide an important context for the use of mental state words, since stories in Western culture frequently describe characters' thoughts and feelings. As children develop the ability to understand other individuals' perspectives, they may be expected to produce a greater number and variety of mental state words in narrative contexts.

Purpose: Our study was designed to investigate children's use of *mental state words or expressions* in narratives. We compared the frequency and type of mental state terms used by children ages 4-9 in a narrative context. By means of such analysis, we hoped to gain insight into the ways in which the use of emotional and cognitive mental state terms develops over the course of childhood.

Methods/Procedure: Our participants were 60 randomly selected, typically developing children from the ENNI normative sample: 10 children (5 male, 5 female) from each year in the 4-9 year old age range. We documented the number of cognitive and emotional words present in each participant's transcript. Subsequently, regression analyses were used to determine whether syntax, story grammar, and/or age predict the type and quantity of mental state words or expressions that typically developing children use in narratives.

***Results*:** Only participant age was found to predict the percentage of emotional mental state terms used in children's narratives. The regression analyses did not reveal any significant predictors for the percentage of cognitive mental state terms used in a narrative context.

INTRODUCTION

The term *mental state* can be used to refer to a person's emotional or cognitive condition (e.g. feelings, thoughts, or perceptions). A variety of words are used to describe different mental states, including verbs such as "think" or "feel" and modifiers such as "sad" or "excited." This *mental state language* emerges in children's vocabularies starting around the age of two and a half years; their use of mental state terms develops over the course of the preschool years, alongside their understanding of other peoples' thoughts and feelings (Johnston, Miller, & Tallal, 2001). Previous research suggests that children use more mental state language in their spontaneous speech as they mature (Shatz et al., 1983), and that the age of acquisition for cognitive mental state terms precedes that of emotional mental state terms (Bretherton & Beeghly 1982; Shatz et al., 1983).

Mental state language can be used to describe one's own internal states, or the cognitive and emotional states of others. When used with reference to others' states, mental state words and expressions require an awareness of the thoughts, intentions, and feelings of others. This awareness is often referred to as Theory of Mind (ToM), which "enables us to explain and predict others' behavior" (Miller, 2006, p. 142). Since language and ToM both undergo considerable development in early childhood, research on ToM has searched for evidence of mental state awareness in children's language use (Miller, 2006). Considering the connection between mental state language and ToM, it is not surprising that children have been found to use more mental state language in their spontaneous speech as their ToM develops (Shatz et al., 1983). In addition, in the words of Ornaghi & Grazzani (2013), mental state language use has been found "to be a key indicator of early ToM competencies, and a

precursor of later meta-representational ability" (p. 357). On the whole, children's use of mental state language has received a substantial amount of attention from researchers because of its relationship to ToM (Miller, 2006; Ornaghi & Grazzani, 2013).

Research has focused not only on the link between mental state language and ToM, but also on the connection between general language abilities and ToM (Miller, 2006). There is almost certainly some connection between general language skills and ToM, although it is not yet clear exactly what this connection may be: as Miller (2006) points out, some studies have found that syntax, but not semantics, is a predictor of ToM performance, while others have found the reverse. For example, Astington and Jenkins (1999) found that syntax rather than semantic scores predicted theory of mind abilities (measured by performance on false-belief and appearance-reality tasks) in 3 year old children. However, in a more recent attempt to build on this study, Ruffman, Slade, Rowlandson, Rumsey, and Garnham (2003) found the opposite to be true: according to Ruffman et al. (2003), semantic scores are a better correlate of belief understanding in 3-5 year old children. Research continues to examine ToM and its relationship to language development, which includes the emerging use of mental state words and expressions.

Less research has focused on the relationship between the development of mental state language use and the development of other language skills, such as syntactic complexity. Mental state terms have been considered as a predictor of ToM performance, but not much is known about the predictors of mental state terms themselves. Since evidence suggests the existence "of complex interdependencies between language and theory of mind" (Miller, 2006, p. 147), it is hardly sufficient to consider mental state language only in terms of ToM

development. Mental state terms should also be considered as instances of language use, and thus are likely developmentally linked to other language skills. An examination of predictors of mental state language use may point to future directions for mental state language and ToM research.

In order to begin such an examination, it is necessary to identify a linguistic context in which children's mental state word use and other language-related skills can be compared. Narratives provide an important context for the use of mental state words, as story-tellers must understand how mental states can predict or explain the characters' behavior (Rumpf, Kamp-Becker, Becker, & Kauschke, 2012). Stories in Western culture frequently describe characters' thoughts and feelings. Children's picture books, in particular, frequently include internal state language (Cassidy et al., 1998). Dyer, Shatz, and Wellman (2000) found that the frequency of mental state language use within books is high for stories written for 3-4 year olds and increases in books for 5-6 year old children. As a result, children are likely exposed to a great deal of mental state language in the context of stories over the course of childhood, in the home as well as in a school setting.

Importantly, mental state language may in some cases be integral to, not merely incidental to, Western story-telling. Story Grammar, which involves "the notion of goal-directive activity," is a measure of the elements that need to be included in a story for it to be considered adequate (Schneider, Dubé, & Hayward, 2005). Characters' thoughts, plans, and emotions may be involved in the critical units of a story, such as the protagonist's response to an initiating event (Schneider, Dubé, & Hayward, 2005), so story grammar may involve references to mental states. The use of mental state language in narratives not only requires an

awareness of the internal states of others, but also an understanding that these mental states are important components of an effective narrative. Thus, story grammar skills may be a good predictor of mental state language use within a narrative context.

Other possible predictors include children's age. The use of mental state language may plausibly increase as a function of children's emotional and mental development. Similarly, increased mental state language use might be correlated with increasing complexity and proficiency of language use, regardless of age. Thus, syntactic complexity, mean length of communication unit (MLCU) and the overall length of narratives, as basic measures of linguistic complexity in a narrative context, might serve as predictors of mental state language use in narratives. The aim of the current study is to investigate whether age, sentence complexity, total number of words used, and story grammar skills serve as reliable predictors of typically developing children's mental state language use in narrative contexts throughout the early school years.

Kauschke and Klann-Delius (1997) offer a useful classification of mental state language into five subgroups, namely emotion, physiology, volition, ability and obligation, and cognition. The emotion subgroup included terms that labeled "discrete emotions like fear, sadness; expressions of emotional valuation" and "terms referring to expressive behavior, e.g. *cry"* (Kauschke & Klann-Delius, 1997, p. 179). The physiology subgroup included terms describing subjective "physical sensations and perceptions, e.g. *tired,"* and the volition subgroup encapsulated "terms for wants, wishes, needs, intentions" (Kauschke & Klann-Delius, 1997, p. 179). Ability and obligation included terms such as "*can, may, must,"* and the cognition subgroup included "terms for mental, cognitive states in a tighter sense, expressions of

knowledge, belief, remembrance, e.g. *think, know"* (Kauschke & Klann-Delius, 1997, p. 179). The examination of each of these subgroups is beyond the scope of the current study, which will focus on the development of emotional and cognitive mental state terms only. Emotional mental state words have recently been singled out in research that examines the connection between this type of mental state language and emotional understanding, a key component of ToM (Ornaghi & Grazzani, 2013). Ornaghi and Grazzani (2013) note that "terms relating to cognition and moral judgment … have been the focus" of considerable research on mental state terms and ToM in school-age children (p. 358). Because emotional and cognitive mental state terms can be conceptually distinguished, and indeed have been shown to develop along different timelines (Shatz et al., 1983; Bretherton & Beeghly, 1982), it seems appropriate to analyze these two sets of terms separately.

The current study focuses on mental state language use, but will not contribute directly to the discussion surrounding the development of ToM. To date, research is divided on whether or not mental state word use, as opposed to comprehension, predicts ToM performance in school-age children (Ornaghi & Grazzani, 2013; Grazzani & Ornaghi, 2012). Our findings will add to an understanding of how mental state language use in narratives is related to other language skills. Using the narratives produced by typically developing children ages 4-9 in response to story pictures, we determined the number of cognitive and emotional mental state words used across these age groups and identified predictors of such language use. By means of such analysis, we hoped to gain insight into the ways in which the use of emotional and cognitive mental state terms in narratives develops over the course of typically developing children's early school years. It was hypothesized that MLCU, syntactic complexity index, the total number

of words used in a story, and age would all predict the percentage of emotional and cognitive mental state words used in children's narratives. This study may have implications for predicting academic ability, understanding more about literacy development, and recommending future research on mental state language and ToM.

METHOD

Participants

The participants for the current study were drawn from the normative sample of the Edmonton Narrative Norms Instrument (ENNI; Schneider, Dubé, & Hayward, 2005). The ENNI involves the use of picture sets to elicit narratives from children. The picture sets range in three levels of complexity and have two to four animal characters depending on the level. The characters depict a variety of emotions at various parts in each story, allowing the children many opportunities to recognize and describe mental states. At the beginning of the procedure, the children are explicitly told that the examiner can not see the pictures, and are reminded that they need to tell the story really well so the examiner can understand. In the ENNI protocol, participants are never prompted or encouraged to use mental state language. Stories told by participants in the ENNI normative sample have been scored for variables including syntactic complexity index (CI), mean length of communication utterance in words (MLCU), total number of words (TNW), and story grammar (SG). The CI is a measure of sentence complexity determined by dividing the total number of dependent and independent clauses in a transcript by the number of independent clauses. MLCU is a measure of the mean number of words, rather than morphemes, and is calculated by dividing the total number of words in the transcript by the total number of included utterances. Finally, SG is scored based on units of

information that can be considered essential to a good story(Stein & Glenn, 1979): the setting, an initiating event that sets the story into action, an internal response to the event, an internal plan to deal with the event, an attempt to handle the event, the outcome of the attempt, and the characters' reactions to the end result. In the ENNI normative sample, SG scores for the story versions A1 (simple story) and A3 (complex story, with more events and characters) are included.

For the current study, a total of 60 participants were selected from the typically developing children in the ENNI normative sample. No children with a diagnosis of language impairment were included in this study. To ensure equal numbers of participants from each year in the 4-9 age range, 10 children were randomly chosen from each age group (every second participant in each year was selected). Numbers were then adjusted to ensure that 5 boys and 5 girls from each age range were included.

Procedure

Initially, the SALT (Systematic Analysis of Language Transcripts; Miller & Iglesias, 2012) program was used to generate a list of all of the words in the entire ENNI normative sample. Based on an examination of this list, a master list of emotional and cognitive mental state words was generated (see Appendix). Once the participants were selected, the SALT program was used to search their respective ENNI transcripts for the presence of words on the emotional and cognitive word lists. Participants' usage of each of the words on these lists was individually analyzed to confirm that it could be considered to be a descriptor of a character's cognitive (e.g. "think") or emotional (e.g. "feel") mental state. Many words were clearly

emotional or cognitive mental state words (e.g. “feel,” “believe,” etc.); when in doubt, we arrived at a decision about inclusion or exclusion on a word-by-word basis. To ensure that results would reflect children’s use of words that indicate someone else’s (i.e. a character’s) mental state, words that referred to the narrator’s (e.g. the child’s own) mental state were excluded. Words such as “bad” and “hurt” were included only when they referred to a character’s feelings, as opposed to a physical state (e.g. “he hurt his knee”). The term “great” was excluded when it served as an objective evaluative term (e.g. “it was a great sandcastle”). Similarly, the word “funny” was excluded when it was used to mean the objective quality of “strange.” Rote phrases such as “don’t worry” and “happily ever after” were included, because they stand as common examples of mental state language use in everyday life or narratives. The word “try” and its various forms (e.g. “tried,” “tries,” etc.) were included, since they involve an inference about a character’s intention, which is a type of cognitive state. The word “accidentally” was included for the same reason.

Once the master lists of cognitive and emotional mental state words were complete, the SALT program (Miller & Iglesias, 2012) was used to determine how often each word on the lists occurred in each participant’s transcript. Each of the 4 members of the research team examined a roughly equal portion of the transcripts, looking at the target words in context to ensure that they met inclusion criteria. The number and type of emotional and mental state words in each participant’s transcript was recorded. To ensure that mental state word counts were reliable, 20% of the transcripts were re-scored by another member of the research team, with 98% inter-rater reliability. To equate scores for length of story, the number of words in each transcript that were emotional mental state terms was divided by the total number of words in

the transcript to derive the emotional word score; the same was done with cognitive mental state terms to derive the cognitive word score.

The participants' ages and their standard scores for MLCU, CI, TNW, and SG were drawn from the ENNI normative data. Correlations among all variables were examined and variables were identified based on these correlations. Finally, multiple regression analysis was used to determine whether participant age, MLCU, CI, TNW, and/or SG predicted the percentage of emotional or cognitive mental state words used within a narrative. Separate regression analyses were generated for each of the two types of mental state terms.

RESULTS

A correlation matrix was generated to determine whether the variables of interest were significantly correlated with one another. As expected, TNW, CI, MLCU, and SG scores were all significantly correlated with one another (see table 1). In addition, participant age was found to be significantly correlated with TNW ($r = 0.369$, $p = 0.004$), CI ($r = 0.440$, $p < 0.01$), MLCU ($r = 0.451$, $p < 0.01$), and SG scores ($r = 0.674$, $p < 0.01$). Because SG scores for the A1 and A3 stories were strongly correlated ($r = 0.658$, $p < 0.01$), only A3 SG scores were used in the regression analyses.

Table 1. Correlation Matrix

	1	2	3	4	5	6	7
1. Participant Age	–						
2. TNW	0.369	–					
3. Complexity Index	0.440	0.669	–				
4. Story Grammar Scores Combined	0.674	0.584	0.467	–			
5. Story Grammar A1	0.628	0.502	0.351	0.825	–		
6. Story Grammar A3	0.621	0.556	0.468	0.968	0.658	–	
7. MLCU	0.451	0.646	0.643	0.51	0.492	0.462	–

Note: All correlation coefficients are significant at the p < 0.01 level

Emotional Mental State Words

Multiple regression analysis was used to determine whether syntax (CI), story grammar SG), story length in words (TNW), and/or age predict the type and quantity of mental state words children use in their narratives. A stepwise regression was performed with age in model 1 and the remaining variables were entered in model 2. The analysis revealed that an increase in participant age predicted an increase in the percent of total words used that were emotional state terms *(t* = 3.557, *p* = 0.001). TNW (*t* = 1.418, *p* = 0.162), CI (*t* = -1.269, *p* = 0.210), MLCU (*t* = -0.940, *p* = 0.351), and SG (*t* = -3.11, *p* = 0.757) did not predict percent of words that were emotional state terms. These results indicate that participant age is the only variable examined in the present study that is predictive of percent emotional state terms used in children's narratives.

The stepwise model was significant, adjusted *R* square = 0.187, $F_{5,54}$ = 3.719, *p* = 0.006. The only significant predictor was age. The betas for all variables in the regression analysis are shown below:

Predictor Variable	**Beta**	***p***
Participant age	0.558	*p* = 0.001
TNW	0.258	*p* = 0.162
CI	-0.220	*p* = 0.210
Story Grammar A3	-0.052	*p* = 0.757
MLCU	-0.160	*p* = 0.351

Cognitive Mental State Words

The regression analysis was used to determine the effect of these same variables on the percent of cognitive state words used in children's narratives. A stepwise regression was performed with age in model 1 and the remaining variables entered in model 2. As recommended by Pallant (2010), one variable, MLCU, was not included because it was not

correlated at .30 or higher with the percentage of cognitive words. The regression analysis did not show any significant predictors; age (t = -1.613, p = 0.112), TNW (t = -0.657, p = -0.514), CI (t = 1.963 p = 0.055), and A3 Story Grammar (t = -1.634, p = 0.108) did not significantly predict percent cognitive state terms used.

The stepwise model was not significant, adjusted R square = 0.044, $F_{3,56}$ = 1.912, p = 0.138. The betas for all variables in the regression analysis are shown below:

Predictor Variable	**Beta**	***p***
Participant age	-0.266	p = 0.112
TNW	-0.121	p = 0.514
CI	0.340	p = 0.055
Story Grammar A3	-0.253	p = 0.108

DISCUSSION

The present study's purpose was to gain insight into the ways in which the use of mental state terms develops over the course of childhood, including the early school years. Previous research has already demonstrated that, as might be expected, children's spontaneous mental state language use increases as their Theory of Mind (ToM) develops (Shatz, Wellman, & Silber, 1983). At present, however, less is known about what other developmental factors might covary with mental state word use: what specific language skills, if any, can predict children's use of this type of vocabulary? This study examined age, syntactic complexity of expressive language (measured by complexity index and mean length of communication utterance scores), total number of words, and use of typical Western narrative structures (measured by story grammar scores) as possible predictors of children's mental state term use in a narrative context. The operational definition of mental state terms was adapted from the classification system offered by Kauschke and Klann-Delius (1997), who grouped words that express internal

or mental states into the subgroups of emotion, cognition, evaluation, modality, physiology, and affective particles. For the purposes of the present study, only words that describe the emotions or cognitive state of characters within a narrative were included. These emotional or cognitive words were considered to be indicators of the participants' awareness of their characters' mental states. To ensure that any differences in the development of emotional versus cognitive mental state words would be detected, emotional and cognitive mental state words were analyzed in separate multiple regression analyses.

Before the analysis was completed, it was hypothesized that the percentage of both emotional and cognitive words used in narratives told by children aged 4-9 would gradually increase with age. This increase would coincide with cognitive and linguistic development. Regardless of whether the use of mental state words were explicitly taught to the study's subjects in school, it seems reasonable to suggest that the act of learning to read within a school setting will result in exposure to Western-style narratives. As children's narratives in Western culture frequently include information about characters' emotional and cognitive states (Cassidy et al., 1998; Dyer, Shatz & Wellman, 2000), children's use of mental state words within narratives might reasonably be expected to increase with age not only due to normal development, but also because of academic experiences.

These academic experiences would also likely interact with normal developmental processes to boost children's total number of words used per narrative (TNW), mean length of communication unit (MLCU) scores, complexity index (CI) scores, and story grammar (SG) scores. A correlation matrix (see Table 1) generated prior to the regression analysis confirmed that participant age correlated significantly (at the 0.01 level) and positively with TNW, CI,

MLCU, and SG scores. Such correlations support the common-sense hypothesis that these scores increase with age as children develop their language abilities, in part through academic instruction and experiences during the early school years. It was expected that MLCU, CI, TNW, and age would all serve as predictors of mental state word use in children's narratives.

The results of the regression analysis revealed a more complex picture of the development of typical children's mental state word use within narrative contexts. Age did, as expected, predict the percentage of emotional words in children's narratives. This outcome is in agreement with various previous research findings, summarized by Weimer, Sallquist, and Bolnick (2012), which have demonstrated that children develop emotion understanding, or the "awareness of their own and others' feelings" (p. 281), over the course of childhood. Children as young as 3 years have demonstrated an ability to judge what story characters will feel based on the characters' experiences (Yuill, 1984). The present study's results suggest that between the ages of 4 and 9, typically developing children use an increasing number of words that specifically describe characters' emotional states in the narratives that they generate.

Notably, however, none of the other variables included in the present study varied significantly with the percentage of emotional words. This finding suggests that while emotional mental state word use develops with age, it is independent of other aspects of language development, or at least of the components examined. Such findings would support the hypothesis that children's ability to understand and comment on others' emotions – an aspect of Theory of Mind that has received special, separate attention from various researchers (e.g. Thirion-Marissiaux & Nader-Grosbois, 2008; Ornaghi & Grazzani, 2013)– and their linguistic abilities develop independently, to a certain extent. The fact that story grammar scores were

not found to be significant predictors of emotional mental state word use suggests that the use of such terms is not due to increased awareness of the features of many Western narratives (many of which center on characters' feelings and emotional motivations). Percentage of emotional mental state words in children's narratives, therefore, seems more likely to be related to children's maturation than to exposure to narratives or to the language skills included in this analysis.

The participants' use of cognitive mental state terms in narrative contexts was examined in a separate multiple regression analysis. Story grammar scores were, as with emotional mental state words, not significant predictors of cognitive mental state words, which lends further strength to the conclusion that mental state word use is not necessarily related to children's understanding of typical narrative structures and features. Similarly, this study's measures of linguistic complexity and language development – namely MLCU, CI, and TNW – were not found to be significant predictors of cognitive mental state word use. Like emotional mental state word use, cognitive mental state word use in narrative contexts and children's other linguistic abilities are not necessarily closely related.

Interestingly, however, age was also not a significant predictor of cognitive mental state word use. While the 4-year-old children in the present study already used some cognitive mental state words in their narratives, older children did not use significantly greater quantities of words that specifically describe characters' cognitive states. As a result, it appears that unlike emotional mental state word use, cognitive mental state word use does not increase consistently with age. It would seem, therefore, that emotional and cognitive mental state word use should be carefully distinguished from one another in terms of children's

development. This implication of the present study is consistent with the results of previous research, which has shown that age of acquisition differs for cognitive and emotional mental state terms (Bretherton & Beeghly, 1982). Our results also support Ornaghi and Grazzani's (2013) assertion that emotional-state language "is to be differentiated from other categories of mentalistic language such as terms relating to cognition and moral judgement" (p. 358). In fact, the usefulness of the all-encompassing term "mental state word" is itself called into question; narrower definitions of word categories may prove to be advisable both for researchers and therapists.

On a related note, this study's results bear implications for our understanding of the development of children's ToM. It may be useful to describe emotional ToM and cognitive ToM separately, much as the broad term "mental state words" should be more narrowly defined. Once again, this suggestion is in agreement with Ornaghi and Grazzani's (2013) argument that "emotion understanding" should be subjected to research "as a special case of ToM" (p. 358). Theorists and researchers who, like Ornaghi and Grazzani (2013), consider the components of ToM may have greater success in understanding this concept and its relation to mental state language.

Several future directions for research and potential clinical applications present themselves based on this study's findings. First, it would be worthwhile to investigate the possibility that the materials used in the ENNI may have influenced the type of words used; the present study's results would need to be replicated with other materials to be considered definitive. Different stimuli might prompt narratives with different proportions of cognitive and emotional mental state words. For example, an alternate set of story events, or the inclusion of

conventions such as thought balloons, might elicit narratives with greater numbers of cognitive mental state words. Since none of the present study's measures predicted the use of cognitive mental state terms in ENNI-elicited narratives, future research should explore other possible predictors. Also, future studies could investigate whether cognitive mental state word use changes significantly beyond the age of 9. Building on the work of researchers such as Johnston, Miller, and Tallal (2001), who examined "the use of cognitive state predicates by children with specific language impairment" (p. 1), future research should also address the question of whether children with language impairment and other disorders use fewer or different types of mental state terms than typically developing children.

With respect to emotional mental state word use in particular, existing research suggests that general emotion comprehension skills and ToM covary (Weimer, Sallquist, & Bolnick, 2012); researchers such as Ornaghi and Grazzani (2013) treat emotion understanding as "a special case of ToM" (p. 358). Perhaps unsurprisingly, in a recent study by Weimer, Sallquist, and Bonick (2012), "children who had a better understanding of how situations might lead a person to experience various emotions were better able to understand others' thoughts and beliefs" (p. 296); the authors conclude that "children's ability to understand the causes of others' emotions . . . relates to ToM understanding" (p. 299). Arguably, the spontaneous use of emotional mental state words in a narrative context is indicative of an ability to understand the causes of others' emotions: in a narrative, characters' feelings are frequently interwoven with the plot. Thus, the present study's results provide further confirmation of the link between emotional comprehension, ToM, and emotional mental state word use, all of which demonstrably develop with age. Ornaghi and Grazzani's (2013) research findings have already

suggested that emotional mental state language use and emotional comprehension covary. Further research is necessary to investigate the possibility that emotional mental state word use can function as a reliable indicator of emotion comprehension.

If further evidence of the link between emotional mental state word use and emotion comprehension is found, a practical application of the present study's findings presents itself. As mentioned, Ornaghi and Grazzani (2013) found evidence to show that the use of emotional state language terms is correlated with emotional understanding. Given that the present study has identified age as a predictor of emotional mental state word use, it may be valuable to develop norms for emotional word use that can help identify children with delayed emotional comprehension development. Such identification could help ensure that children with emotional delays get appropriate support: as Weimer, Sallquist, and Bolnick (2012) point out, enhancing emotional comprehension skills "could improve overall social cognition, which in turn could promote children's prosocial behavior" (p. 299). Ornaghi and Grazzani (2013) agree that "promoting emotional competence in school-aged children" is of great importance to ensure that children are "emotionally equipped to meet the challenges of their social environment" (p. 364). It may well be worthwhile to consider how emotional mental state word use within a narrative context can offer insight into an important aspect of children's ToM. On the whole, the present study's findings points to a number of theoretical and practical avenues of further inquiry; the results regarding emotional state word use in narrative contexts may prove to be especially fruitful ground for future researchers.

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APPENDIX

Comprehensive List of Emotional State Words in Participants' Narratives

Admires
Admiring
Afraid
Amazed
Anger
Angry
Ashamed
Bad
Badly
Begged
Begging
Bored
Calm
Cranky
Cried
Cries
Cry
Crying
Drowsy
Dumbstruck
Embarrassed
Encouraged
Engaged
Enjoy
Excited
Favorite
Feelings
Frightened
Frowning
Funny
Furious
Glad
Goofy
Great
Greedy

Guilty
Happy
Happily
Happier
Hilarious
Hooray
Hopeless
Horrified
Hurt
Impressed
Incredible
Jealous
Laugh
Like
Love
Loved
Loves
Loving
Mad
Madder
Merry
Pleased
Please
Pleasure
Polite
Politely
Queasy
Relieved
Rested
Resting
Sad
Sadder
Sadly
Safe
Scared
Seasick
Shocked
Shy

Sleepy
Smile
Smiled
Smiles
Smiley
Smiling
Steamed
Stupid
Surprise
Surprised
Tear
Tears
Terrified
Thankful
Thrilled
Tired
Touched
Uhoh
Unhappy
Unsure
Upset
Weary
Winey
Oops
Oopsie
Oopsies
Oopsy
Whoops
Whoopsadaisy
Whoopsies
Woozy
Worried
Worry
Worrying
Worse
Yahoo
Yeek
Yay

Yeeks
Yikes
Yippee
Yuck
Yucky
Yum
Yummy

Comprehensive List of Cognitive State Words in Participants' Narratives

Accidentally
Agree
Blaming
Confused
Curious
Decide
Decided
Decides
Fault
Thought
Thoughted
Trick
Tricks
Try
Trys[1]
Tried
Tryies
Trying
Understand
Understanding
Understood
Idea
Want
Wanted
Wanting
Wants

[1] The word "trys," like the word "tryies" below it, were misspellings of the word "tries" in the ENNI transcripts. These words were included in the search to ensure that relevant instances of these cognitive words were not missed simply because of a spelling error.

Wish
Wished
Wonder
Wondered
Wondering
Wonders
Hypnotized
Ignore
Interested
Learn
Lied
Lie
Lying
Memory
Notice
Noticed
Notices
Pretend
Pretended
Pretending
Pretends
Realize
Realized
Recognize
Remember
Reminded
Reminds
Smart
Sneak
Sneaked
Snuck
Sure
Teased
Teasing
Think
Thinks
Thinked
Thinking