How Focus at Encoding

Affects Children's Source Monitoring

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Abstract

Retention of source information is enhanced by focus on speakers' feelings about statements even though recognition is reduced, for both adults (Johnson, Nolde & DeLeonardis, 1996) and children (Kovacs & Newcombe, 2006). However, does any focus on another person lead to enhanced source monitoring, or is a particular kind of focus required? Does other-focus enhance source monitoring, or self-focus detract from it? In Experiment 1, 4- and 6-year-old children watched two speakers make statements in a no-focus control, or with focus directed on how they (or a speaker) felt about the statements, or on perceptual features about themselves (or the speaker). Source-monitoring decisions were enhanced by other-focus in both the perceptual and the emotional conditions. However, the effect was larger for the emotional condition, and source monitoring exceeded no-focus controls only for this condition. Experiment 2 showed no effect of other- versus self-focus on source monitoring when questions were semantic.

Key Words: source monitoring, binding processes, encoding focus, self-other memory

How Focus at Encoding

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Source memory refers to memory for information about the circumstances under which a memory is acquired (Johnson, Hastroudi, & Lindsay, 1993; Schacter, Kaszniak, Kihlstrom, & Valdisierri, 1991). Memory for source may include a variety of details, such as perceptual information (e.g., the color of objects one saw during a specific event), temporal information (e.g., the temporal sequence of events), and emotional information (e.g., what one was feeling during the event). Source per se is not always encoded directly, as a tag or label in memory (e.g., it was Mary who said she is afraid of thunderstorms). Rather, details surrounding the event at the time of encoding are often evaluated and attributed to particular sources based on decision processes at the time of remembering (e.g., the person who said she is afraid of thunderstorms had short dark hair, or made the remark last week, or looked pale and shaky when she said it). This set of processes is known as *source monitoring* (Johnson et al., 1993).

Often, source monitoring decisions are made quite rapidly and non-deliberatively, at least if the various details encoded during the original event are bound together to form a coherent representation of the event (Henkel, Johnson, & De Leonardis, 1998; Johnson et al., 1993). Since source monitoring depends on the memory characteristics available at the time of remembering, accurate source monitoring would seem to rely fundamentally on the amount and quality of the information encoded at the time of the event. However, Johnson, Nolde and DeLeonardis (1996) found that direction of attention (i.e., inward to the self or outward to a speaker) affected recognition memory and source monitoring in opposite directions. In a set of studies, adults were asked to listen to two speakers make

various statements on audiotape (Experiment 1) and videotape (Experiment 2) that ranged in emotional intensity (e.g., "Abused children who kill their parents should not be convicted of murder" versus "Da Vinci's Mona Lisa hangs in the Louvre"). As the participants listened to the speakers, they were either asked to rate how *they felt* about what the speaker was saying (Self-focus condition) or to rate how they thought the *speaker felt* about what he or she was saying (Other-focus condition). After a short delay, participants were administered an old-new recognition test for the statements and source monitoring test for those items they had identified as old. In both experiments, participants in the Other-focus condition performed *better* on the source test but *worse* on the recognition test than the participants in the Self-focus condition.

Johnson et al. argued that focusing on how the speaker felt led the participants in the Other-focus condition to process the distinctive features of the speakers with respect to the content of the statements, thus binding the person and the statement together and improving source accuracy. On the other hand, focusing on one's own feelings leads to relating the content of the statement to one's own memories, improving recognition for content, although at the expense of processing information that would provide cues to source. In fact, in support of this analysis, they found in their Experiment 3 that a subtle change in instructions—asking participants to think about their feelings about the speaker—caused source accuracy to be at the higher levels of the standard Other-focus condition rather than at the lower levels of the standard Self-focus condition. That is, the central factor in improvements in source accuracy is some degree of focus on the speaker, even if the question also involves one's own feelings. In a similar vein, Jurica and Shimamura (1999) found that individuals who generated answers to questions about their

likes and dislikes at encoding had excellent recognition memory for the questions asked,

but performed quite poorly at discriminating who asked the question.

Kovacs and Newcombe (2006), using a paradigm similar to that of Johnson et al.

(1996), showed the same effects for children. They asked 4- and 5-year-old children to

listen to speakers make various statements about a range of topics relevant to children

(e.g., "I hate snakes", "I really like going to the library"). As the children listened to the

statements, they were either asked to indicate if *they felt* the same way about the topic as

the speaker (Self-focus) or they were asked to indicate how the *speaker felt* about the

topic (Other-focus). As with Johnson et al.'s findings with adults, children in the Self-

focus condition had *better* recognition memory for old statements but *worse* source

accuracy. For 5-year-olds, the advantage of Other-focus for source accuracy was evident

in all conditions studied. For 4-year-olds, there was an advantage only in the easiest

source-discrimination situation, when the speakers were dissimilar and were on videotape

(i.e., both seen and heard). Perceptual similarity between sources results in more source

confusion (Ferguson, Hashtroudi, & Johnson, 1992; Johnson, Raye, Foley, & Foley,

1981; Lindsay, Johnson, & Kwon, 1991). It may be that Other-focus was insufficient to

allow 4-year-old children to discriminate source in a challenging situation. Four-year-

olds are less able to bind together aspects of a situation in general (Sluzenski, Newcombe,

& Ottinger, 2004) so the other-focus may not help them when the task is too hard.

Overall, these data suggest that focusing on one's emotions promotes processing of the

statement, encouraging binding it to one's personal opinions or memories, which in turn

improves recognition. However, this type of processing seems to occur at the expense of

processing information that would provide better cues to source (e.g., features of the

speaker). On the other hand, focusing on the speaker's emotions during encoding may promote the processing of features associated with the speaker (e.g., sound of voice, emotional reaction), and in turn provide associations between the features of the speaker and the content of the statement that would allow for accurate source judgments. [Note that other approaches to recognition memory and source monitoring exist, but the similarities and differences between the source monitoring framework and other theories are beyond the scope of this paper. Readers are directed to in-depth exchanges comparing and contrasting the SMF with fuzzy-trace theory (Lindsay & Johnson, 2000; Reyna, 2000) and with threshold models (Qin, Raye, Johnson & Mitchell, 2001; Slotnick & Dodson, 2005; Yonelinas, 1999).]

The existing studies do not, however, provide information about two interesting questions. First, they do not tell us whether a difference in source accuracy between directions to focus on the self versus on the speaker would result from *any* attentional shift in the direction of focus (i.e., inward or outward). The manipulations used in research so far all involve emotion. Yet the source monitoring framework also discusses other attributes of speakers, such as their perceptual characteristics (e.g., hair color, voice pitch) as relevant to source decisions. Would asking children to focus on perceptual characteristics of the speaker also improve their source accuracy? Perhaps any attentional shift onto the speaker, regardless of the type of focus (e.g., emotional or perceptual), would improve source monitoring because other-focus encourages the encoding of particular speaker traits, which are used for later source-monitoring decisions. However, it is also possible that making an evaluative judgment about a speaker's emotions in relation to the statement establishes a stronger association between the content of the

statement and the speaker than thinking about other aspects of the speaker. For example, fear of thunderstorms could occur in someone with either dark or light hair, so thinking about hair color does not strongly bind a statement to a speaker, in the same way as speculating about why a person is afraid of thunderstorms might establish a link.

Second, the existing research does not tell us whether focusing on one's own emotions during encoding *impairs* source monitoring accuracy or whether focusing on the speakers' emotions during encoding *improves* source monitoring accuracy (or both). A no-focus control group would be required to answer this question (Mammarella & Fairfield, 2008). The purpose of the two studies in this paper was to address these two questions.

Experiment 1

The experimental technique for the source monitoring task used in the present study was similar to the one used by Kovacs and Newcombe (2006). However, in addition to the Emotional-self and Emotional-other focus conditions in the Kovacs and Newcombe (2006) study, three new encoding focus conditions were included. These were a Perceptual-self focus condition, a Perceptual-other focus condition, and a Control condition. Examination of source monitoring accuracy in the perceptual conditions relative to the emotional conditions addresses the possibility that the self-other effect resulted from any attentional shift in the direction of focus, without emotional processing being required. More specifically, if the nature of the self-other effect is due specifically to an attentional shift in the direction of focus at encoding (i.e., self or other), there should be no source monitoring differences between the two types of self-focus conditions or the two types of other-focus conditions. In addition, the inclusion of a

control group allows examination of the nature of the self-other effect: does self-focus impair source monitoring and/or does other-focus improve source monitoring?

Method

Participants

This study included 150 children. There were 75 four-year-olds (42 males and 33 females, mean age = 52.28 months, range 47 to 59 months) and 75 six-year-olds (39 males and 36 females, mean age = 75.04 months, range 70 to 83 months). The children were recruited from suburban preschools in the Philadelphia area and the majority of the children were white and middle-class. Informed consent was obtained from the parent or guardian of each child. Participants were randomly assigned to one of the encoding focus conditions.

Design and Procedures

Children were tested individually in a quiet setting at their preschool and within regular hours of the school day. Twenty one statements expressing opinions on topics relevant to children (e.g., preferences for foods or drinks, dislikes and likes of activities) were prepared (see Appendix A). Fourteen of the 21 statements were assigned to Speakers A and B (7 each). The remaining seven statements were used as new statements for the subsequent source monitoring task. The statements were assigned as to generally equate the topics and emotional level across speakers and new statements. A videotape was made in which two speakers read the statements (e.g., one speaker read list A statements and the other speaker read list B statements). A second video was made in which the set of sentences assigned to each of the two speakers was switched. The order of the statements on the tapes was random with the restriction that one speaker did not

say more than two statements before the other speaker said a statement. The same order

was used for both videos. Although the study employed similar speakers, the speakers

were perceptually distinguishable. The speakers were two adult females with highly

distinguishable perceptual qualities (e.g., shirt color, hair color, hair length, and sound of

voice).

<u>Training Phase</u>

Since the children would be asked to identify the emotions the speaker felt and the

emotions they felt regarding each statement, we wanted to ensure that the children knew

the names of the emotions and could identify the expressions associated with each

emotion. The children were shown six pictures of an adult woman depicting various

facial expressions that represented the emotions shown in the video. The children were

asked to name the emotions, and if they were unable to produce a label for a particular

emotion, the experimenter labeled the emotion and repeated the question.

Once the children recognized and could name the emotions in the photographs,

the experimenter explained to the children that they would be watching a video of two

speakers telling them different things about themselves. The children were introduced to

the speakers on the video and were subsequently asked to point to each speaker by name

in a photograph on the table to ensure that the children could differentiate the speakers.

Finally, the children were directed on what they should focus on or think about during the

video. To ensure the children understood the nature of the encoding focus and the type of

response to the encoding question, the children listened to the speakers make one

statement each. Before hearing the practice statements, the children were told what to

focus on and immediately following the presentation of the statement were asked the

encoding question. None of the children showed difficulty answering any of the practice questions or difficulty understanding what they should think about during the video.

<u>Acquisition Phase</u>

During acquisition, the encoding focus question was asked immediately following the presentation of each statement at which time a black screen appeared on the video. Children in the <u>Emotional self-focus</u> condition were asked to indicate how the statement each speaker said would make them feel (i.e., "How do you feel about that?"). Children in the <u>Emotional other-focus</u> condition were asked to indicate how the speaker felt about what she was saying (i.e., "How does she feel about that?"). To avoid explicit rehearsing of the statement, the experimenter never repeated the statement or referred to the content of the statement while asking the encoding question. Rather the content of the statement was replaced with "that." The emotion questions were open-ended. None of the children had difficulty producing an emotion label in either condition.

Children in the <u>Perceptual self-focus</u> condition were asked to respond to a perceptual question regarding themselves (e.g., "What color is your shirt?"). Children in the <u>Perceptual other-focus</u> condition were asked to respond to a perceptual question regarding the speaker (e.g., "What color is her shirt?"; "What color is her hair?").

Children in the <u>Control</u> condition were asked about the quality and sound of the video (e.g., "Is the sound loud enough for you to hear?) after every other statement. Although asking this question after every statement would seem to be more closely aligned with the other conditions, pilot work showed that children reacted to this constant questioning as if it were odd. Pilot work also showed that a control condition that involved having children listen to statements without any questions at all led to low

attention. Because the intent of the control condition was to mimic "natural attentive listening", we chose to ask the question after every other statement.

<u>Delay Phase</u>

Following the video presentation, the children were administered a separate binding task, not reported in this paper, which took approximately 15 minutes. This task required the children to look at 10 colored pictures. After a short delay the children were asked to identify which object was a particular color. At the completion of this task, the children were administered the recognition and source memory measures.

<u>Test Phase</u>

Before reading the statements and asking the test questions, the experimenter reminded the child about listening to the speakers on the video and showed the child three pictures (4 in x 6 in) that corresponded to the three response options, Dawn, Elizabeth, and no one. The "no one" picture was essentially a picture of white light, which was used to depict the idea of "no one" (see Thierry, Spence, & Memon, 2001, for a similar procedure). While pointing to the corresponding photographs, the experimenter said to the child, "Remember we listened to my friends Dawn and Elizabeth tell us different things on the video? Well, now we are going to see if you can remember the sentences that each of them said. I am going to read you sentences and I want you to tell me or show me by pointing to the picture who said the sentence. But, guess what, I am going to try to trick you and some of the sentences I read no one said on the video. So, I am going to put this picture here (holding up the nothing picture) and if no one said the sentence that I want you to say no one or point here to this picture. So, think hard if you heard the sentence on the video, so I don't trick you." To ensure the children understood

the concept of new sentences, each child was given practice questions for each type of response (e.g., "If Dawn said the sentence what would you say or where would you point?", "If Elizabeth said the sentence what would you say or where would you point?", "What if no one said the sentence, what would you say or where would you point?"). All of the children understood that the pictures represented the speakers and the idea that the picture of nothing represented "no one."

The test phase included 21 (14 old and 7 new) statements. The test statements were in an intermixed random order, with the restriction that no more than two statements from any one source were presented consecutively. In addition, the tests lists were compiled so that either the first or second sentence was a new statement to ensure the children used the new response. If a child failed to correctly identify the new item, after the third statement, the experimenter reminded the child that some of the sentences were new and no one had said them on the video. There were only a handful of children who needed to be reminded to use the new response after the first few sentences, but once reminded they varied their responses.

Scoring

Corrected recognition scores were computed by obtaining, for each child, the proportion of test items that were correct "old" responses to old items (hits), regardless of source accuracy, minus the proportion of incorrect "old" responses to new items (false alarms). Source monitoring scores were the proportion of statements correctly identified as old that were also attributed to the correct source.

Results

An alpha level of .05 was used for all statistical analyses, except where noted. For all t-tests, the p-values are two-tailed. When appropriate, Tukey HSD post-hoc tests were used. Effect sizes are reported as Pearson r. Initial analyses produced no main effects of sex or sex interactions, and thus the data were collapsed across sex.

<u>Old/New Recognition</u>

Recognition scores refer to the children's ability to discriminate "old" items (statements on the video) from "new" items (distracters), without regard for correct identification of source. While recognition memory for the statements was not the main focus of this research, we examined recognition scores to determine whether direction of focus affected memory in the same way as in previous studies, namely greater recognition memory with self-focus, and whether such an effect appeared for perceptual as well as for emotional conditions. Table 1 shows the proportion of hits, false alarms (new items mistakenly judged to be old statements), and corrected recognition scores (hits minus false alarms). Chance on this measure is 0. In each section, we consider first the effects of age, type of encoding and focus, and then move to an analysis comparing scores with the control condition. Analyses of d' scores showed the same pattern of effects as corrected recognition for both experiments; thus, only the analyses on corrected recognition are presented.

<div align="center">Insert Table 1 here</div>

<u>Corrected recognition</u>. A 2 (age) x 2 (encoding condition: emotional or perceptual) x 2 (focus: self or other) ANOVA produced significant main effects of age, $\underline{F}(1, 112) = 17.10$, $\underline{p} = .00$ and encoding condition, $\underline{F}(1,112) = 99.39$, $\underline{p} = .00$, with no main effect of focus. Four-year-olds' recognition scores ($\underline{M} = .54$) were lower than 6-

year-olds' scores ($\underline{M}$ = .68). Recognition was better with emotional ($\underline{M}$ = .79) than with perceptual questions ($\underline{M}$ = .44). Additionally, there was an encoding by focus interaction, $\underline{F}$(1,112) = 5.17, $\underline{p}$ = .03. As found previously in studies of other- and self-focus using emotional questions, recognition was better with focus on one's own emotions ($\underline{M}$ = .84) rather than with a focus on the emotions of the speaker ($\underline{M}$ = .74), $\underline{t}$(58) = 1.89, $\underline{p}$ =.03, $\underline{r}$=.24. However, for perceptual questions, there was no difference between focus on the self ($\underline{M}$ = .41) and focus on the other ($\underline{M}$ = .47), $\underline{t}$(58) = 1.12, $\underline{p}$ = .13, $\underline{r}$ = .15. See Figure 1. Comparison of recognition in each of the encoding-focus groups to controls ($\underline{M}$ = .61) showed that recognition was reliably higher than controls for both emotion groups: for emotional-other ($\underline{M}$ = .74), $\underline{t}$(58) = 2.53 $\underline{p}$ = .00, $\underline{r}$ = .32, and for emotional-self ($\underline{M}$ = .84), $\underline{t}$(58) = 5.2, $\underline{p}$ = .00 $\underline{r}$ = .56. That is, both kinds of emotional questions enhance recognition memory, although emotional questions about the self have a greater enhancement effect than questions about the speaker. By contrast, for the perceptual groups, recognition was lower than in the control group in both cases: for perceptual-other ($\underline{M}$ = .47), $\underline{t}$(58) =3.24 , $\underline{p}$ = .00, $\underline{r}$ = .39 and for perceptual-self ($\underline{M}$ = .41), $\underline{t}$(58) = 4.33 $\underline{p}$ = .00 $\underline{r}$ = .49.

Hits. To examine the age effect in corrected recognition, two separate ANOVAs were conducted on hit rates and false alarm rates. These analyses suggest that the effects reported above depend more on false alarm rates than on hit rates. A 2 (age) x 2 (encoding condition: emotional or perceptual) x 2 (focus: self or other) ANOVA for hit rates revealed no main effect of age, $\underline{F}$(1, 112) = .023, $\underline{p}$ = .88, although there was a main effect of encoding condition, $\underline{F}$(1,112) = 48.95, $\underline{p}$ = .00. Hits were higher in emotional encoding conditions ($\underline{M}$ = .94) than in perceptual conditions ($\underline{M}$ = .77). There were no

significant interactions. Comparison of hits in each encoding condition to the control condition showed that hits were higher in emotional conditions than in the control group (M = .87), $t(88)$ = 3.32, p = .00, r = .33 and hits were lower in the perceptual conditions than in the control group, $t(88)$ = 2.87, p = .00, r = .29.

False alarms. By contrast with the analysis of hits, a 2 (age) x 2 (encoding condition: emotional or perceptual) x 2 (focus: self or other) ANOVA of false alarm rates showed effects more similar to those seen in overall corrected recognition: significant main effects of both age, $F(1, 112)$ = 14.10, p = .00 and encoding condition, $F(1,112)$ = 15.75, p = .00. There were more false alarms from 4-year-olds (M = .33) than 6-year-olds (M = .17). There were more false alarms in the perceptual conditions (M = .33) than in the emotional conditions (M = .16). In addition, there was a significant interaction of focus and encoding, $F(1, 112)$ = 6.82, p = .01. Mirroring the effect on corrected recognition scores, false alarms were lower with focus on one's own emotions (M = .11) rather than those of the speaker (M = .22), $t(58)$ = 1.97, p =.00, r = .25. However, for perceptual questions, there was no difference between focus on the self (M = .39) and focus on the other (M = .28), $t(58)$ = 1.61, p = .06, r = .21. We also compared false-alarm rates in each of the encoding-focus groups to the control group (M = .27). False-alarms were lower in the emotional-self condition (M = .11) compared to the control group, $t(58)$ = 3.75, p = .00, r = ..44. False-alarms were higher in the perceptual-self condition (M = .39) compared to the control group, $t(58)$ = 2.09, p = .02, r = .26. None of the other comparisons were significant.

Source Monitoring Scores

Source monitoring scores were the central focus of this study, and they are shown

in Table 2. Chance on this measure is .50. A 2 (age) x 2 (encoding condition: emotional

or perceptual) x 2 (focus: self or other) ANOVA revealed a main effect of age, $\underline{F}$(1, 112)

= 11.98, $\underline{p}$ = .001, a main effect of focus, $\underline{F}$(1,112) = 42.78, $\underline{p}$ = .00, and a trend towards a

main effect of encoding condition, $\underline{F}$(1,112) = 3.32, p = .07. As expected, 6-year-olds ($\underline{M}$

= .71) showed better accuracy than 4-year-olds ($\underline{M}$ = .61). Confirming prior work, source

accuracy was better with other-focus ($\underline{M}$=.80) than with self-focus ($\underline{M}$ = .56). In addition,

the overall mean for perceptual conditions ($\underline{M}$ = .63) was somewhat lower than that for

emotional conditions ($\underline{M}$ = .68).

All of these main effects were, however, qualified by significant interactions,

between age and encoding, $\underline{F}$(1,112) = 6.19, $\underline{p}$ = .01, and between focus and encoding,

$\underline{F}$(1, 112) = 5.83, $\underline{p}$ = .02. The age by encoding interaction resulted from the difficulty 4-

year-old children had with answering source questions when they were in perceptual

encoding conditions. Source accuracy in this case ($\underline{M}$ =.55) was not different from

chance, and was worse than source accuracy for the 4 year-olds in emotion conditions ($\underline{M}$

= .67. Source accuracy for 6-year-olds did not differ between conditions: in perceptual

conditions, $\underline{M}$ = .71 and in emotion conditions, $\underline{M}$ = .69. Another way of looking at this

interaction is to say that there were age-related improvements in source accuracy for

perceptual but not emotional conditions.

Most theoretically central, however, was the focus by encoding interaction. As

found in prior research, source accuracy was higher in the emotional-other condition ($\underline{M}$

= .80) than in the emotional-self condition ($\underline{M}$ = .56), $\underline{t}$(58) = 6.83, $\underline{p}$= .00, $\underline{r}$ =.67. In

addition, source accuracy was higher in the perceptual-other condition ($\underline{M}$ = .69) than in

the perceptual-self condition ($\underline{M}$ = .58), $\underline{t}(58)$= 2.42, $\underline{p}$ = .00, $\underline{r}$ = .30. However, the

difference between focus on self versus focus on other was more marked in the emotional

conditions than in the perceptual conditions, t = 1.84, $\underline{p}$ = .03. See Figure 2.

We also compared each encoding-focus condition to the Control condition ($\underline{M}$ =

.68) to determine if there were facilitation or interference effects or both (corrected alpha

p = . 01). Performance in the Emotional-other condition ($\underline{M}$ = .80) was better than

performance in the Control condition, $\underline{t}$ (58) = 3.07 $\underline{p}$ = .00 $\underline{r}$ = .37. Performance in the

Emotional-self condition ($\underline{M}$ = .56) was worse than performance in the Control condition,

$\underline{t}$ (58) = 2.7, $\underline{p}$ = .00, r = .33. None of the other effects were significant (see Figure 2).

Discussion

Analyses of recognition accuracy showed the expected effects on recognition.

Six-year-olds' recognition scores were better than 4-year-olds' scores and, more

interestingly, this difference was due to 4-year-olds committing more false alarms than 6-

year-olds. Lloyd, Newcombe and Doydum (2009) have found this pattern also, and

suggest that younger children's difficulty in avoiding stating they have seen stimuli

similar to those they have seen before is due to their reliance on familiarity for

recognition, and their insufficient use of (or lack of ability to use) recollection. In

addition, children in the Emotional-self condition had better recognition than children in

the other conditions, primarily due to making fewer false alarms than children in the

other conditions. Johnson et al. (1996) suggest that focusing on one's own feelings,

opinions, and reactions to a particular statement induces the content of that statement to

be embedded into meaningful self-relevant information. In turn, this information should

lead to better recognition of a particular statement. In the present study, the finding that

recognition scores in the perceptual conditions were poor further supports this notion. Thinking about perceptual attributes directs attention away from the content of the statements.

Turning to source monitoring, there were two main aims of the present study. First, this study was designed to examine whether the higher source accuracy found in Kovacs and Newcombe (2006) when children directed attention to the emotions of the speaker was the result of any attentional shift in direction of focus or if instructions to consider emotion are central to the effect. The data suggest a bit of both. Children focused on the speaker did better than children focused on the self in judging source, whether in emotional or in perceptual conditions. However, the effect was significantly larger for the emotional conditions. This suggests that focusing on the speakers' emotional reactions to the statements was more beneficial to source monitoring than merely focusing on the speaker in general. This notion is further supported by analyses related to the second aim, determining whether source accuracy is enhanced or hurt relative to a control group given no particular instructions about focus. The data showed that children's performance in the Emotional-other condition was uniquely better than children's performance in the Control condition. The reason for this unique enhancement is that the instructions ask children to think about the speaker in relation to the statement, thus binding the two together. By contrast, thinking about perceptual aspects of the speaker helps to "tag" the speaker, but not necessarily in relation to the statement just made.

This analysis still leaves open, however, that the question of whether the enhanced effect of focus on the emotions of the other is due to a focus on emotion per se.

Children in the perceptual-other condition were thinking about the speaker alone, not the speaker in relation to the statement she made. Perhaps any focus that directs attention to the content of the statement in relation to the speaker would help source accuracy, even if it were not emotional, because a manipulation of this kind would still enhance processing of speaker traits in relation to the content of the statement, binding them together. For example, if a movie reviewer gave "two thumbs up" to a horror movie, and a reader spent some time considering whether the reviewer generally enjoys horror films or whether this endorsement is an exception, perhaps the reader's memory for which reviewer endorsed the movie would be enhanced. This possibility was explored in Experiment 2.

Experiment 2

The purpose of this experiment was to examine whether the enhancement in source accuracy in the Emotional-other condition found in Experiment 1 is the result of emotional processing in particular or simply the result of focusing on the content of a statement as related to the source of the statement. Three conditions were included in this study: Semantic-self, Semantic-other, and a Control condition. If the nature of the self-other effect is due to drawing attention to the content of the statement in relation to the speaker, independent of emotional processing, scores in the Semantic-other condition should be better than scores in both the Semantic-self and control conditions.

Method

Participants

This study included 90 children: 45 four-year-olds (23 males, 22 females, mean age = 54.05 months, range 48 to 59 months) and 45 six-year-olds (20 males, 25 females, mean age = 76.89 months, range 72 to 83 months). The children were recruited from

suburban preschools in the Philadelphia area and the majority of the children were white and middle-class. Informed consent was obtained from the parent or guardian of each child. Participants were randomly assigned to the encoding focus conditions.

<u>Design and Procedures</u>

This study was identical to Experiment 1 except that the encoding conditions were <u>Semantic self-focus</u>, <u>Semantic other-focus</u>, and a <u>No-focus control</u> condition. The children watched the same video as in Experiment 1, but children in the semantic conditions were oriented to focus on the semantic content of the statement. Children in the <u>Semantic self-focus</u> were asked to respond to the statement as it related to their own experiences of what the speaker said ("Have you ever done that?"). Children in the <u>Semantic other-focus</u> condition were asked to respond to the statement relating to whether or not the speaker could actually do what she had said (e.g., "Can she really do that?"). For example, if the statement heard was "I rode an elephant at the zoo", children in the Semantic self-focus were asked if they themselves had ever ridden an elephant at the zoo (i.e., "Have you ever done that?"). On the other hand, children in the Semantic other-focus were asked if the speaker could really ride an elephant at the zoo (i.e., "Can she really do that?"). As in Experiment 1, children in the Control condition were periodically asked about the quality and sound of the video (e.g., "Is the sound loud enough for you to hear?") to help redirect their attention if needed. As in Experiment 1, none of the children showed difficulty answering any of the practice questions or difficulty understanding what they should think about during the video.

<div align="center">Results</div>

An alpha level of .05 was used for all statistical analyses. For all t-tests, the p-values are two-tailed. When appropriate, Tukey HSD post-hoc tests were used. Effect sizes are reported as Pearson r. Initial analyses produced no main effects of sex or sex interactions, and thus the data were collapsed across sex.

Old/New Recognition

Recognition scores were calculated as in Experiment 1. Table 3 shows the proportion of hits, false alarms, and corrected recognition. Chance on this measure is zero.

Corrected recognition. A 2 (age) x 2 (focus: self or other) ANOVA produced a significant main effect of age, $F(1, 56) = 52.45$ $p = .00$. Four-year-olds' scores ($M = .48$) were lower than 6-year-olds' scores ($M = .87$). There was neither a main effect for focus, $F(1,56) = 3.42$, $p = .07$, nor an interaction of age and focus, $F (1, 56) = .498$, $p = .483$. Comparison of recognition in each of the focus groups to controls ($M = .66$) showed no differences for either the self-focus group ($M = .62$), $t(58) = .44$, $p = .33$, $r = .06$ or the other-focus group ($M = .73$), $t(58) = .82$, $p = .207$, $r = .15$.

Hits. Separate analyses of hits and false alarms suggested that the age effect reported above depends more on the false alarm rates than hit rates. A 2 (age) x 2 (focus: self or other) ANOVA for hit rates revealed no age effect, $F(1, 56) = .679$, $p = .413$, no focus effect, $F(1,56) = .043$, $p = .837$, and no interaction effect, $F (1, 56) = 2.45$, $p = .123$. Comparison of hits in each encoding condition to the control condition showed that hit rates in the control group ($M = .91$) were higher than hit rates in both the self-group ($M = .82$), $t(58) = 2.26$, $p = .01$, $r = .28$ and the other-group ($M = .85$), $t(58) = 2.13$, $p = .02$, $r = .27$.

False alarms. A 2 (age) x 2 (focus: self or other) ANOVA of false alarm rates showed an age effect, $\underline{F}$(1, 56) = 20.32, $\underline{p}$ =.00. Four-year-olds ($\underline{M}$ = .28) committed more false alarms than 6-year-olds ($\underline{M}$ = .04). None of the other effects were significant. We also compared false-alarm rates in each of the focus groups to the control group ($\underline{M}$ = .25). There were no differences between the self-group ($\underline{M}$ = .20) and the control group, $\underline{t}$(58) = .725, $\underline{p}$ = .24, $\underline{r}$ = .09. False-alarm rates were lower in the other-focus group ($\underline{M}$ = .12) than false-alarm rates in the control group, $\underline{t}$(58) = 1.68, $\underline{p}$ = .05, $\underline{r}$ = .22.

Source Monitoring Scores

Source monitoring proportions are shown in Table 4. Chance on this measure is .50. A 2 (age) x 2 (focus: self or other) ANOVA revealed no significant effect for age, $\underline{F}$(1, 56) = .68, $\underline{p}$ =.41, no effect for focus, $\underline{F}$(1,56) = .04, $\underline{p}$ =.84, and no interaction effect, $\underline{F}$ (1, 56) = 2.45, $\underline{p}$ = .12. We also compared each focus condition to the control condition ($\underline{M}$ = .76). Scores in the Semantic-self group ($\underline{M}$ = .68) were lower than scores in the control group, $\underline{t}$(58) = 1.69, $\underline{p}$ =.05, $\underline{r}$ = .22. There were no differences between scores in the Semantic-other group ($\underline{M}$ = .69) and the control group, $\underline{t}$(58) = 1.36, $\underline{p}$ = .09, $\underline{r}$ = .18.

Discussion

The purpose of Experiment 2 was to explore whether any focus that encourages binding between the speaker and content of the statement improves source monitoring or if emotional processing is the key. The data showed no differences between the Semantic-self and Semantic-other focus conditions, for either age group. Furthermore, the Semantic-other focus did not enhance source monitoring compared to the Control, unlike in Experiment 1 where the Emotional-other focus improved source monitoring. In

addition, the improvement in recognition memory scores with self-focus was not found with a semantic task.

General Discussion

There were two aims to the experiments in this paper. First, we examined whether the self-other effect was due to any attentional shift in the direction of focus (i.e., inward or outward) or if particular aspects of these instructions are central to the effect. Second, we examined whether focusing on the other facilitates source monitoring or if focusing on the self impairs source monitoring. In Experiment 1, source monitoring scores in the Emotional-other condition were better than scores in the Perceptual-other condition and the Control condition. In Experiment 2, scores in the Semantic-other condition showed no improvement over the scores in the Control condition. These results suggest that directing attention during encoding to emotion as it relates to the content of the statement may be a particularly successful condition for enhancing source monitoring, for either of both of two possible reasons.

First, it is possible that considering emotions about a statement is special in some way. For example, knowing what makes other people tick (e.g., why they like broccoli but hate horror films) may be very important for social relations with that person. Second, however, the Emotional-other condition may simply be a particularly efficacious way to direct simultaneous attention toward the speaker and the content of the statement. Asking participants to consider the speaker's possible emotions seems ideal for encouraging binding between the speaker and various characteristics of the statement. The Perceptual-other condition used in Experiment 1 only focuses attention on the speaker, but not the

speaker's relation to the statement. The Semantic-other condition used in Experiment 2 focuses attention on the statement, but not (enough) on the person.

It is still an open question if there are non-emotional ways to encourage such binding that have not yet been tried. For example, speculating on *why* the speaker does not like broccoli might work, and yet be relatively non-emotional. This might be especially true if the speaker were talking about an unusual state of affairs (e.g., claiming to eat ice cream with a fork). However, it can also be argued that the vividness added by emotion seems likely to make binding easier than many cognitive tasks. The image of the horror on the speaker's face and in her voice as she is asked to contemplate eating a hated vegetable creates a stronger association between speaker and statement than can easily be created by other means, and is, arguably, emotional. The importance of emotion is also suggested by the fact that recognition memory is uniquely enhanced by thinking about one's own emotions about statements, although, again, there may be non-emotional manipulations that could have this effect. Subsequent work on non-emotional focus should involve manipulations that are vivid and motivating, and that require more processing of the relation between statements and aspects that differentiate particular speakers (e.g., their age, strength, profession). This research could help to clarify whether emotional processing is special, or merely a natural and effective way of either encouraging processing of a statement (enhancing recognition memory) or of a speaker's relation to the statement (enhancing source monitoring).

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APPENDIX

LIST OF STATEMENTS USED IN THE SOURCE MONITORING TASK

<u>Speaker A</u>

My Dad gave me a present today.

Worms are my favorite food.

I lost my favorite shirt at the park.

I had to eat broccoli today.

I flew in a helicopter.

My best friend doesn't like me anymore.

All the kids at my camp laugh at me.

<u>Speaker B</u>

I can't ride my bike today because it is raining.

My teacher said I am the smartest one in the class.

I touched a dolphin at the aquarium today.

I rode an elephant at the zoo.

I went to the library today.

I had alligator meat for dinner last night.

My sister hit me in the face.

<u>New statements</u>

I dropped all my money at the store today.

I take my cat for walks every day.

My brother put a snake in my bed last night.

My Grandmother makes me eat carrots.

I came in first place in a race today.

I had my favorite potato chips for dessert.

I am not allowed to play outside with my friends.

Table 1.

Recognition Scores for Age and Encoding Condition (Experiment 1)

Condition	4- year- olds					6- year- olds				
	Control	ES	EO	PS	PO	Control	ES	EO	PS	PO
Hits	.86 (.04)	.93 (.02)	.92 (.02)	.80 (.04)	.79 (.06)	.89 (.03)	.97 (.02)	.95 (.02)	.79 (.03)	.70 (.04)
False Alarms	.32 (.05)	.16 (.07)	.33 (.08)	.47 (.07)	.34 (.08)	.21 (.03)	.06 (.02)	.10 (.04)	.31 (.06)	.21 (.05)
Corrected Recognition	.55 (.03)	.76 (.05)	.63 (.05)	.33 (.06)	.44 (.06)	.68 (.03)	.91 (.03)	.84 (.05)	.49 (.04)	.49 (.04)

Notes: ES Emotional-self; EO Emotional-other; PS Perceptual-self; PO Perceptual-other
Standard errors are in parentheses.

Table 2.

Source Monitoring Scores for Age and Encoding Condition (Experiment 1)

	4-year-olds	6-year-olds
Control	.61 (.05)	.75 (.04)
Emotional-self	.58 (.03)	.53* (.04)
Emotional-other	.75 (.03)	.85 (.03)
Perceptual-self	.49* (.05)	.66 (.04)
Perceptual-other	.61 (.04)	.77 (.03)

Note: Standard errors in parentheses
* denotes scores at chance

Table 3.

Recognition Scores for Age and Encoding Condition (Experiment 2)

Condition	4- year- olds			6- year- olds		
	Control	SS	SO	Control	SS	SO
Hits	.88 (.03)	.72 (.05)	.79 (.03)	.94 (.02)	.92 (.03)	.91 (.02)
False Alarms	.35 (.09)	.31 (.06)	.24 (.08)	.14 (.07)	.08 (.03)	.009 (.009)
Corrected Recognition	.53 (.09)	.41 (.06)	.55 (.08)	.80 (.07)	.84 (.05)	.91 (.01)

Note: SS Semantic-self; SO Semantic-other

Table 4.

Source Monitoring Scores for Age and Encoding Condition (Experiment 2)

	4-year-olds	6-year-olds
Control	.70 (.06)	.81 (.03)
Semantic-self	.62 (.04)	.73 (.04)
Semantic-other	.71 (.05)	.67 (.05)

Note: Standard errors in parentheses
* denotes scores at chance

Figure 1.
Corrected Recognition scores with standard errors (Exp. 1)

Self   Other   Self   Other
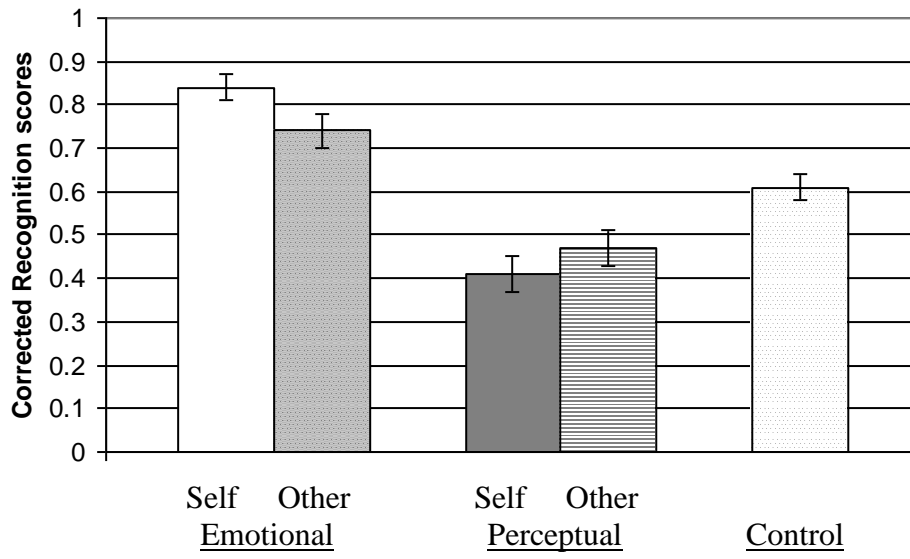<u>Emotional</u>   <u>Perceptual</u>   <u>Control</u>

Figure 2.
Source Monitoring scores with standard errors (Exp. 1)