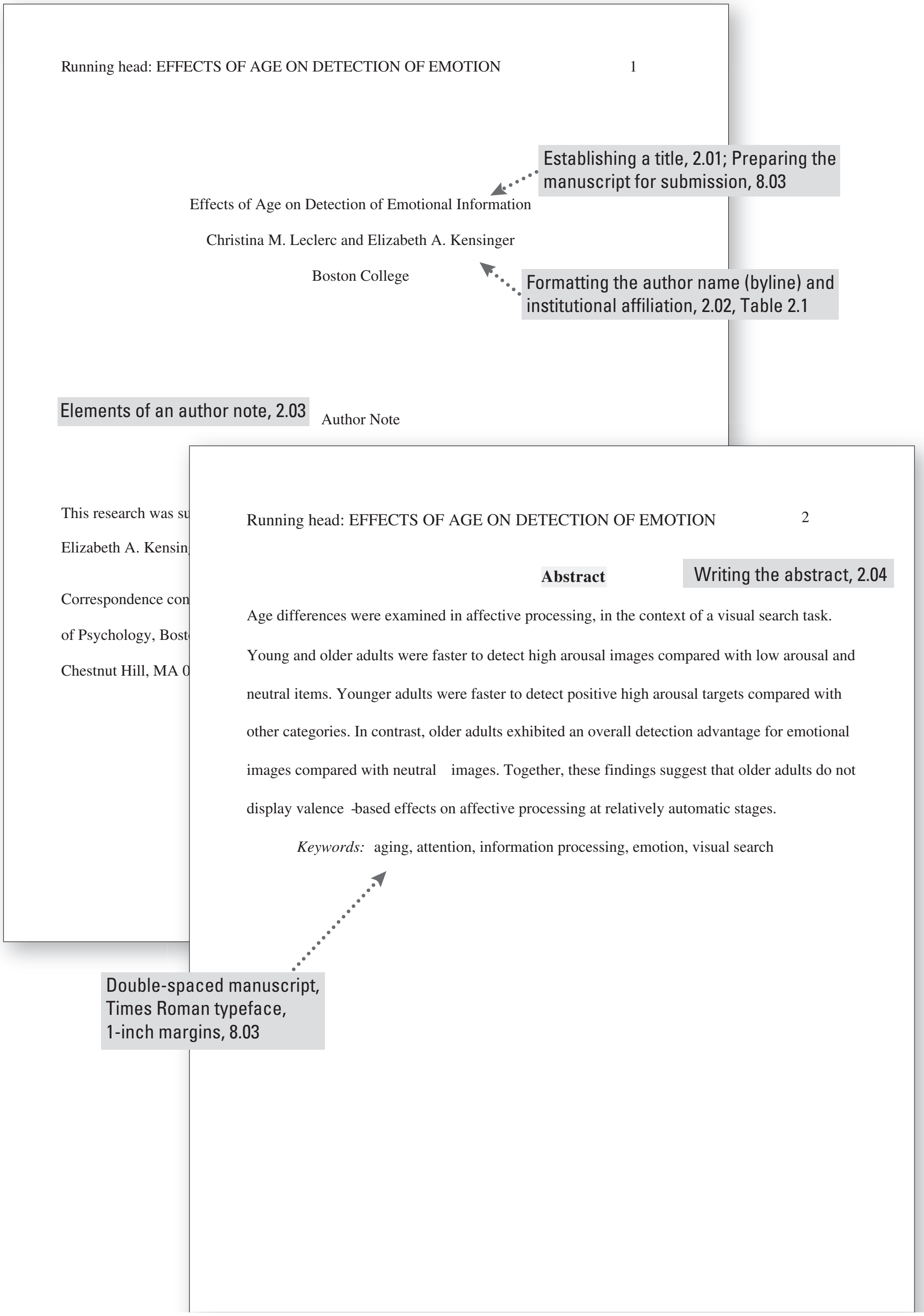
Figure 2.1. Sample One-Experiment Paper (The numbers refer to numbered sections in the *Publication Manual*.)



Running head: EFFECTS OF AGE ON DETECTION OF EMOTION 1

Effects of Age on Detection of Emotional Information

Christina M. Leclerc and Elizabeth A. Kensinger

Boston College

Author Note

This research was su

Elizabeth A. Kensin

Correspondence con

of Psychology, Bost

Chestnut Hill, MA 0

Running head: EFFECTS OF AGE ON DETECTION OF EMOTION 2

Abstract

Age differences were examined in affective processing, in the context of a visual search task. Young and older adults were faster to detect high arousal images compared with low arousal and neutral items. Younger adults were faster to detect positive high arousal targets compared with other categories. In contrast, older adults exhibited an overall detection advantage for emotional images compared with neutral images. Together, these findings suggest that older adults do not display valence-based effects on affective processing at relatively automatic stages.

Keywords: aging, attention, information processing, emotion, visual search

Paper adapted from “Effects of Age on Detection of Emotional Information,” by C. M. Leclerc and E. A. Kensinger, 2008, *Psychology and Aging, 23,* pp. 209–215. Copyright 2008 by the American Psychological Association.

Figure 2.1. Sample One-Experiment Paper (continued)

Running head: EFFECTS OF AGE ON DETECTION OF EMOTION 3

Writing the introduction, 2.05

Effects of Age on Detection of Emotional Information

Frequently, people encounter situations in their environment in which it is impossible to attend to all available stimuli. It is therefore of great importance for one's attentional processes to select only the most salient information in the environment to which one should attend. Previous research has suggested that emotional information is privy to attentional selection in young adults (e.g., Anderson, 2005; Calvo & Lang, 2004; Carretie, Hinojosa, Marin-Loeches, Mecado & Tapia, 2004; Nummenmaa, Hyona, & Calvo, 2006), an obvious service to evolutionary drives to approach rewarding situations and to avoid threat and danger (Davis & Whalen, 2001; Dolan & Vuilleumier, 2003; Lang, Bradley, & Cuthbert, 1997; LeDoux, 1995).

Ordering citations within the same parentheses, 6.16

Selecting the correct tense, 3.18

For example, Ohman, Flykt, and Esteves (2001) presented participants with 3 × 3 visual arrays with images representing four categories (snakes, spiders, flowers, mushrooms). In half the arrays, all nine images were from the same category, whereas in the remaining half of the arrays, eight images were from one category and one image was from a different category (e.g., 8 flowers and 1 snake). Participants were asked to indicate whether the matrix included a discrepant stimulus. Results indicated that fear-relevant images were more quickly detected than

fear-irrelev
were fearfu
attention-g
not attende
Merikle, 20
not limited
detected ra

Numbers that represent statistical or mathematical functions, 4.31

Numbers expressed in words, 4.32

Use of hyphenation for compound words, 4.13, Table 4.1

Running head: EFFECTS OF AGE ON DETECTION OF EMOTION 4

Calvo & Lang, 2004; Carretie et al., 2004; Juth, Lundqvist, Karlsson, & Ohman, 2005; Nummenmaa et al., 2006).

From this research, it seems clear that younger adults show detection benefits for arousing information in the environment. It is less clear whether these effects are preserved across the adult life span. The focus of the current research is on determining the extent to which aging influences the early, relatively automatic detection of emotional information.

Continuity in presentation of ideas, 3.05

Regions of the brain thought to be important for emotional detection remain relatively intact with aging (reviewed by Chow & Cummings, 2000). Thus, it is plausible that the detection of emotional information remains relatively stable as adults age. However, despite the preservation of emotion-processing regions with age (or perhaps because of the contrast between the preservation of these regions and age-related declines in cognitive-processing regions; Good et al., 2001; Hedden & Gabrieli, 2004; Ohnishi, Matsuda, Tabira, Asada, & Uno, 2001; Raz, 2000; West, 1996), recent behavioral research has revealed changes that occur with aging in the regulation and processing of emotion. According to the socioemotional selectivity theory (Carstensen, 1992), with aging, time is perceived as increasingly limited, and as a result, emotion regulation becomes a primary goal (Carstensen, Isaacowitz, & Charles, 1999). According to socioemotional selectivity theory, age is associated with an increased motivation to derive emotional meaning from life and a simultaneous decreasing motivation to expand one's knowledge base. As a consequence of these motivational shifts, emotional aspects of the

Citing one work by six or more authors, 6.12

No capitalization in naming theories, 4.16

Figure 2.1. Sample One-Experiment Paper (continued)

Running head: EFFECTS OF AGE ON DETECTION OF EMOTION 5

To maintain positive affect in the face of negative age-related change (e.g., limited time remaining, physical and cognitive decline), older adults may adopt new cognitive strategies. One such strategy, discussed recently, is the positivity effect (Carstensen & Mikels, 2005), in which older adults spend proportionately more time processing positive emotional material and less time processing negative emotional material. Studies examining the influence of emotion on memory (Charles, Mather, & Carstensen, 2003; Kennedy, Mather, & Carstensen, 2004) have found that compared with younger adults, older adults recall proportionally more positive information and proportionally less negative information. Similar results have been found when examining eye-tracking patterns: Older adults looked at positive images longer than younger adults did, even when no age differences were observed in looking time for negative stimuli (Isaacowitz, Wadlinger, Goren, & Wilson, 2006). However, this positivity effect has not gone uncontested; some researchers have found evidence inconsistent with the positivity effect (e.g., Grühn, Smith, & Baltes, 2005; Kensinger, Brierley, Medford, Growdon, & Corkin, 2002).

Based on this previously discussed research, three competing hypotheses exist to explain age differences in emotional processing associated with the normal aging process. First,

emotional information m

facilitated detection of en

emotional information m

detection of emotional in

principally on positive en

not negative, emotional i

The primary goal

To do so, we employed a

Using the colon between two grammatically complete clauses, 4.05

Capitalization of words beginning a sentence after a colon, 4.14

Hypotheses and their correspondence to research design, Introduction, 2.05

Running head: EFFECTS OF AGE ON DETECTION OF EMOTION

rapidly detect emotional information. We hypothesized that on the whole, older adults would be slower to detect information than young adults would be (consistent with Hahn, Carlson, Singer, & Gronlund, 2006; Mather & Knight, 2006); the critical question was whether the two age groups would show similar or divergent facilitation effects with regard to the effects of emotion on item detection. On the basis of the existing literature, the first two previously discussed hypotheses seemed to be more plausible than the third alternative. This is because there is reason to think that the positivity effect may be operating only at later stages of processing (e.g., strategic, elaborative, and emotion regulation processes) rather than at the earlier stages of processing involved in the rapid detection of information (see Mather & Knight, 2005, for discussion). Thus, the first two hypotheses, that emotional information maintains its importance across the life span or that emotional information in general takes on greater importance with age, seemed particularly applicable to early stages of emotional processing.

Indeed, a couple of prior studies have provided evidence for intact early processing of emotional facial expressions with aging. Mather and Knight (2006) examined young and older adults' abilities to detect happy, sad, angry, or neutral faces presented in a complex visual array. Mather and Knight found that like younger adults, older adults detected threatening faces more quickly than they detected other types of emotional stimuli. Similarly, Hahn et al. (2006) also found no age differences in efficiency of search time when angry faces were presented in an array of neutral faces, compared with happy faces in neutral face displays. When angry faces, compared with positive and neutral faces, served as nontarget distractors in the visual search arrays, however, older adults were more efficient in searching, compared with younger adults,

Using the semicolon to separate two independent clauses not joined by a conjunction, 4.04

Using the comma between elements in a series, 4.03

Punctuation with citations in parenthetical material, 6.21

Citing references in text, inclusion of year within paragraph, 6.11, 6.12

Prefixes and suffixes that do not require hyphens, Table 4.2

Figure 2.1. Sample One-Experiment Paper (continued)

negative stimuli were not of equivalent arousal levels (fearful faces typically are more arousing than happy faces; Hansen & Hansen, 1988). Given that arousal is thought to be a key factor in modulating the attentional focus effect (Hansen & Hansen, 1988; Pratto & John, 1991; Reimann & McNally, 1995), to more clearly understand emotional processing in the context of aging, it is necessary to include both positive and negative emotional items with equal levels of arousal.

In the current research, therefore, we compared young and older adults' detection of four categories of emotional information (positive high arousal, positive low arousal, negative high arousal, and negative low arousal) with their detection of neutral information. The positive and negative stimuli were carefully matched on arousal level, and the categories of high and low arousal were closely matched on valence to assure that the factors of valence (positive, negative) and arousal (high, low) could be investigated independently of one another. Participants were presented with a visual search task including images from these different categories (e.g., snakes, cars, teapots). For half of the multi-image arrays, all of the images were of the same item, and for the remaining half of the arrays, a sing
items was included. Participants were
the array, and their reaction times wer
differences in response times (RTs) ba
categories. We reasoned that if young
information, then we would expect sir
stimuli for the two age groups. By cor
were younger adults, older adults shou
emotional items (relative to the neutra

Prefixed words that require hyphens, Table 4.3

Using abbreviations, 4.22; Explanation of abbreviations, 4.23; Abbreviations used often in APA journals, 4.25; Plurals of abbreviations, 4.29

Identifying subsections within the Method section, 2.06

Using numerals to express numbers representing age, 4.31

Elements of the Method section, 2.06; Organizing a manuscript with levels of heading, 3.03

Participant (subject) characteristics, Method, 2.06

for the arousing items than shown by the young adults (resulting in an interaction between age and arousal).

Method

Participants

Younger adults (14 women, 10 men, M_{age} = 19.5 years, age range: 18–22 years) were recruited with flyers posted on the Boston College campus. Older adults (15 women, 9 men, M_{age} = 76.1 years, age range: 68–84 years) were recruited through the Harvard Cooperative on Aging (see Table 1, for demographics and test scores).[1] Participants were compensated $10 per hour for their participation. There were 30 additional participants, recruited in the same way as described above, who provided pilot rating values: 5 young and 5 old participants for the assignment of items within individual categories (i.e., images depicting cats), and 10 young and 10 old participants for the assignment of images within valence and arousal categories. All participants were asked to bring corrective eyewear if needed, resulting in normal or corrected to normal vision for all participants.

Materials and Procedure

The visual search task was adapted from Ohman et al. (2001). There were 10 different types of items (2 each of five Valence × Arousal categories: positive high arousal, positive low arousal, neutral, negative low arousal, negative high arousal), each containing nine individual exemplars that were used to construct 3 × 3 stimulus matrices. A total of 90 images were used, each appearing as a target and as a member of a distracting array. A total of 360 matrices were presented to each participant; half contained a target item (i.e., 8 items of one type and 1 target item of another type) and half did not (i.e., all 9 images of the same type). Within the 180

Figure 2.1. Sample One-Experiment Paper (continued)

matrix. Within the 180 target trials, each of the five emotion categories (e.g., positive high arousal, neutral, etc.) was represented in 36 trials. Further, within each of the 36 trials for each emotion category, 9 trials were created for each of the combinations with the remaining four other emotion categories (e.g., 9 trials with 8 positive high arousal items and 1 neutral item). Location of the target was randomly varied such that no target within an emotion category was presented in the same location in arrays of more than one other emotion category (i.e., a negative high arousal target appeared in a different location when presented with positive high arousal array images than when presented with neutral array images).

Latin abbreviations, 4.26

The items within each category of grayscale images shared the same verbal label (e.g., mushroom, snake), and the items were selected from online databases and photo clipart packages. Each image depicted a photo of the actual object. Ten pilot participants were asked to write down the name corresponding to each object; any object that did not consistently generate the intended response was eliminated from the set. For the remaining images, an additional 20 pilot participants rated the emotional valence and arousal of the objects and assessed the degree of visual similarity among objects within a set (i.e., how similar the mushrooms were to one another) and between objects across sets (i.e., how similar the mushrooms were to the snakes).

Numbers expressed in words at beginning of sentence, 4.32

Valence and arousal ratings. Valence and arousal were judged on 7-point scales (1 = *negative valence* or *low arousal* and 7 = *positive valence* or *high arousal*). Negative objects received mean valence ratings of 2.5 or lower, neutral objects received mean valence ratings of 3.5 to 4.5, and positive objects received mean valence ratings of 5.5 or higher. High arousal objects received mean arousal ratings greater than 5, and low arousal objects (including all neutral stimuli) received mean arousal ratings of less than 4. We selected categories for which both young and older adults agreed on the valence and arousal classifications, and stimuli were

Italicization of anchors of a scale, 4.21

positive high arousal
h arousal.
etween-categories
f exemplars (e.g., a set
the rest of the
cipants made these
sual dimensions in
ated how similar
ilar the mushrooms
equated on within-
s well as for the

overall similarity of the object categories (*ps* > .20). For example, we selected particular mushrooms and particular cats so that the mushrooms were as similar to one another as were the cats (i.e., within-group similarity was held constant across the categories). Our object selection also assured that the categories differed from one another to a similar degree (e.g., that the mushrooms were as similar to the snakes as the cats were similar to the snakes).

Procedure

Each trial began with a white fixation cross presented on a black screen for 1,000 ms; the matrix was then presented, and it remained on the screen until a participant response was recorded. Participants were instructed to respond as quickly as possible with a button marked *yes* if there was a target present, or a button marked *no* if no target was present. Response latencies and accuracy for each trial were automatically recorded with E-Prime (Version 1.2) experimental

Figure 2.1. Sample One-Experiment Paper (continued)

software. Before beginning the actual task, participants performed 20 practice trials to assure compliance with the task instructions.

Results

Elements of the Results section, 2.07

Analyses focus on participants' RTs to the 120 trials in which a target was present and was from a different emotional category from the distractor (e.g., RTs were not included for arrays containing eight images of a cat and one image of a butterfly because cats and butterflies are both positive low arousal items). RTs were analyzed for 24 trials of each target emotion category. RTs for error trials were excluded (fewer than 5% of all responses) as were RTs that were ±3 *SD* from each participant's mean (approximately 1.5% of responses). Median RTs were then calculated for each of the five emotional target categories, collapsing across array type (see Table 2 for raw RT values for each of the two age groups). This allowed us to examine, for example, whether participants were faster to detect images of snakes than images of mushrooms, regardless of the type of array in which they were presented. Because our main interest was in examining the effects of valence and arousal on participants' target detection times, we created scores for each emotional target category that controlled for the participant's RTs to detect neutral targets (e.g., subtracting the RT to detect neutral targets from the RT to detect positive high arousal targets). These difference scores were then examined with a 2 × 2 × 2 (Age [young, older] × Valence [positive, negative] × Arousal [high, low]) analysis of variance (ANOVA). This ANOVA revealed only a significant main effect of arousal, $F(1, 46) = 8.41$, $p = .006$, $\eta_p^2 = .16$, with larger differences between neutral and high arousal images ($M = 137$) than between neutral and low arousal images ($M = 93$; i.e., high arousal items processed more quickly across both age groups compared with low arousal items; see Figure 1). There was no significant main effect for valence, nor was there an interaction between valence and arousal. It is critical that the analysis

Abbreviations accepted as words, 4.24

Symbols, 4.45; Numbers, 4.31

Nouns followed by numerals or letters, 4.17

Reporting *p* values, decimal fractions, 4.35

Statistical symbols, 4.46, Table 4.5

Numbering and discussing figures in text, 5.05

Figure 2.1. Sample One-Experiment Paper (continued)

revealed only a main effect of age but no interactions with age. Thus, the arousal-mediated effects on detection time appeared stable in young and older adults.

The results described above suggested that there was no influence of age on the influences of emotion. To further test the validity of this hypothesis, we submitted the RTs to the five categories of targets to a 2 × 5 (Age [young, old] × Target Category [positive high arousal, positive low arousal, neutral, negative low arousal, negative high arousal]) repeated measures ANOVA.[2] Both the age group, $F(1, 46) = 540.32, p < .001, \eta_p^2 = .92$, and the target category, $F(4, 184) = 8.98, p < .001, \eta_p^2 = .16$, main effects were significant, as well as the Age Group × Target Category interaction, $F(4, 184) = 3.59, p = .008, \eta_p^2 = .07$. This interaction appeared to reflect the fact that for the younger adults, positive high arousal targets were detected faster than targets from all other categories, $ts(23) < -1.90, p < .001$, with no other target categories differing significantly from one another (although there were trends for negative high arousal and negative low arousal targets to be detected more rapidly than neutral targets ($p < .12$). For older adults, all emotional categories of targets were detected more rapidly than were neutral targets, $ts(23) > 2.56, p < .017$, and RTs to the different emotion categories of targets did not differ significantly from one another. Thus, these results provided some evidence that older adults may show a broader advantage for detection of any type of emotional information, whereas young adults' benefit may be more narrowly restricted to only certain categories of emotional information.

Discussion

As outlined previously, there were three plausible alternatives for young and older adults' performance on the visual search task: The two age groups could show a similar pattern of enhanced detection of emotional information, older adults could show a greater advantage for

Statistics in text, 4.44

Spacing, alignment, and punctuation of mathematical copy, 4.46

Capitalize effects or variables when they appear with multiplication signs, 4.20

Elements of the Discussion section, 2.08

Figure 2.1. Sample One-Experiment Paper (continued)

emotional detection than young adults, or older adults could show a greater facilitation than young adults only for the detection of positive information The results lent some support to the first two alternatives, but no evidence was found to support the third alternative.

In line with the first alternative, no effects of age were found when the influence of valence and arousal on target detection times was examined; both age groups showed only an arousal effect. This result is consistent with prior studies that indicated that arousing information can be detected rapidly and automatically by young adults (Anderson, Christoff, Panitz, De Rosa, & Gabrieli, 2003; Ohman & Mineka, 2001) and that older adults, like younger adults, continue to display a threat detection advantage when searching for negative facial targets in arrays of positive and neutral distractors (Hahn et al., 2006; Mather & Knight, 2006). Given the relative preservation of
& Bennett, 2004; Jenni
to take advantage of the

However, despi
age groups, the present
age-related enhanceme
the five categories of e
high arousal images (as
advantage for detecting
suggests a broader influ
for the hypothesis that a

It is interesting t
that the positivity effect

Clear statement of support or nonsupport of hypotheses, Discussion, 2.08

processing, given that no effects of valence were observed in older adults' detection speed. In the present study, older adults were equally fast to detect positive and negative information, consistent with prior research that indicated that older adults often attend equally to positive and negative stimuli (Rosler et al., 2005). Although the pattern of results for the young adults has differed across studies—in the present study and in some past research, young adults have shown facilitated detection of positive information (e.g., Anderson, 2005; Calvo & Lang, 2004; Carretie et al., 2004; Juth et al., 2005; Nummenmaa et al., 2006), whereas in other studies, young adults have shown an advantage for negative information (e.g., Armony & Dolan, 2002; Hansen & Hansen, 1988; Mogg, Bradley, de Bono, & Painter, 1997; Pratto & John, 1991; Reimann & McNally, 1995; Williams, Mathews, & MacLeod, 1996)—what is important to note is that the older adults detected both positive and negative stimuli at equal rates. This equivalent detection of positive and negative information provides evidence that older adults display an advantage for the detection of emotional information that is not valence-specific.

Thus, although younger and older adults exhibited somewhat divergent patterns of emotional detection on a task reliant on early, relatively automatic stages of processing, we found no evidence of an age-related positivity effect. The lack of a positivity focus in the older adults is in keeping with the proposal (e.g., Mather & Knight, 2006) that the positivity effect does not arise through automatic attentional influences. Rather, when this effect is observed in older adults, it is likely due to age-related changes in emotion regulation goals that operate at later stages of processing (i.e., during consciously controlled processing), once information has been attended to and once the emotional nature of the stimulus has been discerned.

Although we cannot conclusively say that the current task relies strictly on automatic processes, there are two lines of evidence suggesting that the construct examined in the current

Use of an em dash to indicate an interruption in the continuity of a sentence, 4.06; Description of an em dash, 4.13

Figure 2.1. Sample One-Experiment Paper (continued)

Running head: EFFECTS OF AGE ON DETECTION OF EMOTION 15

research examines relatively automatic processing. First, in their previous work, Ohman et al. (2001) compared RTs with both 2 × 2 and 3 × 3 arrays. No significant RT differences based on the number of images presented in the arrays were found. Second, in both Ohman et al.'s (2001) study and the present study, analyses were performed to examine the influence of target location on RT. Across both studies, and across both age groups in the current work, emotional targets were detected more quickly than were neutral targets, regardless of their location. Together, these findings suggest that task performance is dependent on relatively automatic detection processes rather than on controlled search processes.

Although further work is required to gain a more complete understanding of the age-related changes in the early processing of emotional information, our findings indicate that young and older adults

study provides further

of emotional images ar

(Fleischman et al., 200

although there is evider

information (e.g., Carst

present results suggest

tasks require relatively

Use of parallel construction with coordinating conjunctions used in pairs, 3.23

Discussion section ending with comments on importance of findings, 2.08

Running head: EFFECTS OF AGE ON DETECTION OF EMOTION 16

References

Construction of an accurate and complete reference list, 6.22; General desciption of references, 2.11

Anderson, A. K. (2005). Affective influences on the attentional dynamics supporting awareness. *Journal of Experimental Psychology: General*, *154*, 258–281. doi:10.1037/0096-3445.134.2.258

Anderson, A. K., Christoff, K., Panitz, D., De Rosa, E., & Gabrieli, J. D. E. (2003). Neural correlates of the automatic processing of threat facial signals. *Journal of Neuroscience*, *23*, 5627–5633.

Armony, J. L., & Dolan, R. J. (2002). Modulation of spatial attention by fear-conditioned stimuli: An event-related fMRI study. *Neuropsychologia*, *40*, 817–826. doi:10.1016/S0028-3932%2801%2900178-6

Beck, A. T., Epstein, N., Brown, G., & Steer, R. A. (1988). An inventory for measuring clinical anxiety: Psychometric properties. *Journal of Consulting and Clinical Psychology*, *56*, 893–897. doi:10.1037/0022-006X.56.6.893

Calvo, M. G., & Lang, P. J. (2004). Gaze patterns when looking at emotional pictures: Motivationally biased attention. *Motivation and Emotion*, *28*, 221–243. doi: 10.1023/B%3AMOEM.0000040153.26156.ed

Carretie, L. Hinojosa, J. A., Martin-Loeches, M., Mecado, F., & Tapia, M. (2004). Automatic attention to emotional stimuli: Neural correlates. *Human Brain Mapping*, *22*, 290–299. doi:10.1002/hbm.20037

Carstensen, L. L. (1992). Social and emotional patterns in adulthood: Support for socioemotional selectivity theory. *Psychology and Aging*, *7*, 331–338. doi: 10.1037/0882-7974.7.3.331

Carstensen, L. L., Fung, H., & Charles, S. (2003). Socioemotional selectivity theory and the regulation of emotion in the second half of life. *Motivation and Emotion*, *27*, 103–123.

Figure 2.1. Sample One-Experiment Paper (continued)

Carstensen, L. L., & Mikels, J. A. (2005). At the intersection of emotion and cognition: Aging and the positivity effect. *Current Directions in Psychological Science*, *14*, 117–121. doi: 10.1111/j.0963-7214.2005.00348.x

Charles, S. T., Mather, M., & Carstensen, L. L. (2003). Aging and emotional memory: The forgettable na

Psychology: C

Chow, T. W., & Cum

Aggleton (Ed.

Oxford Unive

Davis, M., & Whalen

Grühn, D., Smith, J., & Baltes, P. B. (2005). No aging bias favoring memory for positive material: Evidence from a heterogeneity-homogeneity list paradigm using emotionally toned words. *Psychology and Aging*, *20*, 579–588. doi: 10.1037/0882-7974.20.4.579

Hahn, S., Carlson, C., Singer, S., & Gronlund, S. D. (2006). Aging and visual search: Automatic

doi:

rity

nitive

Aging,

s:

379–395.

-related

Kensinger, E. A., Brierley, B., Medford, N., Growdon, J. H., & Corkin, S. (2002). Effects of normal aging and Alzheimer's disease on emotional memory. *Emotion*, *2*, 118–134. doi: 10.1037/1528-3542.2.2.118

Lang, P. J., Bradley, M. M., & Cuthbert, B. N. (1997). Motivated attention: Affect, activation, and action. In P. J. Lang, R. F. Simons, & M. Balaban (Eds.), *Attention and orienting: Sensory and motivational processes* (pp. 97–135). Mahwah, NJ: Erlbaum.

Leclerc, C. M., & Hess, T. M. (2005, August). *Age differences in processing of affectively primed information*. Poster session presented at the 113th Annual Convention of the American Psychological Association, Washington, DC.

LeDoux, J. E. (1995). Emotion: Clues from the brain. *Annual Review of Psychology*, *46*, 209–235. doi:10.1146/annurev.ps.46.020195.001233

Mather, M., & Knight, M. (2005). Goal-directed memory: The role of cognitive control in older adults' emotional memory. *Psychology and Aging*, *20*, 554–570. doi: 10.1037/0882-7974.20.4.554

Mather, M., & Knight, M. R. (2006). Angry faces get noticed quickly: Threat detection is not impaired among older adults. *Journals of Gerontology, Series B: Psychological Sciences*, *61B*, P54–P57.

Mogg, K., Bradley, B. P., de Bono, J., & Painter, M. (1997). Time course of attentional bias for threat information in non-clinical anxiety. *Behavioral Research Therapy*, *35*, 297–303.

Nelson, H. E. (1976). A modified Wisconsin card sorting test sensitive to frontal lobe defects. *Cortex*, *12*, 313–324.

Digital object identifier as article identifier, 6.31; Example of reference to a periodical, 7.01

Example of reference to a book chapter, print verison, no DOI, 7.02, Example 25

Figure 2.1. Sample One-Experiment Paper (continued)

Running head: EFFECTS OF AGE ON DETECTION OF EMOTION 20

Nummenmaa, L., Hyona, J., & Calvo, M. G. (2006). Eye movement assessment of selective attentional capture by emotional pictures. *Emotion*, *6*, 257–268. doi: 10.1037/1528-3542.6.2.257

Ohman, A., Flykt, A., & Esteves, F. (2001). Emotion drives attention: Detecting the snake in the

7/0096-

l module

3-

orphology

mporal-

Article with more than seven authors, 7.01, Example 2

Running head: EFFECTS OF AGE ON DETECTION OF EMOTION 21

Rosler, A., Ulrich, C., Billino, J., Sterzer, P., Weidauer, S., Bernhardt, T., …Kleinschmidt, A. (2005). Effects of arousing emotional scenes on the distribution of visuospatial attention: Changes with aging and early subcortical vascular dementia. *Journal of the Neurological Sciences*, *229*, 109–116. doi:10.1016/j.jns.2004.11.007

Shipley, W. C. (1986). *Shipley Institute of Living Scale*. Los Angeles: Western Psychological Services.

Spielberger, C. D., Gor

Palo Alto, CA:

Wechsler, D. (1987). *W*

Corporation.

Wechsler, D. (1997). *T*

III. New York:

West, R. L. (1996). An

Psychological E

Williams, J. M., Mathe

psychopatholog

Wilson, B. A., Alderma

Behavioural As

England: Tham

Running head: EFFECTS OF AGE ON DETECTION OF EMOTION 22

Footnotes

Placement and format of footnotes, 2.12

[1] Analyses of covariance were conducted with these covariates, with no resulting influences of these variables on the pattern or magnitude of the results.

[2] These data were also analyzed with a 2 × 5 ANOVA to examine the effect of target category when presented only in arrays containing neutral images, with the results remaining qualitatively the same. More broadly, the effects of emotion on target detection were not qualitatively impacted by the distractor category.

Figure 2.1. Sample One-Experiment Paper (continued)

Table 1

Participant Characteristics

Measure	Younger group *M*	Younger group *SD*	Older group *M*	Older group *SD*	*F* (1, 46)	*p*
Years of education	13.92	1.28	16.33	2.43	18.62	<.001
Beck Anxiety Inventory	9.39	5.34	6.25	6.06	3.54	.066
BADS–DEX	20.79	7.58	13.38	8.29	10.46	.002
STAI–State	45.79	4.44	47.08	3.48	1.07	.306
STAI–Trait	45.64	4.50	45.58	3.15	0.02	.963
Digit Symbol Substitution	49.62	7.18	31.58	6.56	77.52	<.001
Generative naming	46.95	9.70	47.17	12.98	.004	.951
Vocabulary	33.00	3.52	35.25	3.70	4.33	.043
Digit Span–Backward	8.81	2.09	8.25	2.15	0.78	.383
Arithmetic	16.14	2.75	14.96	3.11	1.84	.182
Mental Control	32.32	3.82	23.75	5.13	40.60	<.001
Self-Ordered Pointing	1.73	2.53	9.25	9.40	13.18	.001
WCST perseverative errors	0.36	0.66	1.83	3.23	4.39	.042

Note. The Beck Anxiety Inventory is from Beck et al. (1988); the Behavioral Assessment of the Dysexecutive Syndrome—Dysexecutive Questionnaire (BADS-DEX) questionnaire is from Wilson et al. (1996); the State–Trait Inventory (STAI) measures are from Spielberger et al. (1970); and the Digit Symbol Substitution, Digit Span Backward, and Arithmetic Wechsler Adult Intelligence and Memory Scale–III measures are from Wechsler (1997). Generative naming scores represent the total number of words produced in 60 s each for letter *F*, *A*, and *S*. the Vocabulary measure is from Shipley (1986); the Mental Control measure is from Wechsler (1987); the Self-Ordered Pointing measure was adapted from Petrides and Milner (1982); and the Wisconsin Card Sorting Task (WCST) measure is from Nelson (1976). All values represent raw, nonstandardized scores.

Selecting effective presentation, 4.41; Logical and effective table layout, 5.08

Elements of table notes, 5.16

Running h

Table 2

Raw Resp

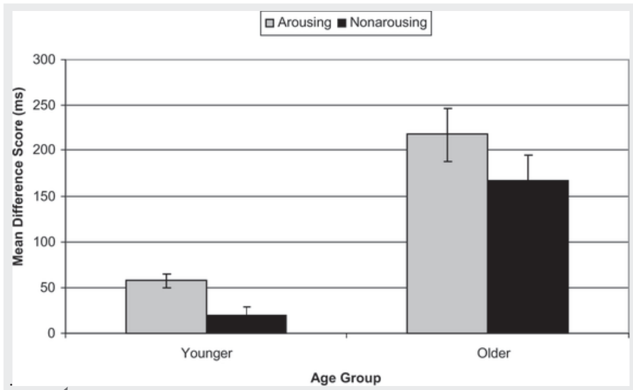
Categor
Positive
Positive
Neutral
Negativ
Negativ

Note. Va
of the sa
positive l
arousal, a
recorded

Figure 2.1. Sample One-Experiment Paper (continued)

Figure 1. Mean difference values (ms) representing detection speed for each target category subtracted from the mean detection speed for neutral targets. No age differences were found in the arousal-mediated effects on detection speed. Standard errors are represented in the figure by the error bars attached to each column.

Figure legends and captions, 5.23



Principles of figure use and construction, types of figures; standards, planning, and preparation of figures, 5.20–5.25

Figure 2.2. Sample Two-Experiment Paper (The numbers refer to numbered sections in the *Publication Manual*. This abridged manuscript illustrates the organizational structure characteristic of multiple-experiment papers. Of course, a complete multiple-experiment paper would include a title page, an abstract page, and so forth.)

Inhibitory Influences on Asychrony as a Cue for Auditory Segregation

Auditory grouping involves the formation of auditory objects from the sound mixture reaching the ears. The cues used to integrate or segregate these sounds and so form auditory objects have been defined by several authors (e.g., Bregman, 1990; Darwin, 1997; Darwin & Carlyon, 1995). The key acoustic cues for segregating concurrent acoustic elements are differences in onset time (e.g., Dannenbring & Bregman, 1978; Rasch, 1978) and harmonic relations (e.g., Brunstrom & Roberts, 1998; Moore, Glasberg, & Peters, 1986). In an example of the importance of onset time, Darwin (1984a, 1984b) showed that increasing the level of a harmonic near the first formant (F1) frequency by adding a synchronous pure tone changes the phonetic quality of a vowel. However, when the added tone began a few hundred milliseconds before the vowel, it was essentially removed from the vowel percept.….[section continues].

General Method ← Elements of empirical studies, 1.01

Overview

In the experiments reported here, we used a paradigm developed by Darwin to assess the perceptual integration of additional energy in the F1 region of a vowel through its effect on phonetic quality (Darwin, 1984a, 1984b; Darwin & Sutherland, 1984)….[section continues].

Stimuli

Amplitude and phase values for the vowel harmonics were obtained from the vocal-tract transfer function using cascaded formant resonators (Klatt, 1980). F1 values varied in 10-Hz steps from 360–550 Hz—except in Experiment 3, which used values from 350–540 Hz—to produce a continuum of 20 tokens….[section continues].

Listeners

Paper adapted from "Inhibitory Influences on Asychrony as a Cue for Auditory Segregation," by S. D. Holmes and B. Roberts, 2006, *Journal of Experimental Psychology: Human Perception and Performance*, *32*, pp. 1231–1242.

Figure 2.2. Sample Two-Experiment Paper (continued)

Running head: INHIBITORY INFLUENCES ON ASYCHRONY 2

Listeners were volunteers recruited from the student population of the University of Birmingham and were paid for their participation. All listeners were native speakers of British English who reported normal hearing and had successfully completed a screening procedure (described below). For each experiment, the data for 12 listeners are presented.…[section continues].

Plural forms of nouns of foreign origin, 3.19

Procedure

At the start of each session, listeners took part in a warm-up block. Depending on the number of conditions in a particular experiment, the warm-up block consisted of one block of all the experimental stimuli or every second or fourth F1 step in that block. This gave between 85 and 100 randomized trials.…[section continues].

Data Analysis

The data for each listener consisted of the number of /I/ responses out of 10 repetitions for each nominal F1 value in each condition. An estimate of the F1 frequency at the phoneme boundary was obtained by fitting a probit function (Finney, 1971) to a listener's identification data for each condition. The phoneme boundary was defined as the mean of the probit function (the 50% point).…[section continues].

Multiple Experiments, 2.09

Experiment 1

In this experime

pure-tone captor. Each

tone captor and a cente

continues].

Method

Running head: INHIBITORY INFLUENCES ON ASYCHRONY 3

There were nine conditions: the three standard ones (vowel alone, incremented fourth, and leading fourth) plus three captor conditions and their controls. A lead time of 240 ms was used for the added 500-Hz tone… [sectioncontinues].

Abbreviating units of measurement, 4.27, Table 4.4

Results and Discussion

Figure 4 shows the mean phoneme boundaries for all conditions and the restoration effect for each captor type. The restoration effects are shown above the histogram bars both as a boundary shift in hertz and as a percentage of the difference in boundary position between the incremented-fourth and leading-fourth conditions..…[section continues].

Experiment 2

This experiment considers the case where the added 500-Hz tone begins at the same time as the vowel but continues after the vowel ends…[section continues].

Method

There were five conditions: two of the standard ones (vowel alone and incremented fourth), a lagging-fourth condition (analogous to the leading-fourth condition used elsewhere), and a captor condition and its control. A lag time of 240 ms was used for the added 500-Hz tone…[section continues]

Policy on metrication, 4.39; Style for metric units, 4.40

Results and Discussion

Figure 2.2. Sample Two-Experiment Paper (continued)

1984; Roberts & Holmes, 2006). This experiment used a gap between captor offset and vowel onset to measure the decay time of the captor effect.…[section continues].

Method

There were 17 conditions: the three standard ones (vowel alone, incremented fourth, and leading fourth), five captor conditions and their controls, and four additional conditions (described separately below). A lead time of 320 ms was used for the added 500-Hz tone. The captor conditions were created by adding a 1.1-kHz pure-tone captor, of various durations, to each member of the leading-fourth continuum..…[section continues].

Results

Use of statistical term rather than symbol in text, 4.45

Figure 6 shows the mean phoneme boundaries for all conditions. There was a highly significant effect of condition on the phoneme boundary values, $F(16, 176) = 39.10, p < .001$. Incrementing the level of the fourth harmonic lowered the phoneme boundary relative to the vowel-alone condition (by 58 Hz, $p < .001$), which indicates that the extra energy was integrated into the vowel percept.…[section continues].

Discussion

The results of this experiment show that the effect of the captor disappears somewhere between 80 and 160 ms after captor offset. This indicates that the captor effect takes quite a long time to decay away relative to the time constants typically found for cells in the CN using physiological measures (e.g., Needham & Paolini, 2003).…[section continues].

Summary and Concluding Discussion

Darwin and Sutherland (1984) first demonstrated that accompanying the leading portion of additional energy in the F1 region of a vowel with a captor tone partly reversed the effect of the onset asynchrony on perceived vowel quality. This finding was attributed to the formation of

a perceptual group between the leading portion and the captor tone, on the basis of their common onset time and harmonic relationship, leaving the remainder of the extra energy to integrate into the vowel percept…[section continues].

[Follow the form of the one-experiment sample paper to type references, the author note, footnotes, tables, and figure captions.]

Figure 2.3. Sample Meta-Analysis (The numbers refer to numbered sections in the *Publication Manual*. This abridged manuscript illustrates the organizational structure characteristic of reports of meta-analyses. Of course, a complete meta-analysis would include a title page, an abstract page, and so forth.)

Running head: THE SLEEPER EFFECT IN PERSUASION 1

The Sleeper Effect in Persuasion:

A Meta-Analytic Review

Persuasive messages are often accompanied by information that induces suspicions of invalidity. For instance, recipients of communications about a political candidate may discount a message coming from a representative of the opponent party because they do not perceive the source of the message as credible (e.g., Lariscy & Tinkham, 1999). Because the source of the political message serves as a discounting cue and temporarily decreases the impact of the message, recipients may not be persuaded by the advocacy immediately after they receive the communication. Over time, however, recipients of an otherwise influential message may recall the message but not the noncredible source and thus become more persuaded by the message at that time than they were immediately following the communication. The term *sleeper effect* was used to denote such a d

noncredible source) be

memory of the message

Italicize key terms, 4.21

Sample of Studies

We retrieved re

means of multiple proc

(1887–2003), Dissertati

Social-Science-Citation

credibility, *source cred*

persistence, *attitude m*

Running head: THE SLEEPER EFFECT IN PERSUASION 2

retention, *attitude and decay*, and *persuasion and decay*. Because researchers often use the terms *opinion* and *belief*, instead of *attitude*, we conducted searches using these substitute terms as well.

Second, …..[section continues].

Description of meta-analysis, 1.02; Guidelines for reporting meta-analysis, 2.10; see also Appendix

Selection Criteria

We used the following criteria to select studies for inclusion in the meta-analysis.

1. We only included studies that involved the presentation of a communication containing persuasive arguments. Thus, we excluded studies in which the participants played a role or were asked to make a speech that contradicted their opinions. We also excluded developmental studies involving delayed effects of an early event (e.g., child abuse), which sometimes are also referred to as sleeper effects….[section continues].

Moderators

Identification of elements in a series within a sentence, 3.04

For descriptive purposes, we recorded (a) the year and (b) source (i.e., journal article, unpublished dissertations and theses, or other unpublished document) of each report as well as (c) the sample composition (i.e., high-school students, university students, or other) and (d) the country in which the study was conducted.

We also coded each experiment in terms of ….[section continues].

Studies were coded independently by the first author and another graduate student.

Figure 2.3. Sample Meta-Analysis (continued)

Running head: THE SLEEPER EFFECT IN PERSUASION 3

was satisfactory (Orwin, 1994). We resolved disagreements by discussion and consultation with colleagues. Characteristics of the individual studies included in this review are presented in Table 1. The studies often contained several independent datasets such as different messages and different experiments. The characteristics that distinguish different datasets within a report appear on the second column of the table.

Dependent Measures and Computation of Effect Sizes

We calculated effect sizes for (a) persuasion and (b) recall–recognition of the message content. Calculations were based on the data described in the primary reports as well as available responses of the authors to requests of further information….[section continues].

Analyses of Effect Sizes

There are two m

effects.…[section conti

To benefit from the str

conduct analyses using

The data analys

estimation of overall ef

Sample of Studies and

Descriptive cha

Table 2.…[section cont

Overview of the Avera

A thorough und

condition differences a

Running head: THE SLEEPER EFFECT IN PERSUASION 4

Use at least two subheadings in a section, 3.02

place over time.…[section continues].

In light of these requirements, we first examined whether discounting cues led to a decrease in agreement with the communication (boomerang effect). Next,…[section continues].

Ruling out a nonpersisting boomerang effect. To determine whether or not a delayed increase in persuasion represents an absolute sleeper effect, one needs to rule out a nonpersisting boomerang effect, which takes place when a message initially backfires but later loses this reverse effect (see panel A of Figure 1).…[section continues].

Average sleeper effect. Relevant statistics corresponding to average changes in persuasion from the immediate to the delayed posttest appear in Table 4, organized by the different conditions we considered (i.e., acceptance-cue, discounting-cue, no-message control, and message-only control). In Table 4, positive effect sizes indicate increases in persuasion over time, negative effect sizes indicate decay in persuasion, and zero effects denote stability in persuasion. Confidence intervals that do not include zero indicate significant changes over time. The first row of Table 4 shows that recipients of acceptance cues agreed with the message less as time went by (fixed-effects, $d_+ = -0.21$; random-effects, $d_+ = -0.23$). In contrast to the decay in persuasion for recipients of acceptance cues, there was a slight increase in persuasion for recipients of discounting cues over time ($d_+ = 0.08$). It is important to note that change in discounting-cue conditions significantly differed from change in acceptance-cue conditions, (fixed-effects; $B = -0.29$, $SE = 0.04$), $Q_B(1) = 58.15$, $p < .0001$; $Q_E(123) = 193.82$, $p < .0001$.…[section continues].

Summary and variability of the overall effect. The overall analyses identified a relative sleeper effect in persuasion, but no absolute sleeper effect. The latter was not surprising, because the sleeper effect was expected to emerge under specific conditions.…[section continues].

Figure 2.3. Sample Meta-Analysis (continued)

Running head: THE SLEEPER EFFECT IN PERSUASION 5

Moderator Analyses

Although overall effects have descriptive value, the variability in the change observed in discounting-cue conditions makes it unlikely that the same effect was present under all conditions. Therefore, we tested the hypotheses that the sleeper effect would be more likely (e.g., more consistent with the absolute pattern in Panel B1 of Figure 1) when…[section continues].

Format for references included in a meta-analysis with less than 50 references, 6.26

Running head: THE SLEEPER EFFECT IN PERSUASION 6

References

References marked with an asterisk indicate studies included in the meta-analysis. The in-text citations to studies selected for meta-analysis are not preceded by asterisks.

Albarracín, D. (2002). Cognition in persuasion: An analysis of information processing in response to persuasive communications. In M. P. Zanna (Ed.), *Advances in experimental social psychology* (Vol. 34, pp. 61–130). San Diego, CA: Academic Press.…[references continue]. doi:10.1016/S0065-2601(02)80004-1

Johnson, B. T., & Eagly, A. H. (1989). Effects of involvement in persuasion: A meta-analysis. *Psychological Bulletin, 106,* 290–314.doi:10.1037/0033-2909.106.2.290

*Johnson, H. H., Torcivia, J. M., & Poprick, M. A. (1968). Effects of source credibility on the relationship between authoritarianism and attitude change. *Journal of Personality and Social Psychology, 9,* 179–183. doi:10.1037/h0021250

*Johnson, H. H., & Watkins, T. A. (1971). The effects of message repetitions on immediate and delayed attitude change. *Psychonomic Science, 22,* 101–103.

Jonas, K., Diehl, M., & Bromer, P. (1997). Effects of attitudinal ambivalence on information processing and attitude-intention consistency. *Journal of Experimental Social Psychology, 33,* 190–210. doi:10.1006/jesp.1996.1317. . . [references continue].

[Follow the form of the one-experiment sample paper to type the author note, footnotes, tables, and figure captions.]