

Age-related deficits in working memory WM span performance have consistently been demonstrated across many span tasks (Salthouse, 1994; for an exception, see May, Hasher, & Kane, 1999). Moreover, these deficits may contribute to age-related declines in performance on other cognitive measures (Salthouse & Babcock, 1991). This reason, in particular, has motivated many of the studies aimed at understanding age-related differences in span performance. Some of the most popular explanations involve a general cognitive process being compromised with age. In the current paper, we briefly discuss one of the leading general process theories in the WM and aging literature – the processing speed account (for an alternative account, see Hasher & Zacks, 1988). Afterwards, we present a complementary hypothesis about age differences in the use of effective strategies on span tasks.

Processing Speed Account

The processing speed account states that many cognitive processes are dependent upon the

adults than older adults produce effective strategies on a free recall task (see also Zivian & Darjes, 1983). Older adults are also less likely to spontaneously use verbal or imaginal mediators for associative memory tests (

“other.” After the RSPAN task, participants completed a demographics questionnaire, the letter comparison task, the pattern comparison task, and the vocabulary knowledge task, in that order.

Results

We first report overall RSPAN performance to demonstrate that age-related deficits occurred, and then we report span performance as a function of strategy use. Most important, to assess the strategy-deficit hypothesis, we present the proportion of each strategy that participants reported using and the degree to which production deficiencies can account for age-related variance in span performance.

RSPAN Performance—Overall performance on the RSPAN task was computed using partial-credit unit scoring, which is the mean proportion of correctly-recalled words not weighted by set size (for details, see Conway et al., 2005). As expected, age-related differences

older adults reported using them on approximately .34 of the trials, $t(50) = .93$, $p = .18$, $d = .26$. The direction of the effect favored older adults, ruling out the strategy-deficit hypothesis in its most general form.

Averaged across trials and participants, young and older adults have similar proportions of

Experiment 2

Again, analyses of span performance as a function of effective strategy use and set size yielded a reliable main effect of set size, RSPAN: $F(1,40) = 64.76, p < .001, \eta^2 = .62$, OSPAN: $F(1,27) = 22.16, p < .001, \eta^2 = .45$, indicating that participants perform significantly better on smaller (RSPAN = .81; OSPAN = .91) as compared to larger set sizes (RSPAN = .58; OSPAN = .69).

F_{no}
 (2= 76855j 0 -12 Td(Tj/F4 10 Tw 3.33008 0 TSEM(2) Tj/F3 10 T19.4384809 0

the age-related variance in WM span performance. For instance, when they reported using normatively effective strategies, older adults obtained almost the same levels of span performance as did young adults, which suggests that both groups are just as effective at retrieving and decoding their mediators. Moreover, in contrast to paired-associate tasks that have relatively long retention intervals between encoding and test trials, mediators are unlikely to be forgotten. For a correlated-decision span task, when the retention interval is minimal, older adults obtain almost the same levels of span performance as do young adults.

p. In Experiment 1, Pearson

Dunlosky J, Hertzog C. Measuring strategy production during associative learning: The Relative Utility of Concurrent versus Retrospective Reports. *Memory & Cognition* 2001;29:247–253.

Dunlosky J, Hertzog C, Powell-Moman A. The contribution of mediator-based deficiencies to age differences in associative learning. *Developmental Psychology* 2005;41:389–400. [PubMed: 15769194]

Salthouse TA, Babcock RL. Decomposing adult age differences in working memory. *Developmental Psychology* 1991;27:763–776.

Touron, DR.; Oransky, N.; Meier, ME.; Hines, JC. Poster presented at the 2007 Meeting of the Psychonomic Society. Long Beach, CA: 2007. Does metacognitive monitoring influence age , Babcock RL. Decomposing adus ; u8255?776.Tnalingthe

Effectiveness of Infection

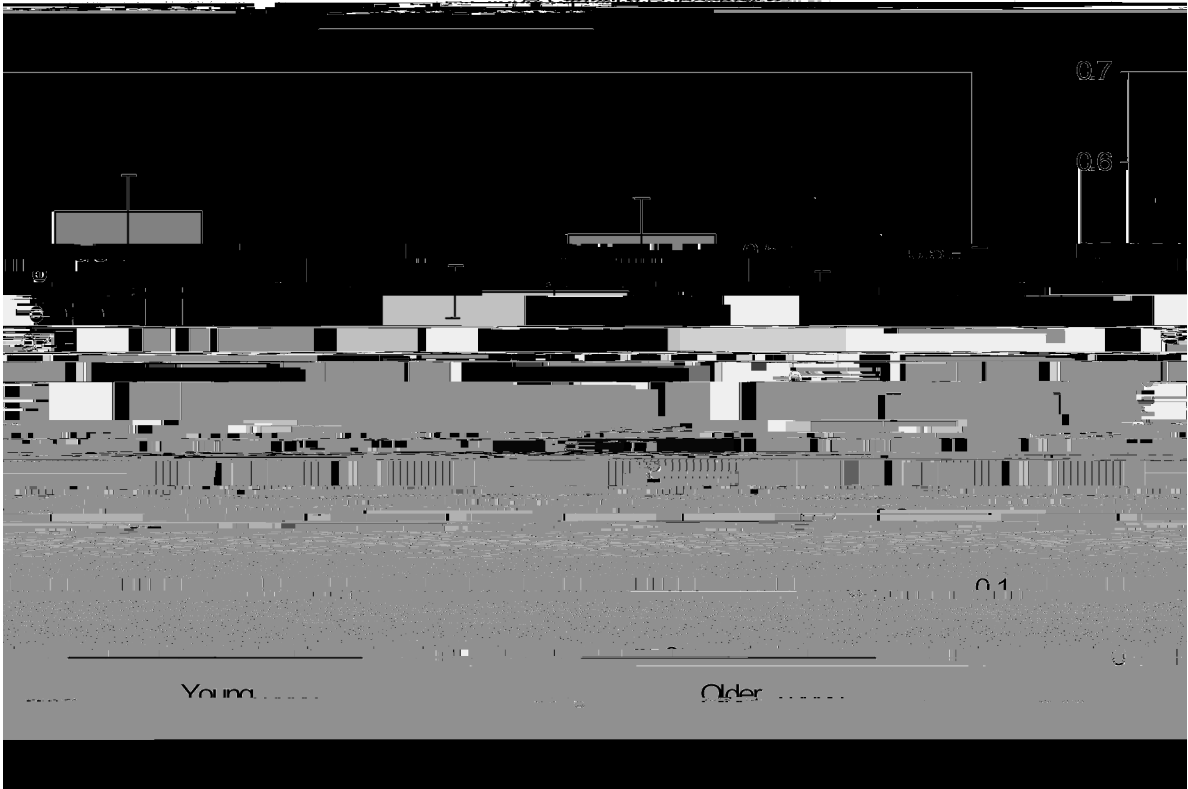




Figure 2. Mean proportion correct on the OSPAN task (top panel) and the RSPAN task (bottom panel) as a function of normatively effective strategies (Effective) and less effective strategies (Ineffective) for young and older adults in Experiment 2. Error bars represent the standard errors of each mean.



Table 6

Table 7
Proportion of Reported Strategy Use in Memory Tasks for Experiment 2

	Read	Repeat	Imagery	Sentence	Group	Other
RSPAN						
Young	.13 (.03)	.47 (.05ne-.13 (.03)				