Low Control Beliefs as a Risk Factor for Memory: Anxiety and Cognitive Interference as Mediators

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BACKGROUND
- There is robust evidence for individual differences in memory performance in middle and later adulthood (Hertzog, Kramer, Wilson, & Lindenberger, 2000; Sahlinhouse, 2000).
- Personal control beliefs have been found to play a central role in maintaining and optimizing cognitive health in adulthood and old age (Craik & Byrd, 2002; Hertzog et al., 2002; Kivisto, 2007; Lachman, Sprecher, & Pearman, 2006; Rose & Kohn, 1988; Sprecher, McKonis, Merrill, Albert, & Raudf, 1989; Windus & Anxiety, 2008).
- Control beliefs have behavioral, motivational, cognitive, affective, and physiological consequences, which in turn impact a large spectrum of age-related outcomes, such as cognitive performance and physical health (Lachman, Neupert, & Agnifian, 2011; Miller & Lachman, 2009).

HYPOTHESES
- We predicted a three-path mediational model: those with lower control beliefs would experience higher levels of state anxiety, and anxiety would impair memory performance by increasing the likelihood of intrusive thoughts.
- We also examined whether the hypothesized relationships would show variations by age, as past research has shown age differences (e.g., May, Hether, & Korn, 1990; Stetsi et al., 2006).

METHOD
- PARTICIPANTS: 152 adults recruited from a probability sample (Survey Sampling International).
- Area: West suburban Boston
- Exclusion criteria: poor self-rated health (compared to other people the same age), low level of education attainment (no high school degree or General Education Diploma), history of stroke in the last five years, serious head injury, Parkinson’s disease, or other neurological disorders.
- Non-native English speakers or those who learned English after age 10.
- More than two errors on the Pfeiffer Short Portable Mental Status Questionnaire (1975).
- Respondents with complete data: N = 149.

MEASURES

RESULTS
- The three paths of interest (ß control beliefs, ß task interference) were significant.
- The total effect of control beliefs on memory was significant in the model adjusting for age, sex, and verbal abilities (ß = 2.2, b(144) = 3.05; p = .003), but was non-significant in Model 3 when the mediators were included (direct effect: ß = .12, b(142) = 1.59, p = .115).
- The total indirect effect (i.e., control beliefs × task interference × episodic memory score) was significant (95% CI [.005, .498]), providing evidence for full mediation.

DISCUSSION
- The results provided empirical support for the theoretically driven three-path mediation model: participants with lower control beliefs reported higher levels of state anxiety, which in turn increased the likelihood of distracting thoughts during the memory tasks.
- This model held across age and while controlling for verbal abilities, education, and sex.
- Implications:
- Results can be useful for informing interventions to prevent, remediate or minimize either the decrements in sense of control or the sequelae involving anxiety and rumination.
- We suggest supplementing traditional strategy training with enhancement of control beliefs and reduction of fear and anxiety to achieve more sustained effects, especially for the most cognitively vulnerable populations, that is the older adults and those with low control beliefs.

LIMITATIONS & FUTURE DIRECTIONS
- Future studies will include concurrent, behavioral measures of task interference.
- An experimental design will also be helpful for examining directionality and causality for the established associations.