Beyond Traditional Models of Theory of Mind in Normal Aging: The Modifying Influence of Blood Pressure

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Theory of Mind (ToM)
- Ability to understand and reason about one’s own or others’ mental states.
  - Reliable age reductions in ToM [1,2].
- Underlying neurocognitive resources support ToM:
  - Memory, executive functions, & speed.
  - Cannot fully account for ToM performance [1].
- Can age-associated health modifiers account for weaker ToM abilities in late life?

Blood Pressure (BP) & Cognitive Aging
- BP = important marker of vascular aging. Associated with:
  - Cardiovascular morbidity and mortality.
  - Earlier/accelerated cognitive decline [3].
- Predicts and modifies performance:
  - Learning & memory, attention, executive function, speed [3].
- Not previously studied in the context of ToM.
- Three common indicators. Differential associations with age:
  - SBP
  - DBP
  - PP

STUDY OBJECTIVES

1. Does BP independently predict older adults’ ToM, beyond age and neurocognitive performance?
2. Does BP interact with neurocognitive performance to predict older adults’ ToM ability?

Participants
- N = 66 community-living older adults (59% female).
  Inclusion: English fluency; adequate vision & hearing; education ≥ grade 6.
  Exclusion: MMSE ≤ 24; significant head injury; psychotic illness; concurrent illness affecting cognition.

Results
- Hierarchical regression analyses, correcting for type 1 error.

(1) SBP uniquely predicted ToM, controlling for age & NP.

Table 1. Demographic characteristics and sample composition. Age & education presented in years.

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<th>Measure</th>
<th>Domain</th>
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<tr>
<td>CVLT - Long Delay</td>
<td>Verbal Memory</td>
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<tr>
<td>WAIS-III Letter-Number Sequencing</td>
<td>Working Memory</td>
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<td>WAIS-III Coding</td>
<td>Processing Speed</td>
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<td>D-KEFS Trail Making C</td>
<td>Cognitive Flexibility</td>
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<td>D-KEFS Color-word Interference</td>
<td>Inhibitory Control</td>
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<td>Pulse Pressure = PP (SBP - DBP)</td>
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Measure Neurocognitive
- Domains implicated in existing ToM models.
  - PCA: 1-factor Neurocognitive Performance (NP).
    - Comprised 5 tasks (56% variance):
      - ToM associations with associated health predictors.

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CONCLUSIONS

BP (esp. PP) important and previously unrecognized modifier of ToM-cognition associations.
- Especially in older adults with BP.
- Cognitive aging alone cannot fully explain age reductions in ToM ability [see also 1].
- Future models of ToM in aging should incorporate age-associated health predictors.

Select References

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Figure 1. Moderation effect of high PP in relation to ToM. Low-normal PP group: n = 44, PP range = 31-59. High PP group: n = 22, PP range = 60-96.