How does cognitive reserve impact on the relationships between mood, rumination, and cognitive function in later life?

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Background

• 30% of the population of Europe is expected to be aged over 65 by 2030 (Giannakouris, 2010).

• With age there is often a decrease in cognitive ability even in those older people deemed healthy (Salthouse, 2009; Singh-Manoux et al. 2012).

• Cognitive decline can affect quality of life making it important to consider modifiable factors that can help maintain cognition.
Modifiable variables related to cognition

• Depression and anxiety have both been related to reduced cognitive function in healthy, community-dwelling older people (Reppermund et al., 2011; Beirman et al., 2005; Gallacher et al., 2009).

• Rumination is a thinking styles associated with lowered mood and has been related to cognitive dysfunction in certain domains (Davis & Nolen-Hoeksema, 2000).
Cognitive reserve (CR)

- Cognitive reserve is “the capacity of the brain to resist the expression of symptoms in the face of existing neuropathology” (Snowdon, 2003).
- CR is most frequently indexed by educational level, occupational complexity, engagement in cognitively-stimulating leisure activities, or a combination of these.
Mood, CR, and cognitive function

- Lowered mood and lower CR are related to reduced cognitive ability but what about lowered mood and cognitive function in those with higher cognitive reserve?

- Existing research on the role of cognitive reserve in the relationship between mood and cognitive function is limited and has reported varied results (Avila et al., 2009; Bhalla et al., 2005; O’Shea et al., 2014).
Aims

To assess:


2. Whether the relationships between depressive symptoms, anxiety, rumination and cognitive function differ between people with low and high levels of cognitive reserve in later life.
Method

• Design
  - Cross sectional survey design with a short neuropsychological assessment

• Sample
  - 236 community-dwelling people over 60

• Procedure
  - Participants were met at home or community setting.
Results

• There were 236 participants, 146 females and 90 males with a mean age of 70.9 (SD = 7.66)

• Descriptive statistics indicated that on average participants had:
  - low levels of rumination, anxiety, and depression
  - and scored well on immediate and delayed recall tasks, and the test of verbal fluency.
Results Aim 1

- To assess the association between mood, rumination, CR and cognition.
- CR, depressive symptoms, anxiety, and rumination together accounted for between 13% and 15.6% of the variance in cognition.
- CR was an independently significant predictor for immediate recall ($\beta = .285$), delayed recall, ($\beta = .311$), and verbal fluency ($\beta = .364$)
- Depressive symptoms were an independently significant predictor for immediate ($\beta = -.186$) and delayed ($\beta = -.215$) recall
Results Aim 2

• To assess if the associations differed in those with low and high CR the sample was split at the CR median.

• There were significant negative correlations between depressive symptoms and all three cognitive tests ($r = -0.23$ to $-0.30$) and anxiety and immediate and delayed recall ($r = -0.19$ to $-0.23$) in the group with lower CR but not in the group with higher CR.

• Multiple regression – depressive symptoms, anxiety, and rumination accounted for a significant amount of variance for all cognitive tests (8.2% - 8.8%) in the low CR but not high CR groups.
Discussion

• Cognitive reserve and depressive symptoms showed the most consistent associations with cognitive function.

• The results also indicate that depressive symptoms and anxiety have different relationships with cognitive function in those with low and high cognitive reserve.
Limitations and Direction for Future Research

• The levels of depressive symptoms and anxiety were low in this community-dwelling sample.

• The study was cross-sectional and so can only show associations between CR, depressive symptoms, anxiety, and rumination, and cognitive function.
Conclusion

• Having higher CR appeared to mitigate the association between depressive symptoms, anxiety, and cognitive function in this sample.

• These results would support the view that it is important to continue to build on CR, which is a fluid construct, in order to maintain cognitive health in later life.
Thank you for your time

Any Questions?
Measures information

• **The Ruminative Response Scale** (Rewston, Clark, Moniz-Cook, & Waddington, 2007) consists of ten self-report items that assess two elements of rumination: brooding and reflection.

• **The Hospital Anxiety and Depression Scale** (HADS; Zigmond & Snaith, 1983) is a 14-item self-rating questionnaire assessing levels of depression and anxiety, with 7 depression items and 7 anxiety items.

• For the memory assessment both immediate and delayed recall tasks of the Rivermead Behavioural Memory Test (Wilson, Cockburn, & Baddeley, 2003) short story recall subtest were used. This is a highly sensitive, ecological test of memory impairment, which is designed to predict everyday memory problems in participants. The **FAS Phonemic Fluency Test** (Spreen & Strauss, 1991) was used to assess phonemic fluency as a measure of executive function.

• **The Lifetime of Experiences Questionnaire** (LEQ; Valenzuela and Sachdev, 2007). assesses cognitive reserve across three life stages (young adulthood, mid-life and late life) and covers both specific and non-specific mental activity. Higher scores indicate greater cognitive reserve. What is the range of scores?
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<th>Mean</th>
<th>SD</th>
<th>Min.</th>
<th>Max.</th>
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<td>Rumination</td>
<td>16.33</td>
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Correlations for the low and high CR groups

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<th>Delayed recall</th>
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<th>Anxiety</th>
<th>Ruminate</th>
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<td>.153</td>
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