Objectivity and Subjectivity in Cognitive Decline: A Qualitative Study of Concerns and Complaints in Older Adults

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Subjective Cognitive Decline (SCD)

- Clinical and research efforts are increasingly focused on identifying early predictors of Alzheimer's disease (AD) and other dementia

- SCD has shown promise as one such early indicator
  - SCD: self-reported declines in cognitive function despite objective test performance within normal limits.
  - Up to 60% of those with SCD may develop objective pathological cognitive decline.

- However, SCD has been difficult to establish as a reliable predictor for several reasons

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SCD Challenges

- SCD is nonspecific and multidetermined
  - It is difficult to determine when and for whom SCD may indicate pathological cognitive decline/

- SCD research relies on a variety of conceptualizations and definitions across diverse populations (e.g. clinical vs. community-based)
  - It has proven difficult to reconcile findings across studies to build a coherent clinical understanding of predictive potential.

- Multiple methods have been used to study SCD, but each in isolation from one another.
  - It has been challenging to build a full and comprehensive understanding.

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Overall Research Aims

- To examine the specific characteristics of healthy older adults who may be at increased risk of developing objective cognitive decline in the future

- To create a bridge between various sources of clinical information
    - To identify areas of convergence/divergence between quantitative, qualitative, and genetic data

- To identify potential key items/considerations for effective early dementia screening and streaming of clinical services

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Variables of Interest

- Subjective cognitive decline (SCD)
  - SCD-*Plus* criteria (Jessen et al., 2014)
  - Single-question: "Are [these] changes to your memory or any other thinking abilities concerning to you?"

- Subtle cognitive decline (subtle CD)
  - Amended Edmonds et al. (2015) criteria
  - Exclusionary criteria: Considered to have MCI when >50% of scores within a given cognitive domain fell >1 standard deviation below the age-normative mean.

- APOE ε4 genotype
  - Based on saliva sample and qPCR analysis

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Participants

- Eligibility
  - 65+ years of age
  - No history of brain injury, neurological condition, dementia
  - Living independently in the community
  - Unimpaired performance on MATS and MMSE-2

- Sample (*n*=65)
  - Healthy Control (SCD-/Subtle CD-)   *n*=27
  - SCD Only (SCD+/Subtle CD-)   *n*=13
  - Subtle CD Only (SCD-/Subtle CD+)   *n*=16
  - Highest Risk (SCD+/Suble CD+)   *n*=9
  - 78.5% female
  - Professionals and academics

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Data Collection

- Telephone screening
  - Demographics, Medical Hx, MATS (Rabin et al., 2007)

- Neuropsychological assessment
  - Similar to ADNI dataset

- Qualitative interview
  - Questions regarding experiences with aging and cognition

- Saliva sample collection (APOE genotype)

- Qualitative member check

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Study 1 – Determining the Relationship between SCD and Subtle CD

- Objectives
  1. Isolate the specific factors that contribute most to SCD endorsement.
  2. Clarify whether and to what extent SCD endorsement and APOE ε4 genotype predict objective cognitive performance (i.e., subtle CD).

- Analysis
  - Binary logistic regression, forward entry.
  - Predictors:
    - 1) APOE ε4 genotype*; 2) Age; 3) Sex; 4) Education; 5) Family w/ dementia; 6) Psychological Dx; 7) Self-reported word-finding (MATS); 8) ECog Memory total; 9) ECog Organization total; 10) ECog Divided Attention total; 11) CCI; 12) GDS; 13) UCLA Loneliness Scale; 14) AMAS-E Worry/Oversensitivity total; 15) AMAS-E Physiological Anxiety total; 16) AMAS-E Fear of Aging total; 17) AMAS-E Lie Scale total; 18) AMAS-E General Anxiety total; 19) SCD/Subtle CD.

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Study 1 – Results

- APOE genotype exclusion

- **Subtle CD Predictive Model**
  1. ECog planning (p=.004)
  2. GDS total (p=.007)*
  3. AMAS-E physiological anxiety (p=.015)

- Accuracy 78.5%; Nagelkerke R^2=0.34

- **Subtle CD-Prone Profile**
  - **Anxiety re: to health and physical fxn**
  - **Lower self-reported planning vs. peers**
  - ***Lower* depressive symptoms vs. peers**

- **SCD Predictive Model (Final)**
  1. AMAS-E fear of aging (p=.006);
  2. Self-endorsed word-finding (p=.028)
  3. CCI total (p=.035)

- Accuracy 76.9%; Nagelkerke R^2=0.50

- **SCD-Prone Profile**
  - **Anxiety re: age-related changes**
  - **Self-perceived cognitive declines**

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Study 1 – Summary

- SCD, Subtle CD represented orthogonal sources of variance

- SCD may relate more to attunement to cognitive change and anxiety regarding the (anticipated) development of objective cognitive decline.

- Subtle CD may relate more to concerns regarding loss of independence, mitigating visibility and threat of declines.

- Episodic Memory was not identified as a key predictor; EF arose as a significant indicator of Subtle CD.

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Study 2 – Exploring qualitative aspects of SCD and Subtle CD

- Objectives
  1. To determine which qualitative experiences may arise most frequently for older adults.
  2. To determine the relationship between SCD, subtle CD (objective cognitive performance), and the endorsement of specific qualitative experiences.

- Analysis
  - Transcribed interview data was coded across cases.
  - Codes were agglomerated into Categories.
  - Codes and Categories were coded as present or absent per participant.
  - MANOVA and Mann-Whitney *U* tests were conducted to determine the association between Category endorsement and SCD, Subtle CD
    - Specific Coded content was not analyzed directly due to low *n*.

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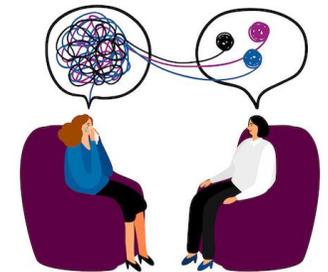
Study 2 – Levels of qualitative data
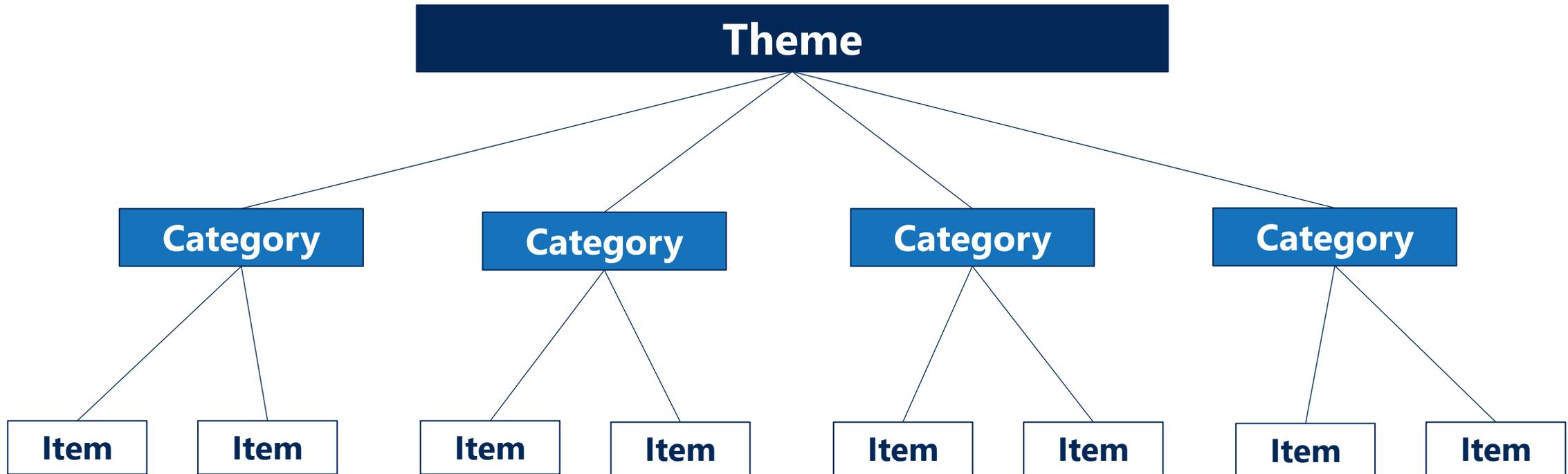
Study 2– Category-Level Results

- Omnibus Effects
  - No significant effects of SCD (Wilks' λ=.729, p=.181) or Subtle CD (Wilks' λ=.781, p=.369).

- Theme 1: Cognitive Change
  - SCD endorsed *more* EF declines (p<.010) and overall declines (p<.040) vs. unconcerned.
  - Subtle CD reported *fewer* EF declines vs. Healthy Controls (p<.023).

- Theme 2: Behavioural Change
  - SCD endorsed *more* Increasing Exposure strategies (p=.005) and overall strategy use (p<.000) vs. unconcerned.
  - Trending increase in Anticipating Decline strategies among SCD vs. unconcerned (p=.054).
  - No effect of Subtle CD on Behavioural Change category endorsement.

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Study 2 – Summary: Category-level

- Both SCD and Subtle CD were associated with the endorsement of EF declines, though in *opposing* directions.
  - These findings may reinforce the findings of Study 2.

- Increasing Exposure strategies were uniquely associated with SCD.
  - These strategies may be more readily employed, covert, and/or necessary for daily functioning.

- SCD may reflect the downstream effects of fluid reasoning/EF changes more than other cognitive declines.

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Study 2 – Item-Level Effects

- Theme 1: Cognitive Change
  - SCD X Subtle CD endorsed effortful attention *less* vs. SCD alone (p=.010).
  - SCD X Subtle CD reported losing track of conversational topic *more* vs. SCD alone (p=.049).
  - SCD X Subtle CD reported declines in memory for conversation *more* vs. SCD alone (p=.025) or Subtle CD alone (p=.014).
  - SCD X Subtle CD reported declines in (executive) sequencing *more* vs. SCD alone (p=.025) or Subtle CD alone (p=.014).

- Theme 2: Behavioural Change
  - SCD was endorse using mental rehearsal strategies *more* vs. Unconcerned (p=.009).

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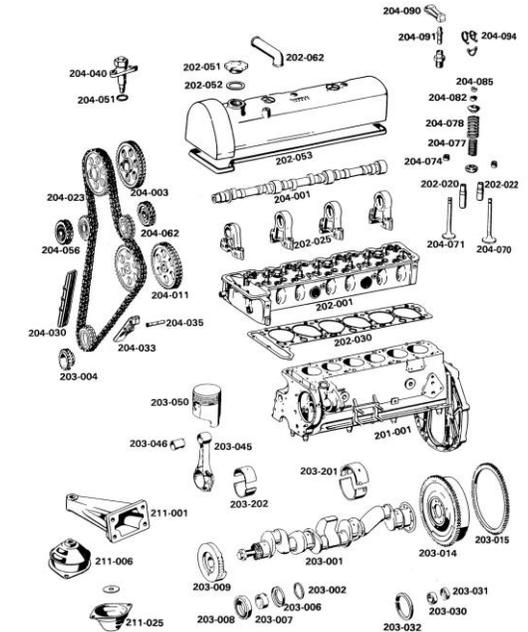
Study 2 – Summary: Item-level

- Findings indicated fluid reasoning/EF decrements
  - Aligns with previous work identifying "distractible speech" as a predictor (Miebach et al., 2018).
  - Aligns with previous work identifying "difficulty keeping up with conversation" as a predictor (Amariglio et al., 2011).

- We did not find any effect of visuospatial processing deficits
  - Conflicts with previous work identifying "orientation/navigation" as a predictor (Amariglio et al., 2011).

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Discussion: Implications

- SCD and Subtle CD represent distinct entities
  - SCD relates more reliably to psychosocial factors; Subtle CD may relate more to EF change and the visibility of cognitive declines.
  - Linear progression from SCD → Subtle CD → objective impairment is questionable.

- Strong likelihood that discussion of cognitive change will elicit biased responding in older adults (particularly those feeling threatened).
  - Those with SCD may be eager to disclose while those with Subtle CD may be reticent.
  - Due to association with AD, memory declines may be disclosed less openly than EF.
  - Fears regarding loss of independence may undermine disclosure.

- Executive Functioning – not episodic memory – may prove to be the most sensitive domain to early cognitive decrements.

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Discussion: Limitations

- Low *n* precluded APOE ε4 genotype inclusion and may have contributed to underpowered statistical analyses.

- Participants tended toward a more abstract interpretation of SCD (concern) than previous work.

- Theoretically-driven conceptualization of Subtle CD.

- Self-selected sample.

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Discussion: Future Directions

- Large-scale longitudinal studies comparing mixed-methods data across time points.

- Cross-sectional studies comparing (reported) cognitive and behavioural changes in SCD, Subtle CD, and objectively impaired samples.

- Larger and more diverse samples (e.g., ethnicity, sex, gender, SES status, setting, etc.).

- Inclusion of informant reports and biomarker data.

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