

Do episodic & semantic autobiographical memory contribute to self-continuity?

Evidence of preserved narrative identity over time in episodic amnesia

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Background

- Both episodic and semantic forms of autobiographical memory (AM) are argued to be associated with the formation and maintenance of our self-continuity¹.
 - Narrative continuity*, which is based on life stories, is thought to depend more on semantic AM than episodic, but episodic AM may still contribute to some aspects (e.g., autobiographical reasoning)².
- How does episodic amnesia impact narrative continuity?**
- Multiple measures of narrative continuity examined in 3 cases of episodic amnesia.
- Hypotheses:**
- The narrative continuity of the cases will be impaired in terms of **autobiographical reasoning**, since it is thought to depend on episodic AM.
 - The narratives of cases will **differ textually** from those of controls.

PARTICIPANTS

Demographics:

Cases	BL	DA	DG
Age (years)	58	68	54
Education (years)	13	17	16
Aetiology	Hypoxia-ischemia	HSE*	Anoxia
Age of Onset	25	42	45
Medial Temporal Lobe (MTL) Damage	Selective bilateral lesions (dentate gyrus & partial CA3)	Extensive damage to extended MTL	No MRI; MTL damage presumed
Anterograde Memory	Mild	Severe	Severe
Retrograde Memory	Moderate	Moderate	Temporally graded
Semantic Memory	Preserved	Preserved	Relatively Preserved

Controls (N = 19)

	Range	M	SD
Age (years)	53-73	63	7
Education (years)	12-20	16	2

*HSE = Herpes simplex encephalitis

PROCEDURE

Self-Continuity Interview (SCI)^{3, 4}

Three questions capturing **diachronic unity** – the conviction that despite change one continues to be the same person over time

- Perceived continuity:** *Do you feel like the same person as in your 20's*
 - Y/N
- I-self & Me-self continuity:** *In what ways are you the same or changed?*
 - Number of I-self & Me-self statements in responses
 - Statements scored from 1 (fundamental change) to 3 (no change)
- Continuity explanation:** *Explain how one and the same person can act in many different ways but still be the same person*
 - Sophistication of responses scored from 1 (simple/least complex) to 5 (revisionist/most complex)

Life Story Interview (LSI)^{5, 6} Recall your life story, from birth to present

Measures of **autobiographical reasoning** evident in narratives

- Number of **self-event (SE) connections** identified:
 - SE Change:** an event that impacted self
 - SE Stability:** self caused or illustrated by an event
- Narrative arc** quantified using text analyses from LIWC⁷
 - Staging:** text used to set up the story
 - Plot progression:** text relating to people and their actions
 - Cognitive tension:** text indicating “working-through” of issues

Statistical Analyses: Crawford’s Bayesian Single-Case Method (with age as a covariate)⁸

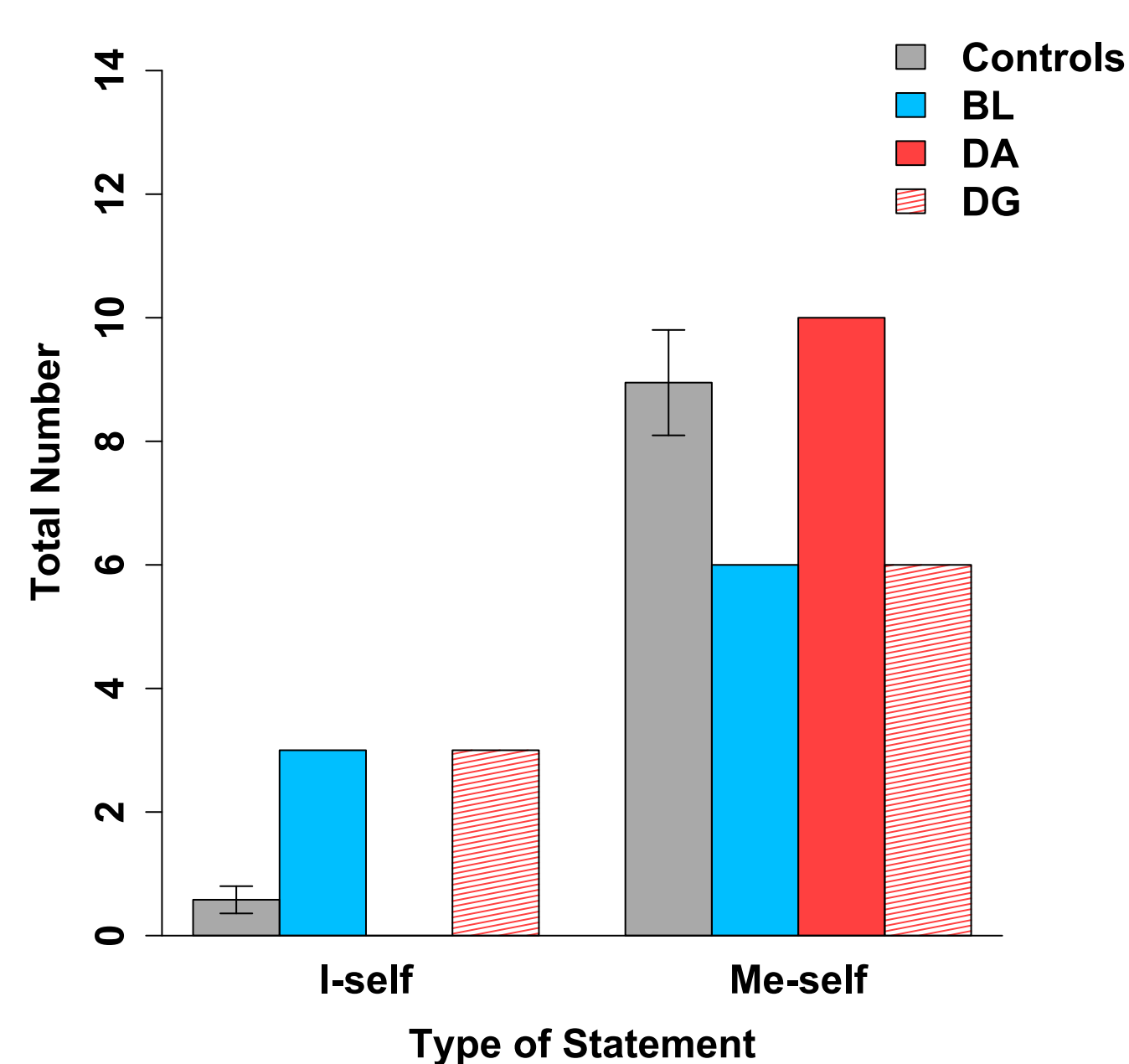
SCI RESULTS

Perceived Continuity: Controls and cases tended to report “no”

Response	Number (%) of participants			
	Controls	BL	DA	DG
Yes	6 (32%)	-	-	-
No	13 (68%)	1	1	1

I-Self & Me-Self Continuity: Cases performed similar to controls

- Generated similar numbers of I-self and Me-self statements



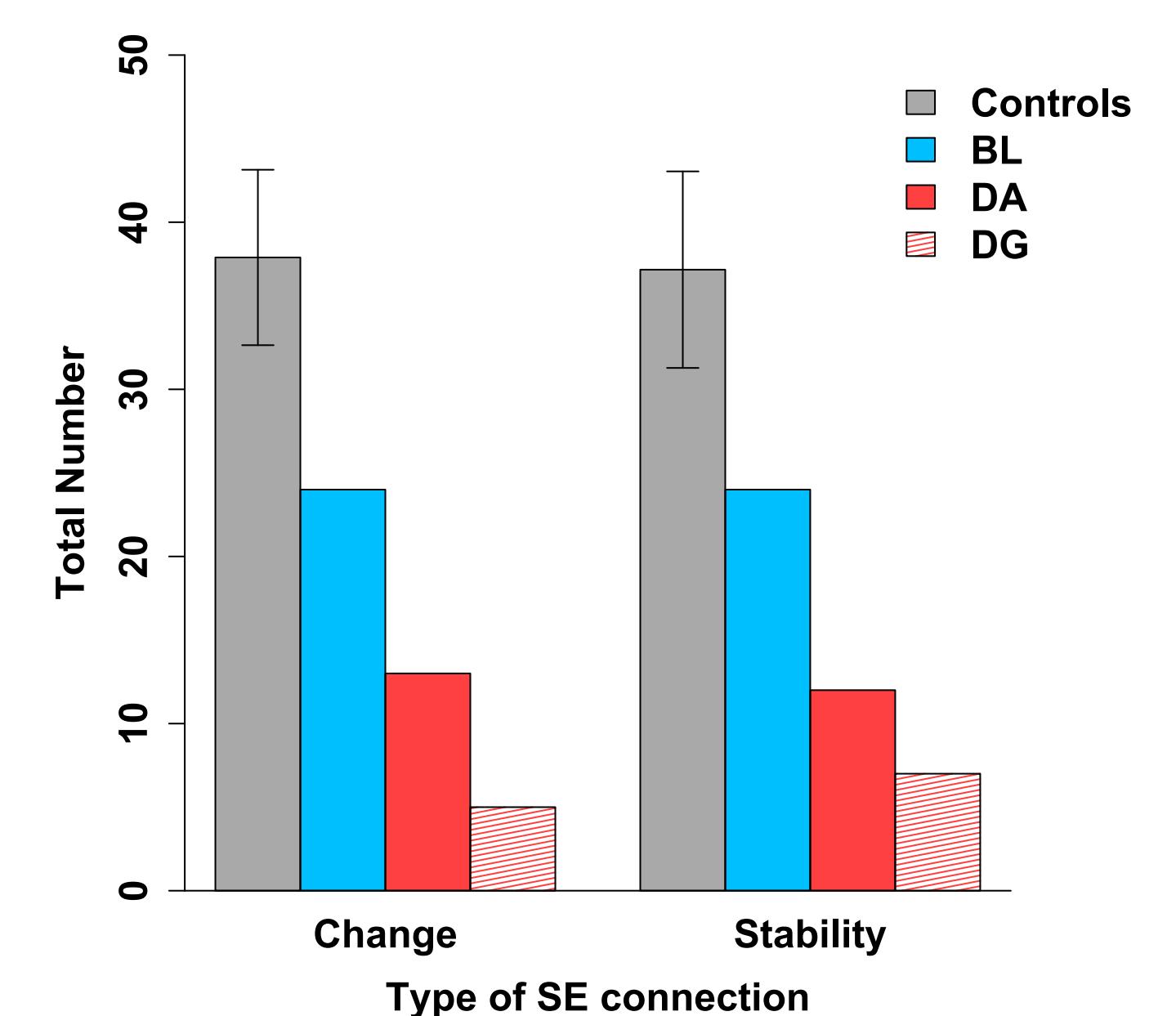
- I-Self continuity scores:**
 - Similar to controls, BL’s and DG’s scores indicated “no change” ($p \geq .26$)
 - DA: no I-self continuity score as he generated zero I-self statements
- Me-Self continuity scores:**
 - All cases and 18/19 controls had scores indicating “some change”

Continuity Explanation: Sophistication of cases’ responses was similar to that of controls

Level of Sophistication	Number (%) of participants			
	Controls	BL	DA	DG
1: Simple	1 (5%)	-	-	-
2: Topological	6 (32%)	-	1	-
3: Performist	8 (42%)	1	-	-
4: Essentialist	3 (16%)	-	-	1
5: Revisionist	1 (5%)	-	-	-

LSI RESULTS

Autobiographical Reasoning in life stories: Numbers of self-event connections generated by cases did not differ significantly from controls



Narrative Arc of life stories:

- BL:** life story had similar narrative arc to controls
- DA:** life story involved less staging
- DG:** life story had less staging & plot progression

Narrative Process	BL	DA	DG
	Zccc	Zccc	Zccc
Staging	-1.31	-1.92*	-3.67**
Plot Progression	-0.83	1.89	-2.12*
Cognitive Tension	0.37	1.62	-1.34

* $p < .05$; ** $p < .01$

DISCUSSION

Aspects of self-continuity were preserved despite episodic impairment

- All cases demonstrated intact diachronic unity (SCI) and autobiographical reasoning (LSI), suggesting that some aspects of narrative continuity can be supported by semantic AM.

Narrative arc may depend on episodic AM

- Unlike the case with the least episodic amnesia (BL), cases with more severe episodic amnesia (DA & DG) exhibited significant differences vs. controls in the narrative arc of their life stories
- Suggests that episodic AM may be necessary for narrative processes like staging and plot progression
- Demonstrates novel use of text analysis in the study of narrative continuity

Overall conclusion:

Aspects of one’s self-continuity can remain despite extensive episodic AM impairment

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