

Social Functioning Correlation with Semantic Memory Components

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Identity strength is strongly correlated with well-being and health (Greenaway, Cruwys, Haslam, & Jetten, 2016). If the foundational elements and process used to form identity can be uncovered it could have a significant impact on understanding personality and developing new psychotherapy techniques. The Sociocultural Model of Autobiographical Memory (Sociocultural Model) proposes that culture-rich social interactions provide the structure used by identity as it develops progressively over infancy, childhood, and adolescence (Fivush, Habermas, Waters, & Zaman, 2011). Do culture, identity, and social interactions have a measurably significant relationship? Empirical studies designed to gauge social skills in relation to culture-based factual memory are non-existent. Interpreting the Fivush et al. (2011) Sociocultural Model through the Tulving three level memory system theory (1985) means the foundations for identity start at the procedural, or unconscious, level in infants through culture-suffused social experiences. In the next stage of this combined model view, the acquisition of more complex social interactions and culturally-framed knowledge shape the growing narrative style and skill-set during childhood (Fivush et al., 2011). This becomes a part of semantic memory (SM), which stores facts available for recall (Tulving, 1985). The framework for identity matures in adolescence when master cultural scripts are used to cohesively narrate longer and richly detailed (Fivush et al., 2011) episodic, or personally experienced, memories (Tulving, 1985). If the Sociocultural Model (Fivush et al., 2011) has validity, then an assumption that cultural knowledge has a relationship with social skills should be viable. It would also predict a positive correlation between self-relevant SM and social skills. This study uses amnesia patients to study if SM and culturally relevant SM positively relates to social functioning in these patients.

The memory system constructs used in this study need to be clarified in more detail since they are central to understanding its purpose and interpreting the results. The three levels of memory (procedural, semantic, and autobiographical) proposed by Tulving (1985) are for past memory, also called retrograde memory. Procedural memory is the most basic system and

it manages unconscious information to produce behaviors without conscious thought (Tulving, 1985). Semantic memory (SM) is the next layer and is used to recall general facts without requiring a specific remembered experience to support the knowledge (Tulving, Schacter, McLachlan, & Moscovitch, 1988). Episodic memory is used for specific remembered personal past experiences (Tulving et al., 1988) and reaches maturity last (Fivush et al., 2011). Episodic memory includes a sense of self, time and place (Burns, J. Russell, & C. Russell, 2016). In the 2002 paper by Tulving, considerable evidence was provided to show that semantic and episodic systems use different neural pathways and regions in the brain. This paper focuses on the semantic part of the memory system.

In recent research using the Tulving 1985 memory system model, including in this study, semantic knowledge is further broken into two specialized categories. Self-relevant SM is general facts and knowledge recalled about one's self (C. Haslam, Jetten, S.A. Haslam, Pugliese, & Tonks, 2011). Culturally-relevant SM is recalled facts commonly known by a person's social generation, such as famous people and news events (Bright et al., 2006). These two different types of SM can exist without the presence of other memory types (Bright et al., 2006; Hassabis, Kumaran, Vann, & Maguire, 2007; Klein, Rozendal, & Cosmides, 2002a; Mackenzie Ross & Hodges, 1997). It is the self-relevant SM component that plays a significant part in autobiographical memory.

Autobiographical memory, the sense of self, and identity are frequently assumed to have the same meaning in a variety of different memory system theories (Conway & Pleydell-Pearce, 2000; Markowitsch, 2008; Nadel & Moscovitch, 1997). Generally, researchers using the Tulving model define autobiographical memory as the combination of semantic and episodic memory, wherein SM is believed to prime the episodic component in normal brain functioning (Mace, McQueen, Hayslett, Staley, & Welch, 2018). Since memories from before early childhood are not recalled later in life, most researchers using the Tulving model would not use the term autobiographical in reference to those early short-term memories. Fivush et al. (2011) uses the

term autobiographical memory to describe the first self-narratives that emerge during the pre-school years. This research will not attempt to define autobiographical memory. Instead it studies the early foundations of identity. As the Fivush et al. theory (2011) puts forth, the sense of self happens slowly over time, from a child's first interactions, and finally matures in adolescence. This paper aims to contribute data supporting that identity is socially and culturally shaped in SM by examining social success of episodically impaired amnesia patients.

Social Success Outcomes

Complementary sets of interpersonal skills allow a person to interact with others, make new friends, and maintain existing relationships (Little, Swangler, & Akin-Little, 2017). Successful conversations demonstrate nonverbal and verbal skills to generate positive outcomes, or at least to minimize negative ones (Little et al., 2017). To be more successful socially, a person needs the ability to interpret and use information gained from verbal and nonverbal communications of others as well. Theory of Mind (ToM) tests on amnesia patients who retain only SM demonstrate performance levels that match controls in inferring thoughts, reading facial expressions and other ToM tasks (Rabin, Carson, Gilboa, Stuss, & Rosenbaum, 2013; Rosenbaum, Stuss, Levine, & Tulving, 2007). Interpreting facial expressions is a skill tied to cultural and social knowledge (Wickline, Bailey, & Nowicki, 2009). Social instruction begins early in life; therefore, some social skill should be deeply embedded before episodic memory is developed. This means social success should be possible with only self-relevant SM. The relationship between social success and culturally-relevant memory might also be strong enough to demonstrate a significant correlation.

Self-Relevant SM as Social Success

The relationship between the SM component of autobiographical memory is a growing topic of research focus (Haslam et al., 2011; Grilli, 2017; Klein et al., 2002a). Klein, Cosmides, Costabile, and Mei (2002b) reported a case of a developmentally amnesiac subject who was never able to create episodic memories, but who did have self-trait factual knowledge. Grilli

(2017) and Haslam et al. (2011) found that self-relevant SM was a better indicator of identity strength than episodic memory. With SM and identity strength strongly linked, research into a possible correlation between self-relevant SM and social functioning is a reasonable next step. One study, by Beike, Brandon, and Cole (2016), explored feelings of closeness generated from discussing episodic memories against using semantic self-based facts for newly acquainted healthy adults. They found that there was no more social value in sharing episodic over self-relevant SM to create initial feelings of closeness (Beike et al., 2016). Will this finding still hold true when all types of other memories are removed as possible confounding variables? This study hopes to answer that question in addition to exploring the impact of SM on making new friends and on existing relationships.

Culturally Relevant SM as Social Success

Cultural narratives shape values and are integrated deeply throughout every day stimuli. The cultural influence on the formation and narration of personal identity is an important one (Wang, 2011). This paper assumes cultural information affecting, framing and teaching social interactions are a part of the SM system and therefore should demonstrate a positive relationship with social skills. Carefully chosen amnesic patients present a unique study population for exploring these assumptions. A single category and a mixture of categories for culturally relevant SM are known to exist in amnesia patients without the existence of other types of memories, including self-relevant semantic knowledge, episodic, or the ability to make new memories (Klein et al., 2002a; Mackenzie et al., 1997). It does not appear any peer-reviewed published research on social skills have used this unique group. Common categories of cultural SM include famous faces recall, famous faces recognition, famous faces familiarity, news events recall, news events recognition (Bright et al., 2006), and new word recognition and recall (Reed & Squire, 1998). A coherent and strong sense of self-identity, according to the Sociocultural Model, relies on a culture-based framework taught through social interactions prior to the full maturation of the episodic memory (Fivush et al., 2011). An aim of this study is to test

to what degree culturally relevant SM is correlated with the demonstration of successful social skills.

Wrapping Up the Social Success and SM Relationship

Fivush et al. (2011) proposes that identity is learned over time through social interactions and it is framed within cultural scripts and narratives. They report that children in the United States, China, and Korea as young as 4 to 6 years old already have single-story narratives that reflect their individual cultures. If the theory proposed by Fivush et al. (2011) and the memory model of Tulving (1985) holds true, then some social skills should be in place prior to the formation of episodic memories. As Davidson, Drouin, Kwan, Moscovitch, and Rosenbaum (2012) pointed out, the use of amnesia patients to study social behavior has been limited to only a few studies. Although the Davidson et al. (2012) study concentrated on the episodic memory relationship with social functioning its findings show SM patients demonstrate successful social skills. They found that their three episodically impaired amnesia subjects valued their relationships and were personable socially. The subjects displayed normal conversational skills, social manners and the ability to make inferences about other's thoughts and feelings (Davidson et al., 2012).

The case for the self-relevant memory connection.

If a strong sense of identity can exist in patients without episodic memories or the ability to make new ones (Klein et al., 2002b), and social closeness can be created by sharing general self-facts (Beike et al., 2016), then successful social skills may be present at a statistically significant level in the absence of other memory systems. In that case, social functioning may be a part of the framework upon which a mature identity is constructed.

The case for the cultural-relevant memory connection.

If culture is the foundation of the memory system and social interactions are taught through culture then it is feasible for a correlation between cultural knowledge and social skills to exist independent of self-relevant semantic knowledge. If the Sociocultural Model (Fivush et

al., 2011) is valid then some useable social skills will correlate positively with culturally-relevant SM. This would indicate that culture may play an important role during the formation stage of identity.

Study hypotheses.

Hypothesis 1: Degree to which amnesia patients retain self-relevant semantic memory will have a positive correlation with social functioning.

Hypothesis 2: Degree to which amnesia patients retain culturally relevant semantic memory will have a positive correlation with social functioning.

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