

CONCEPTUAL AND MEASUREMENT ISSUES RELATED TO TRANSACTIVE MEMORY SYSTEMS: INDICATORS VS. STRUCTURE

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ABSTRACT

Transactive memory systems (TMS) are frequently measured based on their antecedents as opposed to the structure of knowledge of who knows what, their theoretical definition. A measure of structure is adapted from prior work and compared to a measure of TMS's indicators.

We find that these measures are similar but complementary.

Transactive memory systems (TMS) have been studied in many contexts and with a variety of methods, but little work has compared the different measurement methods. A transactive memory system is a collective system of memory where individuals can rely on one another for knowledge instead of needing to know it themselves (Wegner, 1987). Transactive memory systems are theorized to be composed of the storage of knowledge itself as well as the transactive processes that create the memory store and maintain it: encoding, storing, and retrieving information (Wegner, 1987; Lewis & Herndon, 2011).

Though this description of transactive memory systems is widely accepted, little empirical research attempts to directly measure either component of a TMS, knowledge or processes. Instead, the majority of researchers investigate the indicators that a TMS has developed within a group: effective coordination, member specialization, and trust in the expertise of other team members (Liang, Moreland, & Argote, 1995; Lewis, 2003; Kanawattanachai & Yoo, 2007). This assessment of TMS is conceptually supported, but because the antecedents of TMS are measured instead of the structure of knowledge itself, there has been some confusion in the literature over what a TMS is (Lewis & Herndon, 2011). Additionally,

there has been no empirical attempt that we are aware of to validate that the current measurement techniques with one another.

In order to add to theory and measures of TMS, this paper assesses groups on a traditional indirect measure of the indicators of TMS (Lewis, 2003) and on the structure of knowledge information in the group (Austin, 2003). Austin (2003) proposed that the structure of TMS could be measured directly by calculating the structure of members' areas of knowledge and their understanding of their peers' knowledge. Specifically, Austin proposed that TMS should be assessed with four measures: amount of knowledge, member specialization, consensus on experts, and member-knowledge accuracy. In this paper, the Lewis (2003) and Austin (2003) measures of TMS are then compared to one another in both their interrelationships and their ability to predict group performance. This paper is unique in comparing these two techniques in measuring group TMS, improves upon theory around the concept of TMS, and validates the common measure of TMS.

We analyzed data from 46 groups of four that worked on both a programming task and an innovation task. We modified the Austin measure for our purposes, creating a knowledge dimension for each task groups completed. We found that the Austin measures of TMS improved the model fit in predicting both errors and innovative ideas compared to the Lewis (2003) measure of TMS alone. Specifically, we found that the measures of knowledge of the relevant task positively predicted group performance and that member-knowledge accuracy improved the number of innovative ideas produced. Thus, we found evidence that some aspects of Austin's assessments of TMS explained additional variance in performance not picked up by the Lewis measure of TMS. However, the two measures of TMS are reasonably correlated and appear to be picking up overlapping and unique aspects of a group TMS.

Though transactive memory systems have now been studied for a number of years, no prior work (to the authors' knowledge) has directly compared indirect and direct measures of a group's TMS. The popular Lewis (2003) measure is an indirect assessment of a group's TMS that measures the presence of three indicators of a group's TMS. The Austin (2003) measure is a direct measure of TMS that uses a combination of the knowledge about the task within a group, the variety of that knowledge, and the group member's agreement on who has what knowledge as a more direct assessment of the group's transactive memory system. The analyses in this paper found a strong relationship between both measures of TMS, the indirect and the direct measures. The Lewis measure is related to several components of the Austin-style measure and both measures are similarly predictive of group programming errors. It is also validating that two vastly different approaches to measuring TMS appear to be picking up the same underlying construct. Thus, though the Lewis and Austin measures are quite different in their implementation, they appear to cover a large overlapping amount of variance.

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