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Introduction and Literature Review

What should be accepted in all discussions of leadership is that at the heart of leadership is some degree of exchange between follower and leader. For, if no one is leading, then how can leadership be present? It would seem that simply the presence of a follower, who accepts someone as a leader, may provide a sufficient explanation of what it means to be a leader and to describe the presence of leadership. One could even argue that accepting the role of leader is not an essential component of leadership. Admittedly, this definition is simplistic; however, it highlights the importance of the follower in understanding leadership.

Given that the presence of a subordinate/follower is essential to leadership, Lord and Maher suggest a succinct definition of leadership (1993, page 11). In their definition, Lord and Maher, "define leadership as the process of being perceived by others as a leader." While this perspective may inaccurately dismiss the role of behavior and the leader, by accepting this follower-centered definition of leadership, one begins to understand the relative importance of the follower in leadership theory, and that many theories neglect, or minimize, the follower component outside of measurement of leadership behaviors.

The purpose of the studies discussed below is to continue the advancement of leadership theory past first-order theories which focus on directly observable behaviors and explanations, and do not delve past what may be obvious. To accomplish this, the studies will integrate the domains of Implicit Leadership Theory and the connectionist perspective in such a fashion, that the two approaches will provide for a more refined understanding of how a leader is perceived by a follower. Implicit Leadership Theory has offered a great deal of insight into the cognitive structure of leadership representations, while the connectionist perspective offers the potential to understand the subtle variances within an individual's leadership representation.

First-order theories of leadership

A common focus of discussions regarding first-order, or higher theories of human behavior is whether or not a first-order theory is sufficient in explaining the broad behaviors of human beings. Chalmers (1996) argues that as human consciousness is a necessary condition, and is irreducible, first-order theories are insufficient, because understanding human behavior in the absence of consciousness is inappropriate. As leadership behavior based theories may neglect the role of consciousness or cognition, to truly understand leadership, theory development must incorporate the thoughts of all parties involved in the process, which necessitates second-order theory development. The first-order theory would emphasize that a leader demonstrates certain behaviors and/or certain traits that in turn influences the behaviors and cognitions of the follower. In this approach, the effect of a follower's behavior, be it one or thousands, is influenced by the behavior or traits of the leader. These theories can place the locus of leadership firmly in the attributes and abilities of the individual who is the leader. By following this approach, one provides a rather straight-forward and real world approach to explaining the relationship between the leader and the follower. This approach has the potential to minimize the process of leadership and to some extent the importance of the follower in understanding leadership. As Calder (1977) points out, "explanations of everyday life are implicitly assumed to have some scientific status" and the assigning of social meaning by a group of actors is where the validity of a first-order theory is discovered. Calder (1977) later notes that "the individual who uses the first-degree construct of leadership must work backward from behavior and can never know with certainty whether or not leadership qualities exist as a personal cause of behavior."

Though the follower is not seen as important in some first-order theories, first-order approaches are commonly used when one administers questionnaires like the LBDQ and the Multifactor Leadership Questionnaire (MLQ). These questionnaires attempt to capture the observable behaviors of the individual leader, and by doing so, seek to operationalize what makes a person a leader. These questionnaires often use the follower perception as the filter that identifies and indicates what is important in leadership.

Within leadership theory, first-order theories are abundant. As discussed in Brown and Lord (2001), trait theory is a common example of a first-order theory. For example, individual (A) may act a certain way (B) in the presence of another individual (C). Within this theoretical construct, what is emphasized is a processing level that occurs in a simple linear fashion. Within this linear model, the focal point is on the presence of certain traits and/or behaviors in the interaction between A and C. What makes the trait approach interesting is that the traits that are seen as representing leadership have been operationalized using assessments that focus on the perceptions of others. This is not to say that this approach takes for granted the other processes at work in leadership interactions, they stop short of trying to explore the deeper processes of perception and categorization occurring within the individual, which would explain why someone is perceived as a leader.

Simply stated though, the more one begins to explore an explanation, or theoretical construct, past the first-order, the more challenging it will become to develop a parsimonious, generalizable, and user-friendly model. If one is trying to develop a model that can be easily accessed and used by a variety of people, then a first-order theory is definitely the best starting place. However, the trade-off that one naturally incurs with the creation of such a parsimonious

and generalizable theory is an approach that may not be sensitive to individual differences and the subtle intricacies that permeate our daily interpersonal interactions.

Second-order theories in leadership

A second-order theory will address the more abstract, "black-box," processes involved in a social phenomenon. The abstract components of a second-order theory are beyond the field of simple observation, and within leadership, are focused at the cognitive/perceptual level. As Brown and Lord (2001) suggest, the cognition of interest is the subordinate cognition. Subordinate cognition is influenced by more than just the traits and behaviors exhibited by the person who may or may not be perceived as a leader. When cognitions are taken into consideration, both internal and external factors, such as schemas, performance expectations and outcomes, and prior knowledge, will influence how the subordinate perceives potential leaders. This is all to say that one should not expect behavioral ratings of leadership to be free of person and/or situation specific differences in perception. One should always assume that the cognitive nuances of the subordinate are reflected in their behavioral ratings of the target person. Additionally, the intervening cognitions of the subordinate will have implications for future motivational processes, performance, and additional cognitive processes. An example of a second-order approach to leadership theory can be found in Implicit Leadership Theory (ILT).

Implicit Leadership Theory

While there are varied perspectives around implicit leadership theories, it is generally suggested that individuals possess various prototypes and exemplars of a variety of leader types. Exemplars are those cognitive representations drawn from the most salient example of what a leader is to an individual (Cantor & Mishcel, 1979), such as when a child uses their Little League baseball coach to define and evaluate a potential leader. The concrete nature of the exemplar

representation explains the common use of these representations among children (Lord, Brown, & Harvey, 2001).   As an individual has more exposure to a variety of leaders, and potential exemplars, an abstraction of various attributes is compiled to form a prototype.

Rosch (1978) and colleagues examined the prototype as a cognitive representation. Using object classification, Rosch was able to conclude that within the prototype, there are three hierarchical levels (basic, superordinate, and subordinate) that are used in the categorization process. This hierarchical approach to understanding classification has been carried over into leadership research through ILT (Lord, Foti, & DeVader, 1984). By design, if enough prototype related traits and behaviors are demonstrated by an individual, then the observer will label him/her as a leader. Upon identification of a leader, the perceiver will activate related schema, which will influence what is accurately or inaccurately, remembered about, and attributed to, the leader (Phillips & Lords, 1982). While prototypes influence leader perceptions over time through exposure to various leaders, some suggest that individuals look beyond prototypes for a leader that is similar to themselves as the ideal leader (Keller, 1999; Lord & Brown, 2004).

Embedded in the discussion of ILT are the schemata, which provide prototypic expectations for events and people, that serve as cognitively based expectations that are carried around as individuals go through their day-to-day situations. Schemata are useful because they organize our knowledge about the world, at various levels of abstraction. When experiencing an event, we use schemata as a check against the incoming information and remember information that is consistent with an activated schema (Swann & Read, 1981), this process is similar to how our ILTs influence our recognition of a leader. With regard to the overall stability of an individual schema, they are slow to change, but will make a significant change if faced with a critical mass of information (Dalgleish, 2004). Implicit Leadership Theories are also seen as

being relatively stable over time, as evidenced by the results of work done by Epitropaki & Martin (2004) assessing ILT stability over a one-year period.

Implicit Leadership Theory suggests a cognitive structure within an individual's mind that consists of prototypes built on abstractions, and schemata used to guide behavioral expectations. While, an appropriate construct for understanding the process that underlies differentiation between the leader and the non-leader, the connectionist perspective provides a means for increasing the role of context in the identification of a leader. In particular, the generation of the cognitive representation will be a more dynamic function of not just the behaviors being exhibited by the leader, but also the situation in which the leader is acting. For example, if an identified political leader was involved in a debate about abortion issues, and took a position counter to that held by an individual perceiver, the behaviors exhibited by the leader may not be recognized as those of a leader simply based on the fact that the leader's position is counter to what the perceiver holds as important. The lack of leader recognition will occur as a function of the dynamic representation that occurs within the connectionist approach. The activation of the abortion issue could work to inhibit the activation of the common leadership identification process. By allowing for a more fine-grained analysis of the processes involved in leader perceptions, the connectionist perspective could more clearly define some of the underlying assumptions and structure of ILT.

ILT suggests a relatively static cognitive process as the abstractions of prototypes are called forth repeatedly to provide a basis for judgment; in effect, prototypes are activated like schema. To perceive of the prototype as a fixed memory structure may minimize the relative influence of factors, outside of one's memory of a leader, that influence impressions of leaders, such as context and environmental factors. Instead, utilizing a connectionist perspective, one can

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conceive of prototypes as being "generated by preconscious, subsymbolic information processing architecture" (pg. 284 in Lord, Brown, & Harvey, 2001). This architecture would function on a level below the conscious awareness of the individual, with a structure that consists of the various variables of interest one may use in identifying a leader. As the architecture is subsymbolic, there is not a specific representation, or symbol, for what a leader is that is always ready on stand-by for comparison against a potential leader. The processing architecture operates on a moment-to-moment basis, sensitive to the environment and ongoing experience, or as Brown and Lord (2001) say, "on-the-fly." A connectionist perspective views an individual's process of cognitive representation as a dynamically unfolding process. What follows is a general overview of impression formation and connectionism.

Connectionist Architecture Perspective

While there are a variety of connectionist models in the literature, certain elements define the connectionist perspective. What is crucial in connectionism is the process of activation between the units, or nodes, that store knowledge. Like the neurons of the brain, it is theorized that the units that store knowledge are connected to one another, allowing for communication between the units. Much like the neurons of the brain, the units work to activate one another, inhibit one another, or can simply be at rest.

What determines the influential strength that one unit may have on another is the weight of the between-unit connection. Theoretically, the weight of a connection between units is usually assigned a numerical value between -1.0 and + 1.0. A connection between units is inhibitory if the weight is negative in value, while a positive weight value indicates an excitatory connection. While interactions between units occur rapidly, much like synapses firing in the brain, the associative weights between units are slow to change. It is suggested that learning is

taking place when the between-unit weight values begin to change. These basic units and connections are common across all connectionist models, what will vary across connectionist perspectives is whether accounts of concepts and objects are hypothesized as localized or distributed.

If one suggests a local representation, then a single cognitive unit is responsible for representing an object, say for example an elephant. The suggestion is that to recognize and understand that there is an elephant in the room, one independent cognitive unit, representing an elephant, must be activated, and the other units associated with elephant must not be active. According to van Gelder (1999), a more exemplar like representation would be a strictly local representation, where all that matters is that a single cognitive unit is activated. By contrast, a distributed representation requires the activation of a series of cognitive units, which may or may not be close to one another conceptually. Continuing with the elephant example, a distributed representation of an elephant would require the activation of units representing the legs, trunk, size, color, etc. of an elephant. Thus, with this approach, the processing and recognition of the elephant is a function of the individual units and their connections. Representations are found in patterned activations over a group of units (Dinsmore, 1992), not simply one unit. While this distinction between local and distributed representations is somewhat coarse, those interested in a more refined distinction are directed to van Gelder (1999).

Additional variations in connectionist perspectives also emerge in theorizing how the units are arranged and the direction of activation flow between the units. Conceptually, a distributed representation can cognitively represent concrete objects, such as letters, as well as more abstract constructs such as leadership. As distributed representations cross over all domains of cognitive understanding, to specify, as some have (Sedlmeier, 2005), that

connectionist modeling is synonymous with prototype modeling would be misleading. For a more in-depth discussion of connectionism and issues relating to the various connectionist models, interested readers can read Ramsey (1992) and Dinsmore (1992).

The connectionist perspective adapted here as a theoretical guide to the studies presented in this paper, is that of a distributed model, in which concepts find their representation in activation over a group of units and not simply a local representation. The work of McClelland, Rumelhart, and the PDP Research Group (1986) provides the theoretical basis for assertions made from this point forward. Through their work, McClelland and colleagues have proposed a model of Parallel Distributed Processing (PDP), in which units act in a parallel fashion with one another and as a result, they do not possess a specific executive function unit or units. The units send excitatory and inhibitory signals to other connected units and a result, or representation, will emerge when the units reach a state of rest in which the units are no longer working to excite or inhibit other connected units. It is suggested that the PDP model can account for a significant amount of the process and structure of our cognitions.

Connectionism and Leadership

Within the field of leadership research, Lord and colleagues have provided several theoretical essays that integrate the connectionist perspective with leadership theory. One particular article of interest by Lord, Brown and Harvey (2001) offers a generic connectionist model of schema activation for leadership. Within their model are three levels of interest, which are activated below conscious awareness at a preconscious subsymbolic level. The initial level of behavioral inputs is where the explicit behaviors of the potential leader are being displayed for others to perceive and interpret. It is at this level that behavior based theories of leadership should derive most of their validity. The next level of interest is the leadership schema in which

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there are a number of interconnected traits and expectations based on what a leader should do and the characteristics they should possess. Here is where the theoretical influence of trait theories would emerge. The third level of interest is the contextual constraints placed on the perceptions of a leader. Contextual constraints offered in the Lord et al model are the goals, values, and affect of the parties involved in the social exchange, as well as the norms and values of the culture.

The model offered by Lord et al. (2001) does not specify the weights and connections that may exist within the connectionist network, yet the emphasis is placed on the exchange that takes place between the unit connections. Within their model, activation of the various units cycle through until levels of activation between units stabilize and optimally fit within the constraints of the situation. This process, referred to as "settling-in," allows for the creation of a mental representation, like a prototype. In this instance, Lord et al (2001) suggest that the networks do more than simply remember information; instead, the networks work to dynamically assemble the representation, through the preconscious subsymbolic architecture, which may or may not emerge in a predictable fashion at a level of conscious awareness. This process of recreating information allows a level of sensitivity to context and provides for a more dynamic process, and the potential for each representation experience to be uniquely different, though very often representations will settle on what is common.

Lord et al's (2001) generic model of leadership perception adds to the foundation for the integration of the connectionist and ILT models (Lord, Foti, & DeVader, 1984). Both models contain parallel levels, for example, parallels between the behavioral input level of Lord's model, and the superordinate level of ILT, is found in the fact that both focus on a simple identification of leader behaviors, which is what is occurring when an individual is identified in ILT as being a

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leader or non-leader. The schema level of Lord et al's (2001) model is similar to the basic level in ILT, where the leader is being defined by a specific schema, a more fine grained and worthwhile distinction for the perceiver. The constraint level in Lord et al's (2001) model is similar to the subordinate level in that it seeks to make a more fine-grained differentiation between individuals existing in certain leader types. Though the distinguishing characteristics of interest may be more varied in the connectionist model, this is where connectionism makes its strongest contribution to the area of leadership, and where most of the focus of the study and integration of ILT and connectionism will lie. It is at the constraint level and subordinate level that the nodes would reside, this is where the distributed representations would begin their preconscious subsymbolic activity.

At the constraint level in Lord et al's (2001) model the schema or representation is its most subtle and malleable, which would be reflected in the activation of a distributed representation. The beauty of connectionism is that the subtle points of the microstructure can influence the representation of a leader that is settled on by each individual perceiver. At this micro-level, the subtleties of context and situation exert their influence, and it is because of this that the "on-the-fly" description seems most appropriate. The next question is how do the constraint variables influence the activation occurring within an individual set of connections?

Insight gained from other areas of cognitive and social psychology suggest how various cognitive processes constrain how we perceive and interact with the environment across various situations, as they influence which units, or nodes, are activated in our minds. If each representation of a leader is indeed created "on-the-fly," then the form of information processing, either controlled or automatic, enacted by the individual should have a significant impact.

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Controlled and Automatic Processing

How we perceive somebody, with regard to trait inferences and stereotypes are often suggested to occur automatically without an individual's awareness (Winter, Uleman, & Cundiff, 1985; Gilbert, Pelham, & Krull, 1988). Additionally, some have demonstrated that an individual can override his/her automatic judgments when situational constraints/variables suggest that a revision is necessary (Gilbert et al., 1988). Kunda & Thagard (1996) suggested that both of these processes work together, and that the interaction between these processes warrants further exploration.

To better understand how processing unfolds in the emergence of representations, a brief explanation of controlled and automatic processing is warranted. In a 2003 paper by Schneider & Chen, the authors submit the following definitions of control and automatic processing, as offered by Schneider & Shiffrin (1977). Automatic processing is "the activation of a sequence of nodes that nearly always become active in response to a particular input configuration and that is activated automatically without the necessity for active control or attention by the subject" (pg. 526). Controlled processing is "a temporary sequence of nodes activated under control of, and through attention by, the subject" (pg. 527). In addition, there is an understanding that controlled processes are bound by the constraints of the human mind, so that these processes are limited in how much information they can store and process at any given time. The role of automatic and controlled processing has been explored in the area of social cognition, and provides further clarification of how the process of recognizing a leader can be impacted by situational factors. In a social judgment situation, an individual can begin engaging in automatic processing, and may then choose to move to a more controlled or engaged level of processing. The use of controlled processing would allow the processor to make a more informed or accurate judgment,

however, as has been demonstrated in previous research, people are cognitive misers and tend to rely on automatic processing (Branscombe & Cohen, 1991).

In their 1996 paper, Kunda & Thagard discussed how processing impacted the emergence of stereotypes and the integration of individuating information. The researchers suggested, through their use of modeling of a parallel distribution network, that automatic processing allowed for a more stereotyped impression to emerge, while the use of controlled processing allowed for a more contextualized, non-stereotyped impression to emerge. For example, the authors explored the interpretation of a shove in the context of whether the person doing the shoving was black or white. They found that because of stereotyped expectations, the node for aggressive was more strongly activated when black was also activated, and not as strong when white was activated. Kunda & Thagard, like Gilbert et al. (1988), propose that individuals begin at the automatic level of processing, occurring at the non-conscious level, and then must act to override the automatic processing and engage in controlled processing. Several factors are suggested to cause a shift from automatic to controlled processing. As suggested by Gilbert et al. (1988), moving from automatic to controlled processing requires cognitive effort, meaning that factors such as task complexity and motivation will influence the level of processing a person engages in, and in turn, impression formation.

Specific to prototype activation, a 1996 study by Hess, Pullen & McGee, examined how automatic and controlled processing impacted the recognition of prototypes. In their study, Hess and colleagues presented two groups of people, one younger and one older, with a series of prototypes. An arbitrary prototype was presented that consisted of randomly presented characteristics, and a positive prototype which aligned with commonly held prototypes. Younger participants were able to recognize the arbitrary prototype, while older participants failed in the

recognition. When older and younger participants were presented with a positive prototype, the older participants performed at a higher level of recognition. These differences are explained as a function of the use of automatic over controlled processing. The authors suggest that older participants rely more on automatic processing, because they are less able to override the process with controlled processing. Younger participants are suggested to use controlled processing with greater ease and can then identify an arbitrary prototype with greater ease.

Branscombe & Cohen (1991) provide evidence that an individual's motivation can influence the use of controlled or automatic processing. When individuals are motivated, by the complexity of a task for example, they will actively engage in controlled processing. For example, when an individual believes that "the outcome of a decision has real personal consequences" he/she will utilize controlled processing. Therefore, it is reasonable to suggest that when a follower is observing a leader, if the actions of the leader are of great personal interest to the follower, the follower may override, or augment, the ILT process of recognition that normally unfolds. It is appropriate at this point to suggest that perceiving of cognitive processing as a simple dichotomization of either controlled or automatic processing may be misleading. It seems reasonable to suggest that when evaluating individuals in a contrived or lab environment, where participants know they are being observed, the participants may never cross into a truly automatic level of processing, but instead exhibit varying levels of cognitive processing in the task, which may tend more toward automatic than controlled. Further influencing levels of cognitive processing is motivation of individual participants to perform a task. Specifically, the role of motivation in the activation of and ILT is discussed and evaluated in a recent article by Epitropaki & Martin (2005).

In an exploration of how follower ILTs influenced the impression of Leader-Member

Exchange (LMX) relationships, Epitropaki & Martin found that individuals low in motivation

were more likely to engage in categorical thinking with ILT when evaluating the quality of their

relationships with a leader, due in part to the tendency to use the processing that is least effortful.

Alternatively, followers with high levels of intrinsic motivation did not rely as heavily on ILT

factors to evaluate the quality of their LMX relationship. The findings demonstrate that

individuals can choose to move beyond ILT reliance.

Automatic processing and controlled processing are impacted by perceiver motivation,

which in turn works to impact the emergence of impressions and the identification of prototypes,

such as identifying who is a leader. In addition, the reference to node activation in the definition

of controlled and automatic processing, provides a conceptual link to the PDP models of

McClelland & Rumelhart. While the PDP model speaks to how the nodes will act to inhibit or

excite other nodes, the controlled and automatic processes, and factors such as motivation

suggest how attention influences node activation. By combining the two processes, one can gain

an appreciation for the conditions under which initial node activation occurs, and then the

process that begins to unfold following node activation.

A More Refined Connectionist Model of Leadership

Given the importance of node activation in the connectionist architecture framework, and

the different paths of node activation that are possible within an individual's cognitive process,

and the role of motivation and effort in cognitive activation, a more detailed connectionist model

can be offered to the field of leadership research. The purpose of the focal study is to

demonstrate that the cognitive representations that emerge during the observation of a leader are

a function of not only an individual's ILT, but also the level of attention or engagement an

individual is experiencing. The more engaged an individual is in the selection of a leader, the more likely they will be to change the pattern of node activation based on information outside of the leadership behaviors and expectations captured at and beyond the subordinate level of ILT. In this connectionist model, context and factors such as attention and the resulting processing levels will influence the leader representations that emerge.

By means of explanation, when individuals are in novel situations, they are required to attend to a variety of information and stimuli (Read & Miller, 1998). At this point, the information may be novel, redundant, useful or meaningless. So, the first step is to pare down the stimulus field into what is relevant and meaningful to the perceiver. As in Wyer (2004), the "sufficiency postulate" explains that people will "retrieve and use only the amount of information that they consider sufficient for attaining the processing objective they are pursuing at the time" (pg. 48). Now, the individual perceiver must partition their attention to the information they view as relevant. With regard to processing leader information, if an individual is selecting a new leader from a group, confirming or disconfirming a person as a leader, an individual may see behaviors that are leader prototypical, non-leader prototypical, or not acknowledge/recognize the behaviors at all.   However the processing unfolds, an individual may choose to integrate or disregard new information. If an individual chooses to process new information, by engaging in controlled processing, he/she will begin an iterative process of comparing the incoming information to their expectations. Wyer (2004) describes a similar process as a goal-directed retrieval process in his discussion of social comprehension.

If new information does not offer relevant information, because a representation has been settled on, or the individual is not motivated, then an individual switches to the less effortful levels of automatic processing. If the new information is relevant, then the individual will

continue with a cognitively more effortful, or controlled, processing approach until they reach a point where any new information is irrelevant, or new information is unavailable. When an individual is engaged in the less effortful forms of automatic processing, the pattern of node activation occurring at the subordinate level of ILT, will follow the most familiar path and settle on the most familiar representation within an individual's ILT, which may be conceptualized as the prototype.

With the use of a more engaged level of controlled processing, node activation is dynamically influenced by novel information, which directly influences the pattern of node activation experienced during the generation of a cognitive representation. The dynamic process would suggest that an individual may violate the prototype most common to his/her ILT, as a function of the connectionist construction that occurs under the umbrella of the subordinate level ILT level. The implications are that until the active influence of new information ceases, the nodes will not be able to settle into a well-defined cognitive representation of a leader. The final representation will determine if an individual perceives a leader, and will indicate the type of leader, in terms of both effectiveness and type of leader, i.e., an academic or military leader; which would be represented at all three levels within an individual's ILT. As every interaction an individual experiences contains new information, this process will play out with every experienced interaction, creating a new cognitive representation with each new evaluation, though not necessarily producing a unique representation with every new evaluation.

If the structure and processes proposed here are accurate, then when the leader representations of individual perceivers fail to align with the leader representations suggested by his/her ILT, perceivers are not being inconsistent, but merely engaged in a situation sensitive, and dynamic process. In particular, people should be expected to vary from predictions based on

ILT when they are more actively engaged in the leader selection process, because the patterns of node activation will change as new information is weighted differently. The net result of the change in node activation will be a cognitive representation that is different from one predicted solely on the expectations of ILT.

This approach to understanding how an individual scans his/her environment and makes judgments about who is or is not a leader is useful because it addresses any disconnect between the implicit leadership theory literature and the connectionist models that have already been proposed in the leadership arena, and suggest that these two perspectives are complementary. By assessing how an individual can choose to let a familiar pattern of activation occur with automatic processing, it becomes clear that across people, implicit leadership theories and seemingly static prototypes will emerge. The evidence for implicit leadership theory is strong, and by asking individuals to describe what their understanding of a leader is, researchers have tapped into the various nodes underlying the representation of a leader.

If subjects are placed in scenarios where they are asked to describe the behavior of leaders, yet perceive little relevance to them personally, the researchers may be tapping into representations that are based solely on less effortful levels of automatic processing, allowing the implicit theory to appear as relatively stable over time. Yet, when in a situation where leader judgment is particularly relevant or meaningful, individuals may not simply rely on their familiar implicit leadership theories, and instead modify their impression of a leader, as suggested by their ILT, to an impression that is more or less leader-like. These fluctuations in leadership identification may make ILTs seem less stable than they really are. The suggestion made by the connectionist approach is that when an individual is more actively engaged in the leader identification process, he/she will create a more dynamic representation of a leader. These

dynamic representations will vary from the prototype, or schema that may be common to an individual's implicit leadership theory, but should not be so divergent that given a different situation a more predictable pattern of node activation will emerge.

In order to test the assertions that individual cognitive representations are susceptible to levels of cognitive engagement, the primary study placed student participants in a situation that was either high in personal relevance, or lower in personal relevance, and asked participants to select a leader from a set of potential leaders. The study introduced an issue that was either low or high in relevance and was designed to induce different levels of cognitive engagement, where individuals experiencing the situation as more relevant would be more actively engaged in the cognitive processes of selecting a leader. The study design allowed for the testing of the hypotheses that follow.

Hypothesis 1: When an individual is asked to select a leader from a group of potential leaders and the situation in which the leaders are embedded is of personal relevance, he/she will select the leader based on personal belief alignment. When an individual is asked to select a leader from a group of potential leaders and the situation in which the leaders are embedded is of no personal relevance, then he/she will select the leader based on alignment with cognitive expectations for a leader.

Hypothesis 2: When an individual is asked to select a leader from a group of potential leaders and the situation in which the leaders are embedded is of personal relevance, he/she will exhibit a disturbance in the stability of their cognitive representations. When an individual is asked to select a leader from a group of potential leaders and the situation in which the leaders are embedded is of no personal relevance, then he/she will not exhibit a disturbance in the strength of their cognitive representations.

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<u>Pilot Studies</u>

In order to orient the reader to the four studies that follow, the first three pilot studies were designed to guide the development of the focal study stimulus. The focal study stimulus was a video of a group discussion between three student actors, who performed a script that focused on the manipulation of two main variables. The first variable was a manipulation of leadership behaviors and their associated traits, while the second was a manipulation of topic relevance. Pilot studies 1 and 2 derived the appropriate behavioral expressions of leader associated traits, and also assessed how the trait and behavioral networks were most commonly associated with the cognitive representations of student participant perceptions of student leaders. The third pilot study assessed the topic relevance manipulation from the secondary data collected during pilot studies 1 and 2.

Pilot Study 1 - Stimulus Development

Participants

In order to develop the Video Vignette Behavior Selection Task (VVBST), which is the main stimulus of the focal study, this pilot study sought to establish the extent to which a series of behavioral statements represent traits commonly used to describe leaders. In order to collect the information, 30 Virginia Tech students (21 female), aged 18 to 22 (avg. = 18.7), were recruited via the SONA system at Virginia Tech and participated in the pilot study in exchange for extra credit in a psychology course. In order to achieve a participant pool that generally represented a university student sample, all participants were required to be 18 years of age. Additional criteria for participation were access to the internet via a computer and that the study was completed during one sitting.

Materials

Participants completed an online survey, developed using Snap Surveys' Snap 8 survey software. The survey was based on a list of discrete behaviors representative of ILT trait factors suggested by Offerman, Kennedy, & Wirtz (1994), and Epitropaki & Martin (2004). The behavioral sentences were derived from a variety of sources that addressed leadership behaviors and those associated with the factors described by Epitropaki & Martin (2004). (see Appendix A for a trait-behavioral statement list).

Survey presentation required participants to make responses over the span of 10 survey pages. The first survey page collected general demographic and consent information. Pages two through nine asked the participants to read a series of statements and then rate the statement on how well it described the behavior of a person represented by the underlined word, such as "A person who is intelligent can think quickly when questioned." Seven trait-behavior statements were presented on each page, beginning on page two, through to page nine. The traits and behaviors were paired so that throughout the survey, each trait was listed with two behavioral statements meant to reflect the trait, and two behavioral statements that were meant to reflect a different trait. The traits or behaviors were not presented more than once on each survey page. In addition, no trait or statement appeared as the last item on a page and then as the first item on the following page. The final page of the survey collected general information on the understanding of Virginia Tech's honor system, the use of single sanction systems, and support of a single sanction system at Virginia Tech (see Appendix B for a complete survey).

Design and Procedure

Once registered for the study, participants were directed to an online survey. The survey asked participants to provide consent and some general demographic information. Upon

providing consent, participants began the survey with instructions to read a series of behavioral statements and to rate the statements on "how well [the statement] describes the behavior of a person described by the underlined word." Participants rated 56 statements on a 7-point Likert-type scale, ranging from 1 (not at all representative) to 7 (extremely representative).

Upon completion of the rating task, participants completed a series of questions about opinions and preferences with regard to the honor system at Virginia Tech. Upon completion of the online survey, participants were thanked for their participation and directed to a debriefing page.

Results

The rating data were analyzed in order to select the 10 trait-behavior statements for use in a second pilot study and the development of the video stimulus of the main study. The means for the representative trait-behavior statements ranged from 3.47 to 6.53, while the means for the non-representative trait-behavior statements ranged from 1.43 to 6.27 (see Table 1 for means and t-test information). Examinations of the ranges suggest that the trait-behavioral statements are not all perceived as accurately representing the related traits, and that there are differences across behavioral statements with regard to the representative traits. In order to discover which trait-behavioral statements provided behaviors that were most representative of leadership traits, the data were analyzed by first conducting a one-sample t-test for each item (Scott & Brown, 2004). While Scott & Brown used a test value of 4.0 to indicate a significant difference above neutral, a test value of 4.5 was used for the tests in order to arrive at trait-behavior statements that were well above neutral.

The one-sample t-tests revealed that of the 56 trait-behavior statements that were rated, 36 of the statements were significantly different from 4.5, at the 0.05 level. Of the 36

significantly different statements, 21 were significant and in the desired direction, the rating

range of these statements was 5.27 to 6.53. The next analyses determined if each behavioral

statement was perceived differently across the two traits each statement was paired with. For

example, is there a significant difference between the rating of the statement of "Exhibits an

openness to the ideas of other people" when paired with the trait of "caring" or the trait

"charismatic?" Paired t-test revealed that 20 of the 21 pairs were significantly different from one

another at the 0.05 level. Of the 20 significantly different pairs, 18 were in the desired direction

where the intended trait was rated significantly higher than the non-intended trait. Fifteen of the

behavioral statements, representing 10 traits met the requirements. Within the traits with two

behavioral statements meeting the criteria mentioned above, the statement with the largest mean

difference on the paired-sample t-test was selected to represent the trait. The resulting 10 traits

and related behavioral statements are presented in Appendix C.

Of the traits selected, one-way ANOVA revealed two trait-behavior ratings that were

rated differently as a function of participant sex. The different ratings were for the behavioral

statements associated with honest and motivated. Another series of one-sample t-tests were

conducted on the data provided by male and female participants. For female participants, a

significant difference greater than 4.5 was found for ratings of the motivated ($t=8.96$, $p=.000$),

and honest ($t=6.79$, $p=.000$) behavioral statements. For male participants, a significant difference

greater than 4.5 was not found for ratings of the motivated ($t=1.386$, $p=.203$) and honest ($t=.559$,

$p=.592$) behavioral statements. While the male difference is not desirable, the number of male

participants is small and may account for the inability to find a statistically significant difference

in ratings.   Based on the small number of male participants, and the fact that the ratings were

still above the midpoint, the two trait-behavior statements were not excluded from the study.

Analyses of the items relating to the honor system found that on average, the students were familiar with the honor system in place at Virginia Tech (avg.=5.23, SD=1.14). With regard to the single sanction honor system ratings (avg.=3.67, SD=2.07), the ratings were significantly lower when compared to familiarity with the Virginia Tech system (t=-4.379, p=.000). Generally, while not as familiar to the participants, the single sanction system was not supported by the students (avg.=3.1, SD=1.81). The ratings were not significantly different as a function of participant sex.

Discussion

The trait-behavior pairs were presented in such a fashion that those trait-behavior pairs that were not the intended trait-behavior pairs were closely related to the intended trait-behavior pair. The decision to have highly related traits and behaviors linked to one another was based on the desire to determine which behaviors most saliently represent the traits. The 10 trait-behavior pairs that were selected seem to discriminate between traits and behaviors, as well as having behaviors that adequately represent the intended traits.

The issue of selecting a subject matter that was relevant to the student sample was less clear from the results. The average rating of the students with regard to the implementation of the single sanction system, and familiarity with the single sanction system indicate a relatively neutral position on the issue of the single sanction system. Because of pilot one's results, pilot study two explored the alternative topic of file sharing, as the issue may be more relevant to the student sample, and is one that is being actively addressed in universities across the nation and by the Recording Industry Association of America.

Pilot Study 2 - Stimulus Development

The main manipulation (VVBST) relied heavily on the observation of the behavior of potential leaders, in order to induce a participant to select a leader exhibiting behaviors that were cognitively misaligned or cognitively aligned, depending on the topic relevance to the participant. While pilot study one provided a foundation for understanding which behavioral statements represent leadership traits, pilot one does not provide information on how traits and/or behaviors are structured cognitively. In order to assess how the behaviors exhibited by leaders are related to the traits understood to represent leaders, the study described below provided insight on the trait and behavior linking between mental models, and provided a means of developing the prototypes for leaders exhibiting behavioral patterns that were either aligned with cognitive expectations, or misaligned with cognitive expectations. The study also assessed the relevance of file-sharing issues to the student sample used across all of the studies.

Participants

Sixty-nine undergraduate students (50 female, 19 male, avg. age = 19.52) participated in the study in exchange for extra credit in an undergraduate course. In order to achieve a participant pool that generally represented a university student sample, participants were at least 18 years of age and enrolled full-time in a four-year university during the regular academic year.

Materials

Participants performed a series of concept-rating tasks. The rating tasks were presented to participants via Dell workstations present in University computer labs. The rating tasks were administered using E-prime v 1.1 (Psychology Software Tools). There were two distinct rating tasks. One of the concept-rating tasks asked participants to rate the relatedness of $n(n-1)/2$ word pairs, based on the ten traits selected from the first pilot study, for a total of 45 trait pair ratings.

The other concept-rating tasks asked participants to rate the relatedness of n(n-1)/2 statement pairs, based on the ten behavioral statements selected from the first pilot study, for a total of 45 statement pair ratings (See appendix C for traits and behaviors). All of the ratings were placed in the context of thinking about how the concept pairs are related within the context of a student leader's behaviors or traits, and used the same scale as pilot study 1.

During the rating tasks, participants were presented with each pair rating, with the words/sentences centered horizontally on the screen. One of the pair items was presented in the top position, while the other was presented in the bottom position. For example, on the computer monitor, a participant rating the pair of "caring" and "charismatic" was presented with a statement about the rating context and task at the top of the screen, followed by a presentation of the rating scale. Beneath the statement and scale, participants were presented with the word "caring" horizontally centered on the screen and slightly above the center of the screen, while the word "charismatic" was centered horizontally and slightly below the center of the screen.

Participants used the keyboard to enter their numeric rating of the pair, at which point, the program presented the next pair to be rated. The rating task continued until all of the pairs in a concept-rating task were complete. There was not a time limit on the concept rating task, yet a response time was recorded along with the responses. Pair presentation was randomized within each concept-rating task, and the order of the two concept-rating tasks were counter-balanced so that half of the participants performed the concept-rating task related to traits first, and the other half performed the concept-rating task related to the behavioral statements first. In addition, if the trait term for "caring" was presented in the top position above "charismatic," the behavioral statement linked to "caring" was presented in the bottom position when presented with the behavioral statement related to "charismatic."

The cognitive task consisted of a word search exercise, which served as a distracter task between the two rating exercises. The word search was developed using an online word search tool and contained twenty words selected from wordsmith.org. The twenty words were selected based on the belief that they are words that are not used in everyday language and would not be highly familiar to the participants. The word list and the word search are presented in Appendices D and E.

The final section of the study asked the participant to provide responses to seven items addressing the relevance of file-sharing. A sample item was "Do you own an IPOD or other form of digital mp3 player?", with responses rated as either "yes" or "no." Participants were then asked to rate the extent to which they agreed with four statements. A sample item was, "I believe that downloading music without paying for the music is not stealing," with ratings made on a seven-point scale, with "1" representing "completely disagree" and "7" representing "completely agree." (See Appendix F for the survey).

Design and Procedure

The study was publicized through the Psychology Department's online Experimental Management System (Sona system) and interested students registered online through the system. The length of time designated to complete the experiment was 45 minutes.

After the participant registered for a scheduled participation time, he/she reported to the designated lab space in Williams Hall at the specified time. When the participant reported to the lab, each participant signed a consent form. The participant was then assigned a workstation. It should be noted that the experiment took place in a computer laboratory, where other participants were completing the same study at the same time. However, each participant progressed through the study independently at his/her computer workstation.

Each participant provided basic demographic information about sex and age; it was explained that this information was merely to describe the participants of the study, and would in no way be used to identify participants. Once all participants in a given session had submitted consent forms, been assigned a work station, and provided the demographic information, the experimenter provided the participants with two forms and a pencil. Participants were instructed to turn over the first form, and leave the second form face down beside their assigned workstation until instructed to turn the second form over.

The first form was a word list consisting of twenty words. Participants were asked to read through the word list and circle any of the words that they believe they could define. This provided participants with an opportunity to see the words used in the cognitive task to follow, as well as to test the assumption that the participants do not commonly know the words used in the word search. Upon completing the word definition task, participants returned the first form to the experimenter. The experimenter then instructed the participants to attend to the instructions on their computer screen and provided a brief orientation to the nature of the task and to clarify the progression of the study.

Participants were presented, via the computer, a brief introduction to the experiment and complete instructions for their participation. The instructions were as follows: "The following study will require you to complete a rating task, followed by a cognitive task, and then a second rating task. When completing the rating tasks, you will provide ratings based on your own perspective as a student at Virginia Tech. When providing ratings, please provide the rating that first comes to your mind, do not spend too much time deliberating the "right" answer, as there is none. To complete all three of the tasks, follow the prompts as given by the computer. At the beginning of each task, specific instructions will be provided to you via the computer. Thank

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you." Participants were asked to press the space bar when ready to continue with the study, at which time the first rating task began.

Participants were instructed to think about what it means to be a student leader, by either thinking of their own experiences as a student leader or working with a student leader. The rating task asked participants to rate a series of sentence pairs or word pairs as they relate to one another when considering what a student leader is. Specifically, the instructions stated the following: "Your task in this study will involve judging the relatedness of pairs of concepts. In making these types of judgments, there are several ways to think about the items being judged. For instance, two concepts might be related because they share common features or because they frequently occur together. While this kind of detailed analysis is possible, our concern is to obtain your initial impression of "overall relatedness." Therefore, please base your ratings on your first impression of relatedness. Each pair of concepts will be presented on the screen along with a "relatedness" scale. You are to indicate your judgment of relatedness for each pair by pressing a key on the keyboard. If you feel that the concepts are not related at all press "1" on the keyboard. If you feel the concepts are highly related you would press an "8" or a "9". You can think of these numbers as points along a "relatedness" scale, with higher numbers representing greater relatedness."

Participants were instructed to press the space bar to continue the study. Participants then rated the relatedness of 45 pairs, presented randomly to them on the computer monitor. Participants provided their responses using the keys corresponding to the numbers 1-9 on the keyboard based on the instructions provided at the start of the study. When the first rating task was complete, participants were provided instructions for the cognitive task. The specific instructions for this task are found in Appendix G.

When the word search time was complete, participants were directed to follow the instructions presented to them on the monitor. Participants were presented with instructions identical to those presented at the start of the first rating task. Participants proceeded with the second rating task, as they did with the first rating task. Trait word pairs were presented to those participants who rated sentence pairs first, and vice versa for those receiving trait pairs first. Upon completion of the second rating task, participants responded to the seven items about file-sharing, were verbally debriefed and thanked for their participation.

Results

The analysis of the networks was performed using the Knowledge Network Organizing Tool for IBM PCs (PCKNOT), Version 4.3 (Schaneveldt, 1998). Each participant provided responses that were used to generate two proximity data files. One proximity data file represented the cognitive relatedness of traits, and the other represented the cognitive relatedness of behavioral statements. First, all responses were coded to allow for comparative analysis between trait and behavioral proximity data files. Each trait-behavior pair was coded so that they were represented by the same number across the two files generated for each participant. For example, if the suggested trait-behavior pair was "Intelligent"-"Thinks quickly," then the terms were both assigned the same number in their respective data files (i.e., 4).

The next step was to test for coherence. Coherence analysis in PCKNOT addresses the consistency of a data set. The software developers suggest that low coherence values (i.e., .20 or less) indicate a lack of attention on the part of the raters. Participants (n = 19) who produced data files, either trait or behavioral networks, that exhibited a coherence at or below .20 were excluded from further analysis. In addition to the coherence assessment, it was determined that participants who produced networks with a number of links two standard deviations above the

average number of links were producing networks that were too ambiguous to meaningfully interpret. For example, one participant produced a network with 45 links, indicating that all of the concepts were highly related and producing a network that provided little discrimination between the concepts. Six of the participants produced networks (3 trait and 3 behavioral) that were two standard deviations above the average number of deviations. The average number of links in the trait networks was 14.7 links with a SD of 6.25. The average number of links in the trait networks was 13.83, with a SD of 4.74. Removing the participants with low coherence and excessive links left 45 participants (31 female, 14 male, avg. age = 19.62), and their respective networks.

From the 45 network pairs left, "average" networks for traits and behaviors were derived using PCKNOT. PCKNOT compiled the "average" network, by mechanically averaging across the selected proximity files, which has been demonstrated as a preferred method of deriving an average network (Day, Arthur & Gettman, 2001.) The average trait network produced nine links, as did the average behavior network, with respective coherences of .871 and .828. Comparison of the similarity of the two average networks revealed that there are six links in common and a network similarity of .50. The common links between the two average networks were between the nodes from understanding to caring, honest to caring, helpful to caring, dedicated to caring, dedicated to motivated, motivated to strong, strong to domineering, and domineering to manipulative. As shown in Figures 1 and 2, knowledge was not commonly represented across the two average networks.

With network analysis complete, the experimenter, to derive a second trait network that would be misaligned with the average trait network, reconfigured the average trait network derived from the student participants. The reconfiguration of the average trait network consisted

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of selecting specific nodes and moving them to locations in the network that would lead to the development of highly dissimilar networks. The experimenter developed a drawing of a misaligned network, and then a rating grid was developed and entered into the PC-KNOT program (See Figure 3). A similarity analysis was then conducted to reveal that the misaligned trait network, designed by the experimenter, exhibited a similarity of .20 when compared to the average trait network derived in the pilot study. In addition, the contrived network exhibited a coherence value of .71.

Next, analysis of the exploratory questions based on music downloading were analyzed in order to assess the relevance of the topic to the student sample. Analyses revealed that the percentage of students who own a digital media player, such as an IPOD or other mp3 player was 49%. In addition, 31% of the students reported using a pay or subscription service to download music, and 89% of the students reported using file sharing software to download music.

With regard to the issue of theft and the illegal downloading of music, the students revealed a somewhat ambivalent attitude when asked to consider whether file sharing is not stealing, with 53% of the students responding in the range of "completely disagree" to "neutral." The item that asked if file sharing is stealing elicited a clearer response, with 78% of the students responding in the range of "completely disagree" to "neutral."

The students provided a clearer indication with regard to whether or not the university should treat file sharing as theft. Only 11% of the students responded in the range of the scale that would indicate low to high levels of agreement with the university treating file sharing as theft. On the final item, only one student did not partially or completely agree that the university should provide an alternative to file sharing in the form of a free music service.

Discussion

Based on the results of the second pilot study, the script used in the development of the VVBST will focus on the status of file sharing at the university and the implementation of a free file sharing program at the University. The topic seems to be one that demonstrates a clear opinion in the mind of the students, with regard to the universities policy around the issue of file sharing. In addition, the topic is one that is being addressed at other universities across the nation.

Pilot Study Three - Stimulus Development

In order to assess the equality of the arguments for and against file-sharing, as presented in the VVBST, an online survey was conducted to distinguish if any of the points argued in the VVBST were too strong when compared to a counterpoint.

Participants

Twenty students enrolled at Virginia Tech (13 Female), participated in the pilot study by registering through the SONA system at Virginia Tech. Participants received one-extra credit for completing the study.

Materials

Participants completed an online survey, developed and presented via survey.vt.edu. The survey was based on a script for the VVBST that was developed from various resources (Boorstin, 2004, Blackburn, 2004). The survey presented six pairs of arguments, each consisting of one exchange of a point and a counterpoint (See Appendix H). Points and counterpoints were counterbalanced so that the pro-file argument and the anti-file sharing argument were equally presented as points and counterpoints. All of the six arguments were presented on one webpage, and participants were instructed to read the argument pairs, starting with the first, to provide

responses to the items listed after each argument pair. Participants were also instructed to not go back and change their responses, and to read the arguments in the order presented to them. These arguments were taken directly from the developed VVBST script. Participants read a complete point/counterpoint exchange and then responded to two items using a 5-point Likert-type scale.

Design and Procedure

Once registered for the study, participants were directed to an online survey.   After the participants had read the instructions and agreed to participate in the study, participants completed the survey. Upon completion of the survey, participants were thanked for their participation and directed to a debriefing page.

Results

The purpose of this study was to address two argument-based concerns. The first focused on the presentation of the arguments for and against file sharing, in particular, were both perspectives equally presented to the participants? The second issue reflected the personal bias that is inherent in argument evaluation, in particular, to what extent are personal beliefs influencing an individual's comparison of the arguments.

One item asked participants to indicate the extent to which they would agree with the following statement: "I believe that one of the arguments is stronger based on my personal beliefs." This item used a response scale identical to the first two items and the item was presented with each of the six arguments pairs. A one-sample t-test conducted against the value of three returned significant t-values across all six argument pairs. The value of three was selected so that a significant and positive difference would indicate that on average participants are indicating that they believe one of the arguments is stronger as a function of personal beliefs.

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All of the t-values were positive and significantly different from three. The means and t-test for this items are presented in Table 2. By collecting this information, the intention was to inform how biased the results of the final item may be.

The final item asked participants to directly compare the point and counterpoint, within each argument, against one another, and indicate if they perceived one point as stronger than the other. Because the presentation of points and counterpoints was counterbalanced across the arguments, arguments 2, 4 and 6 presented the anti-file sharing perspective as the "Point" and the pro-file sharing perspective as the "Counterpoint." These three items were reverse coded in order to place all responses to the final item in the same direction of either pro- or anti- file sharing across all six arguments. In order to test for the absence of neutrality, a one-sample t-test for was conducted for each item against the value of three. A t-value that was significantly different from three (neutral) would indicate that, on average, individuals were perceiving either the pro-file sharing argument as stronger than the anti-file sharing argument (in the case of a significantly different and positive t-value), or that the anti-file sharing argument was stronger that the pro-file sharing argument (in the case of a significantly different and negative t-value). None of the t-values were significantly different from three, indicating that there was not a significantly different bias across the six argument sets presented in the survey (see Table 3 for means and t-values).

Discussion

The t-tests conducted across the items for each of the six arguments indicate that, on average, people do not perceive inequality in the presentation of the points and counterpoints across the arguments. In addition, while there seems to be a tendency to allow personal beliefs to influence how participants perceive the strength of the arguments, on average there does not

seem to be a perception that one perspective (either pro- or anti-) is stronger, when compared

relative to one another. Based on these results, the experimenter concluded that the pro- and

anti- file sharing arguments are perceived as balanced. The script for the focal VVBST was

directly tested by this pilot study, and no significant changes were deemed necessary during the

filming of the VVBST for the focal study.

Focal Study

Participants

Ninety-three undergraduate students at Virginia Tech (54 female), aged 18 to 22 years

(mean =19.69), participated in the first part of the study, in exchange for one extra credit point in

a psychology course. In order to continue on to the second part of the study, participants were

required to exhibit a coherence value of .20 for the Pathfinder network derived from the ratings

of part 1 of the study. Briefly, the coherence value represents the extent to which an individual is

engaged in the task at time one. Eighty-six participants were eligible to continue with part two

of the study, while the remaining seven students (4 female) did not qualify for participation in

the second part of the study. Of the seven ineligible participants, four of the excluded were

Asian, representing all of the Asian participants from part one, based on the small sample the

removal of all Asian participants should not be considered as indicative of a specific concern

with Asian participants. Of the 86 students eligible to complete part two of the study, 75

students (43 female, M_{age} = 19.63) completed the second study, in exchange for one extra credit

point in a psychology course and entrance in a drawing for $25. Of the 75 participants

completing the study, one was removed for failing to follow the directions of the experiment, and

seven more participants were excluded from analysis due to low coherence during their second

visit to the lab, prior to their exposure to the stimulus video. The final usable sample size was 67

participants (39 female, M_{age} = 19.63). Thirteen percent of eligible participants did not return to

complete the second part of the study.

Independent Variables

Cognitive Aligned and Misaligned Perceptions of Leaders: The VVBST was designed to

present participants with the opportunity to select between two potential leaders, one exhibiting

behaviors that would be cognitively aligned, and another who exhibited behaviors that would be cognitively misaligned. These behaviors were based on the cognitive models developed during the pilot testing, and were presented during the script. While there was no method of measuring the actual real-time cognitive perceptions and representations of the various leadership behaviors presented during the video, cognitive representations were measured at different points in time (two pre-VVBST and one post-VVBST) in order to assess the extent to which participants were affected by the presentation of leadership behaviors.

Cognitive Engagement: The VVBST was designed to evoke varying levels of cognitive engagement in the leader selection task, as a function of the level of personal relevance perceived by the participants. To vary the level of cognitive engagement experienced by the participants, the argument presented in the VVBST focused on the topic file sharing and music downloading, as the pilot studies indicated that the topic was relevant to student participants, and that personal relevance on the topic varied across participants. The particular measure of personal relevance was based on the use of a paid music download service. This was selected as one of the main suggestions made in the VVBST was the introduction of a music service provided by the University. The experimenter assumed that individuals engaging in illegal file sharing would not be swayed by the particular arguments or suggestions made in the VVBST, as such individuals would already have made peace with their file sharing habits in order to diminish cognitive dissonance. Individuals who pay for their service are choosing to not rely solely on illegal services, for various reasons, and would personally benefit from the policy changes discussed in the VVBST.

Stimulus Video

The primary task of the study was the video-vignette behavior selection task (VVBST). The development of the VVBST was based on the outcome of three pilot studies discussed previously. The VVBST provided participants an opportunity to watch a three-member student panel discuss the merits of formulating a file-sharing policy at Virginia Tech. Within the video were the manipulations of the two factors of leadership behaviors and topic relevance. Leadership behaviors were presented to reflect a leader who was cognitively aligned and another with student view's of leadership who was cognitively misaligned. Topic relevance was presented to reflect an attitude that was anti-file sharing and reactive, versus an attitude that was pro-file sharing and proactive. As a point of clarification, originally the discussion was to focus on the implementation of a single-sanction honor system at Virginia Tech. However, the results of the first pilot study did not support the use of the honor-system topic. The two factors, behavioral and attitude, were crossed within the manipulation, so that the leader exhibiting cognitively aligned behaviors represented the anti-file sharing and reactive attitude, while the leader exhibiting cognitively misaligned behaviors represented the pro-file sharing and proactive attitude. To distinguish between the two leaders during further discussion, the label of "cognitive leader" represents the former, while the label of "relevant leader" represents the latter.

In particular, the issues in the video addressed focused on if file sharing should be treated as theft by the university, and if the university should be proactive in preventing the use of file-sharing software. The panel discussion was scripted so that one member of the panel was exhibiting behaviors, and a stance on the issue, that was non-committal and neutral with regard to leadership behaviors. The behaviors engaged in by the neutral panel member were based on previous research (Lord, Foti, & DeVader, 1984).

The structure of the video was scripted to provide two distinct segments, one focusing on the presentation of leadership behaviors, and the other focusing on topic relevance. The first half of the video focused on the presentation of leadership behaviors, while the second half focused on topic relevance through the presentation of the arguments and policy suggestions. In the first half, the exhibited behaviors were based on the trait networks that represent the cognitively aligned leadership network and the cognitively misaligned leadership network. The behaviors were presented in trait-behavioral clusters. For purposes of the video, a trait-behavioral cluster refers to the presentation of three behaviors that map on to three nodes from the network of traits of either the cognitively aligned leadership network, or the cognitively misaligned leadership network. In order to be selected for a cluster, the nodes had to be connected to one another in a chain (i.e., A → B → C). In addition, the clusters had to overlap between both leadership networks (aligned and misaligned), such that both clusters exhibited a trait grouping in which the cognitive leader and the relevant leader presented two similar behaviors and one unique behavior within the clusters. Table 4 provides a listing of how the behaviors were clustered within each of the two leaders. In addition to meeting the previously discussed requirements, the behaviors that were selected to represent the trait nodes had to be easily conveyed via video and demonstrate a trait-behavior link from the pilot testing.

In addition to the leadership behaviors presented by the cognitive leader and the relevant leader, they also present different perspective on the subject matter. The cognitive leader provided arguments that supports the position that file-sharing is theft and should be treated as such by the University. Counter to the theft perspective, the relevant leader argued that file-sharing is not theft and that the University should proactively embrace file-sharing by funding a digital music program. With regard to the positions held by the two leaders, the general

preferences of the student body at Virginia Tech, and the strength of the arguments, were assessed during the previously discussed pilot testing. The content and structure of the positions held by the two leaders were be derived from publicly available resources, that discuss the issue and acceptable approaches to addressing the issues.

The presentation of the panel discussion provided four points of view to the participants (see Figure 5). Within a four-panel grid, the area in the upper left hand corner of the screen presented a direct view of the cognitive leader. The grid area in the upper right hand corner of the screen presented a direct view of the neutral panel member. Beneath the neutral discussant, the relevant leader was presented in the lower right hand corner. The final panel, in the lower left hand corner, provided a group perspective of the discussion. The placement of the discussants in their respective corners reflected an attempt to place the relevant leader in a position that was non-dominant. As reading occurs from the upper left hand corner and progresses to the bottom right hand corner, the cognitive leader was placed in the upper left hand corner to support his selection as a leader. In addition to the specific placement, the grid panels were labeled from the upper left-hand corner in a clockwise direction with the following labels, "F," "H," and "K." The bottom left-hand grid panel was not labeled as it contained the full panel view of the discussion.

Excluding introductory instructions, the total length of the VVBST was 8 minutes and 56 seconds. During the task, the cognitive leader spoke 9 times for a total of 3 minutes and 56 seconds, with an average utterance time of 26 seconds. The relevant leader spoke 9 times for 4 minutes and 11 seconds, with an average utterance time of 27 seconds. The neutral panel member spoke 4 times for a total of 49 seconds, with an average utterance time of 12 seconds (Appendix I provides the script for the VVBST).

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The filming of the VVBST used three paid actors, who were upper level students at the University. Physically, the actors portraying the leaders were white males similar in age, build and height. The neutral panel member was a black male, of similar age and physique to the other panel members. The actors were paid $50.00 each for their time and services. The discussion was filmed using three digital video cameras and one ceiling mounted closed circuit camera. The four resulting videos were edited with Adobe Premiere Pro 6 software. The edited videos were prepared for computer display and burned to DVD for future display.

Measures

Student Leader Representation Networks

Forty-eight hours prior to performing the VVBST, just before and just after completing the VVBST, participants provided a series of ratings based on trait linked to the cognitive representation of leaders. Participants were asked to think about a student leader, either real or imagined, and to rate a series of concept pairs (i.e., "Honest" and "Caring") in terms of how related the traits are to one another when placed in the context of a student leader. Ratings were made on a nine- point scale with "1" representing "not at all related" and "9" representing "highly related." The list of trait pairs was based on the 10 traits selected from the pilot studies, and were paired in $n(n-1)/2$ combinations of two, for 45 pairs. Each pair was rated once and the order of the pairs were presented randomly to the participants using the Rate function of the PC-KNOT software package.

Topic Relevance Measure/File Sharing Attitude

Perceptions of topic matter relevance and attitude were measured by asking the participants to complete a brief survey (see Appendix F for the full survey). A sample survey item was, "Have you ever downloaded music through a payment or subscription service?"

Responses were either rated as "yes" or "no," or on a a seven-point scale, with "1" representing "completely disagree" and "7" representing "completely agree" for the items that reflected the level of participant agreement with statements such as "I believe that downloading music without paying for the music, is stealing."

Dynamic Leader Impression

During the course of the VVBST, participants were presented with a series of 22 tones. The tones were presented after each significant utterance, with a tone occurring about every 25 seconds, on average. When presented with the tones, participants used the keyboard to select the letter corresponding to the quadrant containing the individual that the participant would select as the leader at that point in time. Psychology Software Tools, E-Prime v 1.1. was used to collect all responses during the VVBST. This component of the task encouraged active engagement in the task, as such, the responses were not actively used to test any hypotheses.

General Leadership Impression

After completion of the VVBST, participants completed three General Leadership Impression Scales (GLI), one for each panel member (See Appendix J for GLI). Each of the GLI's were presented to the participants using Psychology Software Tools, E-Prime v 1.1. While completing each GLI, participants were presented with an image of all three discussants and their names. The presentation of the images represented where each discussant was presented during the VVBST. The order of GLI completion was randomly generated for each participant. The scale is a seven-item measure with a demonstrated reliability above the .85 range (Smith & Foti, 1998; Zaccaro, Foti, & Kenny, 1991), responses are recorded on a five-point rating scale, with "1" representing "Nothing" and "5" representing "Extreme Amount." A sample item is "How much did this member encourage the contributions of other group

members?" Alphas for the three GLIs were cognitive leader alpha = .86; relevant leader alpha = .87; neutral member alpha = .86. All relevant correlations, means and alphas are presented in table 5.

Supplementary Information

Additional information about the age, sex, and enrollment status of the participants was collected at the beginning the study. Participants also provided information about how they perceived themselves as student leaders.

Manipulation Checks

The contrived leader selection scenario was designed to accomplish two tasks. The first was to provide participants with two leaders to select from, one that was exhibiting cognitively aligned behaviors, and one that was exhibiting cognitively misaligned behaviors. The second was to present participants with a scenario that would be either high or low in personal relevance, which would lead to different levels of cognitive engagement. The following analyses attempt to assess the extent to which the leader selection task accomplished the two tasks.

While there was no direct method of measuring exactly how participants were interpreting and recognizing the behavioral patterns of the leaders presented to them during the VVBST, similarity values were calculated between the pre-VVBST measures of the participants' cognitive representations of a leader and the two pathfinder models (aligned and misaligned) used to construct the VVBST. The pathfinder model that guided the cognitively aligned behavioral patterns exhibited in the VVBST demonstrated a higher level of average similarity with participant cognitive models ($M = 0.36$), than with the cognitively misaligned pathfinder model ($M = 0.19$; $t = 10.37$, $p = .00$). To place the average similarity with the cognitively aligned behavioral model into context ($M = 0.36$), 2701 similarities were calculated from 74 of

the networks derived during the course of the experiment resulting in an average similarity of 0.31, which is significantly different and lower than the average similarity with the cognitively aligned behavioral model (t = 3.37, p = .00). This result suggests that the models used to guide the VVBST were accurate in terms of achieving the desired levels of similarity across the participant models and the manipulated models.

Topic relevance was designed to induce variability in the levels of cognitive engagement, either automatic or controlled, that participants were experiencing during the presentation of the VVBST. Again, while there was no direct measure to determine to what extent individuals were engaging in automatic or controlled processing, research in memory retrieval and access has demonstrated that individuals engaged in retrieval tasks using controlled processing will exhibit slower response times than those using automatic processing (Vonk & Horton, 2006). As response time data was collected during the VVBST, it is reasonable to assume that during the leader selection component of the task that individuals who are using a more controlled process will exhibit slower average response times than those engaged in automatic processing.

In order to test the presence of differences in cognitive engagement, the response times to the 22 audio cues presented during the presentation of the VVBST were collapsed into four time blocks. Collapsing response time data into blocks is a common practice in evaluating response time differences (Willingham, Nissen, & Bullemer, 1989). Block 1 represents tones 1 thru 5, block 2 represents tones 6 thru 10, block 3 represents tones 11 thru 16, and block 4 represents tones 17 thru 22. As the first half of the video was designed to be neutral, with regard to personal relevance, the expectation was that individuals in low and high relevance groups would not exhibit a mean difference in their average response times across the first two blocks. As the topic of file sharing was actively presented during the third block, with the relevance topic being

presented during the fourth block, response times are expected to begin diverging during the last two time blocks, as a function of topic relevance.

For purpose of clarification, response times are traditionally measured as the time in milliseconds that it takes an individual to respond to a presented stimulus. The constraints of the presentation format used in the VVBST did not allow for the collection of stimulus response time data as it is traditionally practiced. Instead, the label of response times here reflects the amount of time recorded between two consecutive tone responses. Such that, when a participant responds to tone 1, the clock time that the response occurred was recorded, and then recorded again at the response to tone 2, this would provide a single response time between tone 1 and tone 2. Based on this, response times varied as a function of two factors, the amount of time passed between tone presentations, and the amount of time that it took a participant to record their response. What was constant across all participants was the presentation of tones, as the same video was shown to all participants. While it would be most desirable to have a response tone time that reflected the amount of elapsed time between the presentation of the tone in the video, and the actual participant responses, this was not possible based on how the VVBST was presented to participants. While not the ideal response time measure, one could reasonably expect that individuals more cognitively engaged in the VVBST would exhibit longer periods of time in between consecutive tone responses, based on the fact that engaged participants were thinking more about their responses.

With the response time information available from the participants, a repeated measures analysis of variance demonstrated that across the four response time blocks, the average response time was significantly different as a function of topic relevance. The significant interaction ($F = 4.43$, $p = .02$), along with Figure 4 demonstrates that during the block of tones designed to evoke

the most cognitive engagement in those participants who would perceive the topic as relevant, the average response time was higher than those who would not see the topic as particularly relevant. For further clarification, Figure 4 provides information on the response times for individuals in the high relevance and low relevance groups, as well as information on the time between the presentation of the tones during the video. Inspection of Figure 4 reveals that across blocks 2 and 3, participants are responding at a time that corresponds with, or anticipates the presentation of the tone. This finding was not surprising as the tones were always presented after a video discussant finished his point. The fact that the low relevance group continues to demonstrate an anticipatory effect, and that the high relevance group increases in their response times at block 4 supports the belief that high relevance participants are engaged in a more controlled cognitive process.

Design and Procedure

A repeated measures within-subjects design was used, with data collected during two points in time, approximately 48 hours apart. The design collected cognitive data at time one and at the beginning of time two, in the absence of a specific stimuli, in order to establish a baseline measure of participants' cognitive representations of leadership. Participants were then exposed to the stimulus manipulation of the leadership behaviors and topic relevance, followed by a measure of their cognitive representation of a leader. Participants were recruited using the Psychology Department's Participant Pool, supported via the Sona System. Participants registered for the study online, and selected two time periods for their participation. Upon entering the computer lab for the first data collection session, participants were provided informed consent information and directed to a computer workstation.

When the informed consent procedure was complete for all timeslot participants, the

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experimenter read a standard set of instructions (see Appendix K for Part 1 Instructions). Upon completion of the oral instructions, participants began the concept-pair rating task. Additional instructions were presented via the PC-Knot program (see Appendix L for PC-KNOT instructions).

Participants then completed the concept pair-rating task. Upon completion of the concept pair rating task, the experimenter used PC-Knot to calculate a coherence value for the network generated by the participant. Participants who generated a network with a value below .20 were thanked for their participation and informed that they would not be eligible to participate in the second part of the study. Participants with a coherence value of .20 or above were thanked for their time and reminded of their appointment 48 hours later. Again, the PC-Knot manual suggests that individuals not engaged in the task will produce a coherence value below .20, so the value was used as such.

Upon returning for the second part of the study, participants were directed to the computer that they were seated at for their first visit to the lab. Each participant was seated an individual table that held two computers. When all of the participants were seated, a set of standard instructions were read by the experimenter (see Appendix M for Part 2 Instructions).

Participants then completed the concept pair-rating task as performed during their first visit. When a participant completed the concept pair rating task, they moved to the computer at his/her table that was directly to their left or right. When the participant moved to the other computer, they completed the measure of topic relevance. When all participants had completed the measure of topic relevance, the experimenter began the VVBST, which provided audio instructions on the task and how many responses the participants were to make. A description of the audio instructions are provided in Appendix N.

The video related to the VVBST was projected to the front of the room, and the audio was presented to all of the participants via external speakers connected to the projector. In the introduction to the VVBST, participants were oriented to the configuration of the video presentation of the discussion. Participants then completed a brief response location orientation task which required them to respond to three tones and to press the response location indicated by the projected video. Upon completing the response location orientation, the VVBST began. During the presentation of the VVBST, participants were also presented with an identical response grid on the computer monitor in front of them. After completing the VVBST, participants then selected the panel member they would endorse as the leader, and completed the GLI for each of the three panel members.

With the VVBST completed, participants returned to the computer used to complete the first rating task, and completed their second concept pair-rating task of the day. The instructions for the task were near identical, with the exception that the instructions asked participants to provide their responses in the context of the individual panel member they endorsed as a leader. When the third task was complete, participants were thanked for their time, and provided debriefing information (Appendix O).

<div align="center">Results of Focal Study</div>

One of the primary analysis tools is the PC-Knot program. PC-Knot is often used to generate Pathfinder models which are used to provide a graphic representation of an individual's cognitive model. However, PC-Knot also allows for the computation of three important values. The three values calculated by PC-Knot are cohesion, similarity, and correlation. The cohesion value assesses the extent to which an individual's network is transitive. By means of explanation, a transitive relationship is reflected when "a" is equal to "b" and "b" is equal to "c",

meaning "a" is equal to "c." If an individual repeatedly violates this logic, then they would produce a network with lower cohesion. Similarity is calculated in a fashion that evaluates the layout of node connecting links in a cognitive model, and calculates how the links of one layout correspond to the layout of another cognitive model. The third value is more straightforward, in that it calculates the correlation between two networks by averaging the correlations between the sets of concept pairs relatedness ratings that underpin the cognitive networks.

Analysis of Focal Study Part One

The first component of data analysis occurred when participants completed the first network task during part one of the study. The coherence measure (M = .53) for each participant was calculated by the experimenter using the PC-Knot program. Participants with a coherence value below .2 (N = 7, M = .028), were informed that they were not eligible to return for the second part of the study. Of the remaining participants, one additional participant was removed from data analysis due to not following the directions during the study, resulting in completing the study out of order.

Analysis of Focal Study Part Two

Similar to part one of the focal study, participants producing low coherence values were excluded from data analysis. As participants had an incentive to perform well during the first part of the study, which was to perform well or not return, the experimenter wanted to remove any participants who returned but were no longer as engaged in the task. By focusing on the coherence values of the networks produced at the beginning of the second part of the study, pre-stimulus, the experimenter removed seven more participants, leaving a final usable sample size at 67. The seven participants who were excluded had an average network coherence of .41

during part one of the study, and an average network coherence of .01 during the pre-stimulus measurement from second part of the study.

Topic relevance was assessed using the single-item measure of how often an individual used a music downloading service. This item was selected because of the suggestion of the relevant leader was to implement a free downloading service, while not actively treating file sharing as theft. The approach of the relevant leader would generally align with the general file sharing attitude of most of the participants, yet significantly impact the downloading practices of those using a subscription service. The relevant leader's suggestion would reduce the cost of downloading music, so those individuals who pay for their music would receive a break (high relevance), while those downloading music without paying would experience no change in their treatment (low relevance). Using the information on how often a participant has engaged in downloading music from a service, 38 participants indicated that they had never downloaded music through a service. The remaining 29 participants indicated that they had downloaded music through a service, occasionally to frequently. As a result of this item, 38 participants were placed in the low topic relevance group and 29 participants were placed in the high topic relevance group.

Analysis of Hypothesis 1

Hypothesis 1 suggested that individuals in high relevance conditions will select a leader that presents the argument that aligns more with a personal belief, and not necessarily the leader who ordinarily aligns with cognitive expectations. In addition, the hypothesis suggests that individuals in low relevance conditions will not exhibit a preference for a leader based on argument, but instead select the leader who matches their cognitive expectations. In order to test Hypothesis 1, a Repeated-Measures ANOVA was conducted with the GLI ratings of the

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cognitive leader and the relevant leader as the repeated measures variable and relevance (high and low) as the factor.

The results of the ANOVA suggest a significant interaction effect (F = 5.44, p = .02) between the GLI ratings of the two leaders and the relevance factor. The repeated-measures variable was not significant (F = .058, p = .45). Table 6 provides ANOVA test information, and Figure 6 provides a graphic representation of the interaction effect. The figure supports the assertion that individuals in the high topic relevance category perceived the relevant leader as more of a leader than the cognitive leader, while individuals in the low relevance category perceived the cognitive leader as more of a leader than the relevant leader.

Analysis of Hypothesis 2

In order to test Hypothesis 2, a repeated-measures ANOVA was conducted using the repeated measures of the similarities between the three cognitive networks provided by each participant and the cognitive network of the "cognitive leader." Topic relevance was selected as the between-subjects factor, because Hypothesis 2 suggests that being more actively engaged in identifying a leader will cause a fluctuation in the cognitive structure of a leader. The results suggest several things, first the repeated measures factor demonstrates a significant mean difference (F = 5.53, p = .05), and a significant interaction effect between the repeated measures and the topic relevance factor (F = 3.06, p = .05). Mauchly's test of sphericity was not significant (p = .15), suggesting that the homogeneity assumption was not violated. Table 7 provides ANOVA information, while examining Figure 7 reveals that individuals in the high relevance category are exhibiting a significant decline in their alignment with the cognitively-aligned leader network, while those in the low relevance condition are exhibiting a trend that appears as more linear. The results of the ANOVA provide support for Hypothesis 2.

As over fifty percent of the participants (n = 37) included in the data analysis identified themselves as leaders, additional analyses were conducted to determine if non-leaders and leaders varied on the dependent variables, as a function of being a leader or non-leader. Independent sample t-tests reveal that there is not a significant difference in how leaders and non-leaders perceive either the cognitive (t = .28, p = .78) or relevant leader (t = 1.55, p = .13). Leaders were also not significantly different from non-leaders with regard to their average similarity across the three measurement points (t $_{pre-1}$ = .03, p = .98 ; t $_{pre-2}$ = .46, p = .65; t $_{post}$ = -.46, p = .65) across the dependent variable in Hypothesis 2. Table 8 provides means and t-test information for the leader and non-leaders tests.

Discussion

The purpose of this study was to demonstrate that beyond the theoretical suggestions made by leadership researchers (Lord et al, 2001), Connectionism is a viable approach that allows a more nuanced understanding of leader representation and impression formation. In particular, the study sought to demonstrate that some of the suggestions that Connectionism makes, in particular, the dynamic nature of understanding (Lord et al, 2001; Read & Miller, 1998). In addition to demonstrating the dynamic nature of our leader representations and impression formation another important focus was to demonstrate how Connectionism fits into the current literature of ILT (Zaccaro et al, 1991; Epitropaki & Martin, 2005). Generally, this study was an attempt to be one of the first tests of Connectionism and leadership, as well as offering a more explicit framework for where Connectionism fits with previous ILT research.

Leadership and Connectionism Findings

The expectations of the study were to find that individual perceptions of leaders would not be based solely on the expectations of implicit leadership theory. The study suggested that our leadership perceptions are at times stable, yet will behave dynamically under specific conditions. The findings of this study provide support for the assertions made by the experimenter and the connectionist perspective on leadership, while allowing for the continued support of implicit leadership theory.

As an integration of connectionism and implicit leadership theory would suggest, individuals who have a personal stake in the recognition of a leader, are more likely to perceive a leader based on personal belief and not leadership expectations. When the personal stake of leadership recognition is low, then the evidence from this study and implicit leadership theory

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suggests that individual's will recognize the leader based on cognitive expectations, and not the specific stance or message of a potential leader.

These findings indicate that context is an important and influential variable that determines how we understand the leaders that we are exposed to. Context influences our selection of leaders, as well as the underlying cognitive ruminations that are suggested to support our recognition of leaders. The suggestions of the connectionist approach centers around the idea that our cognitive understanding of a leader is dynamic and is created on the fly as a situation dictates the need for a cognitive understanding of a leader (Lord et al, 2001). Hypothesis two supports this connectionist perspective on the dynamic nature of our cognitive networks (mental models), by demonstrating that across context free scenarios, individuals exhibit a relatively high level of similarity with the cognitive leader network. However, the introduction of contextual variables leads to a decrease in similarity for those individuals in the high relevance group, while individuals in the low relevance group remain relatively unchanged. These findings suggest that individuals may engage in more effortful processing when faced with a personally relevant context, yet those faced with a low personal relevance context would just apply their standard context-free cognitive expectations for a leader.

Based on these findings, there is support for the integration of the connectionist approach within the greater context of Implicit Leadership Theory. Connectionism does not contradict the idea that ILTs are relatively stable across time (Epitropaki, 2004), in part because the measurement of ILTs are relatively context free. When an important context is introduced, as was done in this experiment, cognitive representations of a leader shift. While this test did not measure a context-free cognitive representation in the days following exposure to the stimulus, the experimenter believes it is reasonable to suggest that the cognitive representations of the high

relevance individuals would fall back in line with their cognitive representations from the pre-stimulus measures. This belief is based on the demonstration of ILT stability across time, and that a significant permanent change would require an event or context that was much more meaningful to the participants.

Limitations

As with any attempt to study the inner workings of the human mind, the main limitation is the level of inference one can make when looking at the results of one study. In this particular study, several possible study limitations may have served to diminish the effects witnessed in the study, as well as the strength of the inferences one should make. The first limitation is that offered by the lab setting. Some would consider asking participants to believe that their leader selections have real meaning in a lab setting to be "wishful thinking," and as such, the perceptions of leaders may not conform to what would occur in the real world. The controlled setting of the lab reduces any attempt to make a stimulus, or decision made in the lab, seem as meaningful as one made in the context of the real world. In addition to the lab setting, it was not possible to measure the real time models of the participants. While participant responses to the tones embedded in the video may provide insight in the movement from perceiving a specific leader to another leader, the task component was designed to encourage active engagement in the leader perception task, and not specifically to model each individual's changing leadership perceptions. Another limitation is the generic networks provided as the models for the leader behaviors displayed in the video. Because of the attempt to make the cognitively-aligned leader fit as broadly as possible, participants idiosyncratic differences could not be taken into account when providing a situation that placed two concerns in competition with one another. The placement of the leaders during the VVBST was not counterbalanced, so that the cognitive

leader always appeared in the upper left hand corner of the screen. While it may have been desirable to vary the position of the cognitive and relevant leaders, the high potential for losing participants as a function of attrition over time, and low cohesions, would have required recruiting close to 200 participants. The belief of the experimenter is that by placing the cognitive leader in the upper left hand corner of the screen, the relevant leader was being placed at a disadvantage.

Another important limitation was the use of a single item measure of relevance. In hindsight, the topic relevance measure should have included multiple items that attempted to tap into the same construct. The rationale for not including a longer measure of relevance was based on the experimenter's desire to not prime participants to the specific point of the manipulation. Given the concerns of sensitizing the participants, the experimenter made the decision to focus on a small number of items, and on single items for determining relevance.

A final limitation concerns the lack of demonstration that the cognitively-aligned leader would be the preferred leader in a context free situation. As the majority of the participants selected the attitude-aligned leader, even though the majority of the participants were in the low-relevance category, suggests that the representation of a cognitively-aligned leader may not be as salient or as aligned as the experimenter had hoped. In order to gain confidence in the findings of the study, the experimenter recommends first addressing this limitation by providing a similar study design that provides a more context free perception of the leadership behaviors displayed in the VVBST.

Future Research

While this study is an early foray into the realm of integrating the connectionist approach to leadership, this study provides a great opportunity for not only replication, but expansion, and

the resolution of questions that arise from the integration of connectionism and leadership research. Future research should seek to understand how connectionism sheds light on the selection of leaders at various levels, personal, professional or political. As well, we should explore connectionism in social psychology, and in particular leadership research and theory, at the natural interface that occurs between neuropsychology and connectionism. Other questions raised from the findings of this research are related to the nature of structural change and understanding when a cognitive understanding of a leader has been settled on.

While outside of the normal realm of social psychology, the use of functional magnetic resonance imaging to understand the neural activation occurring during periods of motivated behavior is not uncommon in the study of psychiatry or neuropsychological processes (Liddle, Laurens, Kiehl & Ngan, 2006). As connectionism has roots in the modeling of neural connections, and previous work has identified how the brain works to interpret events that are novel or motivating, as well as how the neural structures work during the processing of such events (Mesulam, 1998), then a valid idea would be to more directly capture the various levels of processing that occur when thinking about a leader. Using a well-constructed and contrived situation, in conjunction with fMRI, may lead to some interesting findings to support or question the suggestions of connectionism.

Moving outside of the laboratory and the use of contrived situations, there are many opportunities which would lend themselves to the exploration of how we recognize a leader. Using similar pre- and post- measures, one could focus on the selection of leaders that occurs when professional organizations select leaders. Using professional organizations would allow for the selection of a leader to occur from a group of relative unknowns, and one in which the members would have varying levels of interest in the selection of a leader. In addition, as this

manuscript is being written, the next presidential election is just over two years away, and promises for the emergence of very interesting messages. Both political parties seem to be struggling with their messages, and within each party there is a good deal at stake. Given the potential confrontation between sides within each party, it may be revealing to see how political leaders who may be identified as relatively homogenous (i.e., Democrat or Republican), would separate out based on the importance of issues within each party.

In her 2002 article, Queller discusses two interesting questions related to her modeling of a connectionist network and the functioning of stereotypes. Particularly, Queller attempted to understand how much information is needed for the structure of a stereotype to change. This question is clearly relevant to the suggestions made here. How much information is necessary for a connectionist representation to vary from what would be most common, to one that is structurally different in terms of connections and unit weights between the connections. The other question raised by Queller relates to understanding when a cognitive representation settles.

Though there was no attempt to measure when participants felt like they understood the leader they would choose, an appropriate research extension would attempt to capture the moment when a representation has settled. For example, at what point did the individuals in the low and high relevance conditions settle on their representation of the leader? Understanding when people settle on a representation would provide more valuable insight into our understanding of leader representations.

Outside of the examples from above, another interesting question that emerges from the proposed integration of Connectionism and ILT deals with how well the measures of cognitive networks correlate with measures of ILT. An important next step would seek to demonstrate that context free measures of cognitive networks correlate highly with the established measure of

ILT, and that there are breakdowns in the demonstrated consistency of ILT measures as a function of contextual factors and importance. There is no doubt that future work should be conducted to address the above questions, and additionally test the limitations of the present study.

Implications and Conclusions

Even in the face of the limitations of the current study, the premise of this study was to demonstrate that the integration of connectionist theory into the realm of leadership is important and meaningful. The experimenter is optimistic that this study offers strong inferential support for the integration of the theory of Connectionism into theories that deal with our perceptions of leaders, and in particular, with ILT. While some will question the strength of the inferences made in this paper, the expectation is that time will peel back the layers and reveal that the inferences made here are valid.

Clearly, more research is needed to strengthen the inferences made from the current study, and more research in general is needed to provide more evidence for the role of Connectionism. While conducting research in the cognitive domain requires a high level of faith in the measures, manipulations, and inferences made by the experimenter, the hope is that more work will reveal that our cognitive representations of leaders are not necessarily static structures. In addition, the results of this study suggest that leadership researchers should be cautious when collecting data that is free of meaningful context, which is common in our laboratory studies, and always be aware that there context is a powerful and relevant filter of perception and understanding.

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Table 1

Ratings of Trait-Behavior Statements and Paired t-tests

	Representativeness Ratings	1-Sample t-tests	Paired t-tests
Caring (vs. Charismatic)			
Exhibits an openness to the ideas of other people	5.23 (4.00)	3.02* (-2.06)*	4.63*
<u>Responsive to the feelings of the other people around them</u>	6.03 (4.43)	8.13* (-0.35)	5.52*
Charismatic (vs. Caring)			
Can motivate other people to pursue the same goals	4.90 (3.50)	1.49 (-3.49)*	3.81*
Articulate when speaking with other people	4.80 (3.38)	0.91 (-4.31)*	4.80*
Dedicated (vs. Strong)			
<u>Works hard to complete a task</u>	6.63 (3.70)	17.47*(-2.74)*	10.07*
Will sacrifice their personal interests to focus on the interests of other people	3.79 (3.17)	-2.50* (-4.51)*	1.43
Strong (vs. Dedicated)			
Will not easily give up on a point of view that they advocate	5.27 (6.03)	2.97* (8.42)*	- 3.36*
<u>Will stand alone and not conform to the majority</u>	5.27 (3.77)	2.83* (-2.05)*	3.98*

Table 1 cont.

Ratings

	Representativeness Ratings	1-Sample t-tests	Paired t-tests
Domineering (vs. Masculine)			
<u>Values having power over other people</u>	5.83 (3.43)	4.91* (-3.95)*	7.11*
Will aggressively pursue a goal or task when they believe it needs to be done	4.83 (3.60)	1.25 (-3.15)*	3.65*
Masculine (vs. Domineering)			
Will not openly express emotions or concern for others	3.97 (3.63)	- 1.74 (-3.17)*	0.95
Will display anger when challenged by someone	3.70 (4.47)	- 3.04* (-0.12)	- 2.32*
Energetic (vs. Motivated)			
Will display enthusiasm when speaking about their goals	5.37 (6.17)	4.20* (13.06)*	- 3.25*
Will help encourage others to start working toward a goal they have in common	5.10 (5.37)	2.35* (3.99)*	- 0.98
Motivated (vs. Energetic)			
Wants to immediately begin working on assignments	5.90 (4.07)	7.99* (-1.55)	6.86*
<u>Has a clear goal that they want to achieve</u>	6.17 (3.90)	9.61* (-2.14)*	6.76*

Table 1 cont.

Ratings

	Representativeness Ratings	1-Sample t-tests	Paired t-tests
Helpful (vs. Understanding)			
Will actively support other people	5.67 (4.70)	5.15* (0.79)	3.48*
Offers to assist other people around them	6.40 (4.57)	10.03*(0.41)	7.22*
Understanding (vs. Helpful)			
Will encourage honest and fair communication when conflict occurs	4.77 (4.79)	1.25 (1.68)	- 0.26
Will actively listen to the ideas of other people	5.70 (4.73)	6.43* (1.30)	4.45*
Honest (vs. Manipulative)			
Will speak openly and honestly about their ideas and beliefs	5.77 (2.57)	5.55* (-5.84)*	7.74*
Will not take credit for the ideas of other people	6.10 (1.93)	5.78* (-12.30)*	10.86*
Manipulative (vs. Honest)			
Will make empty promises in order to gain assistance from others	5.67 (1.43)	4.49* (-17.29)*	11.73*
Will put people in conflict with one another in order to meet their needs	5.70 (2.27)	3.86* (-7.88)*	7.52*

Table 1 cont.

Ratings

	Representativeness Ratings	1-Sample t-tests	Paired t-tests
Intelligent (vs. Knowledgeable)			
Will make decisions that accurately address an issue	4.87 (5.27)	1.77 (3.49)	- 1.80
Can think quickly when questioned	4.67 (5.00)	0.66 (2.46)	- 1.78
Knowledgeable (vs. Intelligent)			
Demonstrates a high level of understanding and is successful working in areas related to that understanding	6.03 (5.97)	7.44* (7.32)*	0.27
Has prior experience that allows them to perform at a higher level than those with less experience	5.37 (4.63)	4.10* (0.51)	2.48*

Notes: *p < .05. Behavioral statements under each trait were intended to represent the trait. Traits in parentheses represent the other trait that behavioral statements were rated against. One sample t-tests assessed neutrality, and were conducted against 4.5 (Scott & Brown, 2004). Paired t-tests tested if behavioral statements were perceived as more representative when paired with the intended trait, rather that with the unintended trait. Underlined statements are those selected for inclusion in pilot study 2.

Table 2

One-sample t-test Evaluating Influence of Personal Beliefs in Argument Evaluation

Argument number	Mean rating	t-value	p
1	0.70	3.62*	.00
2	0.75	3.94*	.00
3	1.05	7.77*	.00
4	0.80	4.66*	.00
5	0.70	3.62*	.00
6	0.85	3.85*	.00

Note. Positive rating values indicate that personal beliefs influenced argument evaluation.

t-test conducted against value = 0.

*p < .05.

Table 3

One-sample t-test of the Relative Strengths of Pro- and Anti-File Sharing Arguments

Argument number	Mean rating	t-value	p
1	0.15	0.72	.48
2	0.05	0.18	.86
3	0.50	1.88	.08
4	0.20	0.85	.41
5	- 0.30	- 1.30	.21
6	0.26	0.89	.38

Note. Positive rating values indicate that pro-file sharing arguments are perceived as stronger than the anti-file sharing arguments, negative values indicate the opposite.

t-test conducted against value = 0.

*p < .05.

Table 4

Trait-Behavior Cluster Presentations During the VVBST

Leader	Behavior 1		Behavior 2		Behavior 3	Tone Number
Cognitive	Strong	→	Motivated	→	Dedicated	2
Relevant	Strong	→	Caring	→	Helpful	3
Cognitive	Caring	→	Helpful	→	Honest	5
Relevant	Dedicated	→	Motivated	→	Honest	6

Note. Tone number indicates the response tone that followed the presentation of a trait-behavior cluster.

Table 5

Correlation Matrix of Variables

	Mean	SD	1	2	3	4	5	6	7	8	9	10	11	12
1. GLI-Cognitive	4.00	0.63	*0.86*											
2. GLI-Neutral	2.08	0.59	-0.40*	*0.86*										
3. GLI-Relevant	4.04	0.64	0.20	-0.21	*0.87*									
4. Coherence Pre-1	0.59	0.19	0.04	0.17	-0.09	~								
5. Coherence Pre-2	0.65	0.18	-0.06	0.23	-0.04	0.54*	~							
6. Coherence Post	0.59	0.27	-0.02	0.22	-0.12	0.49*	0.62*	~						
7. Sim Pre-1 & Pre-2	0.38	0.12	-0.21	0.06	-0.06	0.10	0.09	0.02	~					
8. Sim Pre-2 & Post	0.39	0.13	0.09	-0.04	-0.01	-0.02	0.01	0.21	0.29*	~				
9. Sim Pre-1 & Cognitive	0.36	0.11	-0.01	0.08	0.10	0.09	-0.03	-0.19	0.20	0.03	~			
10. Sim Pre-2 & Cognitive	0.37	0.13	-0.09	0.04	0.03	-0.14	-0.08	-0.06	0.18	0.38*	0.29*	~		
11. Sim Post & Cognitive	0.31	0.13	0.00	-0.03	-0.08	-0.06	-0.04	0.18	0.26*	0.61*	0.09	0.48*	~	
12. File Sharing Attitude	8.11	2.97	-0.10	-0.10	-0.19	-0.12	-0.17	-0.22	-0.17	0.08	-0.08	0.22	0.12	*0.81*

Note: Correlations marked with an asterisk are significant at the level of $p < .05$.

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Table 6

Repeated Measures Analysis of Within-Subject Effects of Relevance on Participant Ratings of

GLI for the Cognitive and Relevant Leader

Source	df	F	p
Between subjects			
Topic relevance (R)	1	0.16	.69
Error	65	(0.49)	
Within subjects			
GLI ratings for both leaders (G)	1	0.58	.45
G x R	1	5.44*	.02
Error	65	(0.30)	

Note. Values enclosed in parentheses represent mean square errors.

* $p < .05$.

Table 7

Repeated Measures Analysis of Within-Subjects Effects of Relevance on Participant Cognitive

Network Similarity with Cognitive Network for the Cognitive Leader

Source	df	F	p
Between subjects			
Topic relevance (R)	1	.907	.35
Error	65	(.03)	
Within subjects			
Similarity across time (S)	2	5.53*	.01
S x R	2	3.06*	.05
Error	130	(.01)	

Note. Values enclosed in parentheses represent mean square errors.

* p < .05.

Table 8

A comparison of leaders versus non-leaders to detect dependent variable differences

Dependent variable		Mean	t-value	p
GLI Ratings of Cognitive Leader	Leader	4.02	0.28	0.78
	Non-Leader	3.98		
GLI Ratings of Relevant Leader	Leader	4.15	1.55	0.13
	Non-Leader	3.91		
Similarity with Cognitive (Pre-1)	Leader	0.36	0.30	0.98
	Non-Leader	0.36		
Similarity with Cognitive (Pre-2)	Leader	0.37	0.46	0.65
	Non-Leader	0.36		
Similarity with Cognitive (Post)	Leader	0.31	- 0.46	0.65
	Non-Leader	0.32		
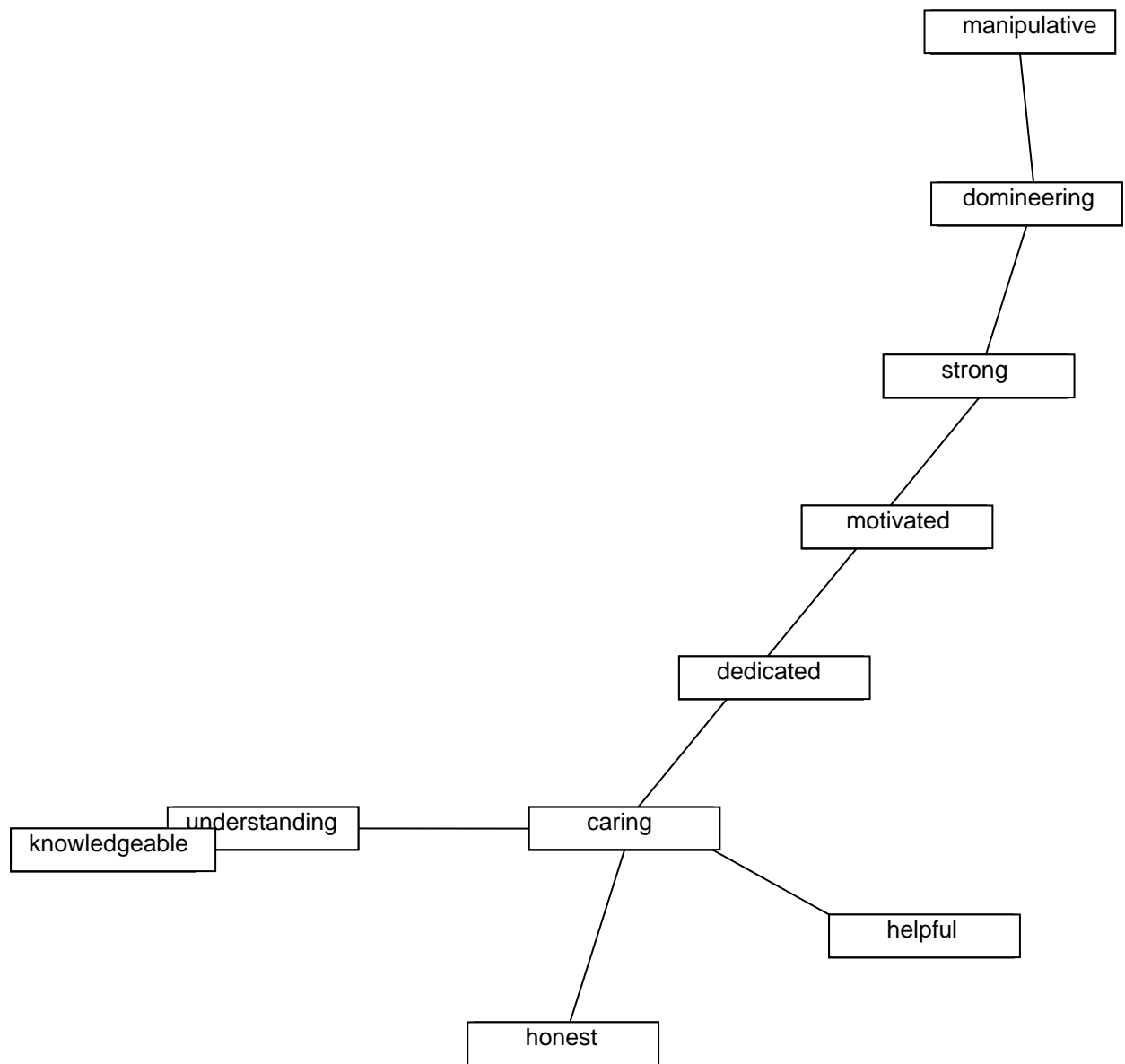
Figure 1. Average trait network for student leaders.
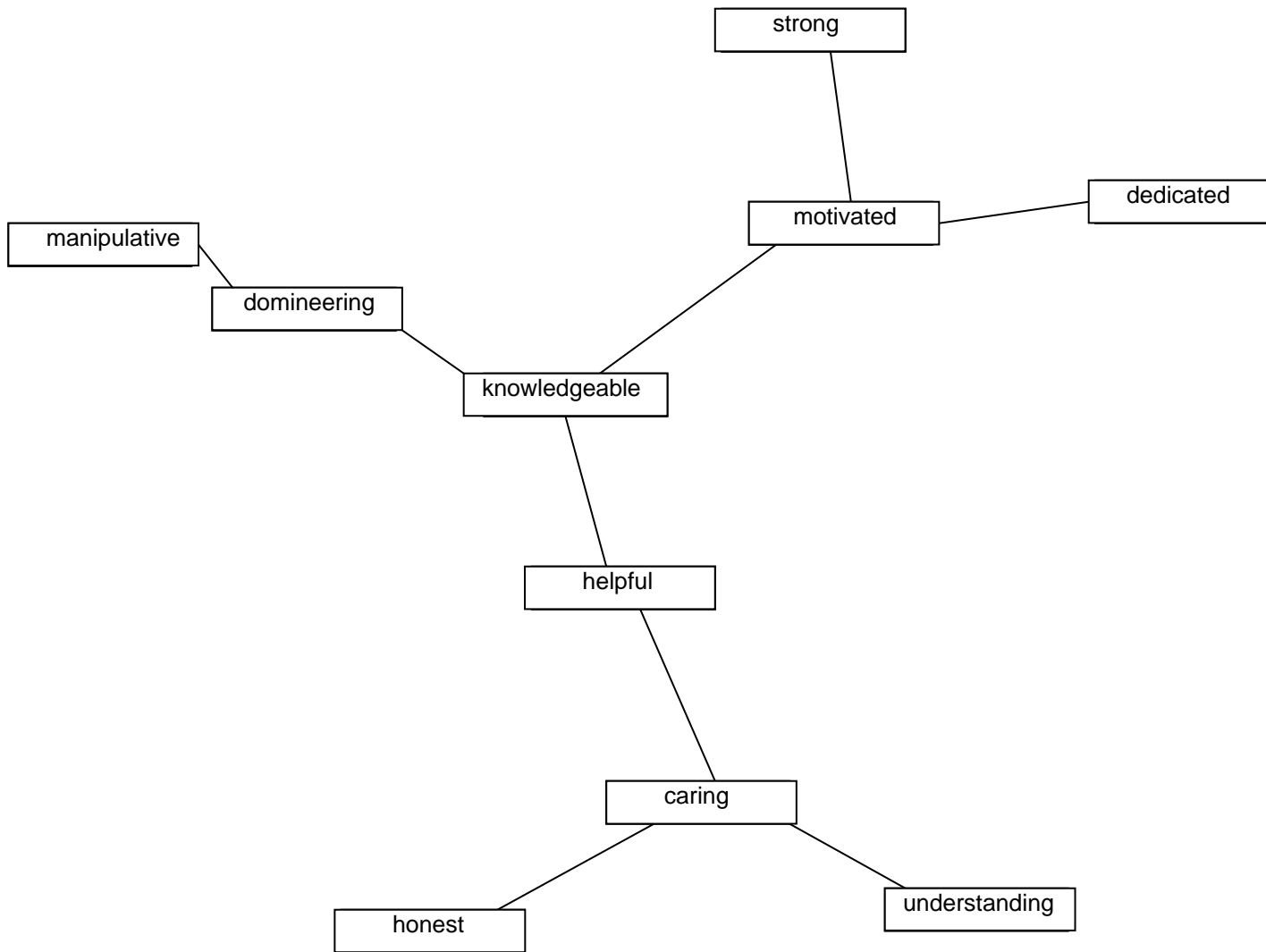
Figure 2. Average behavior network for student leaders.
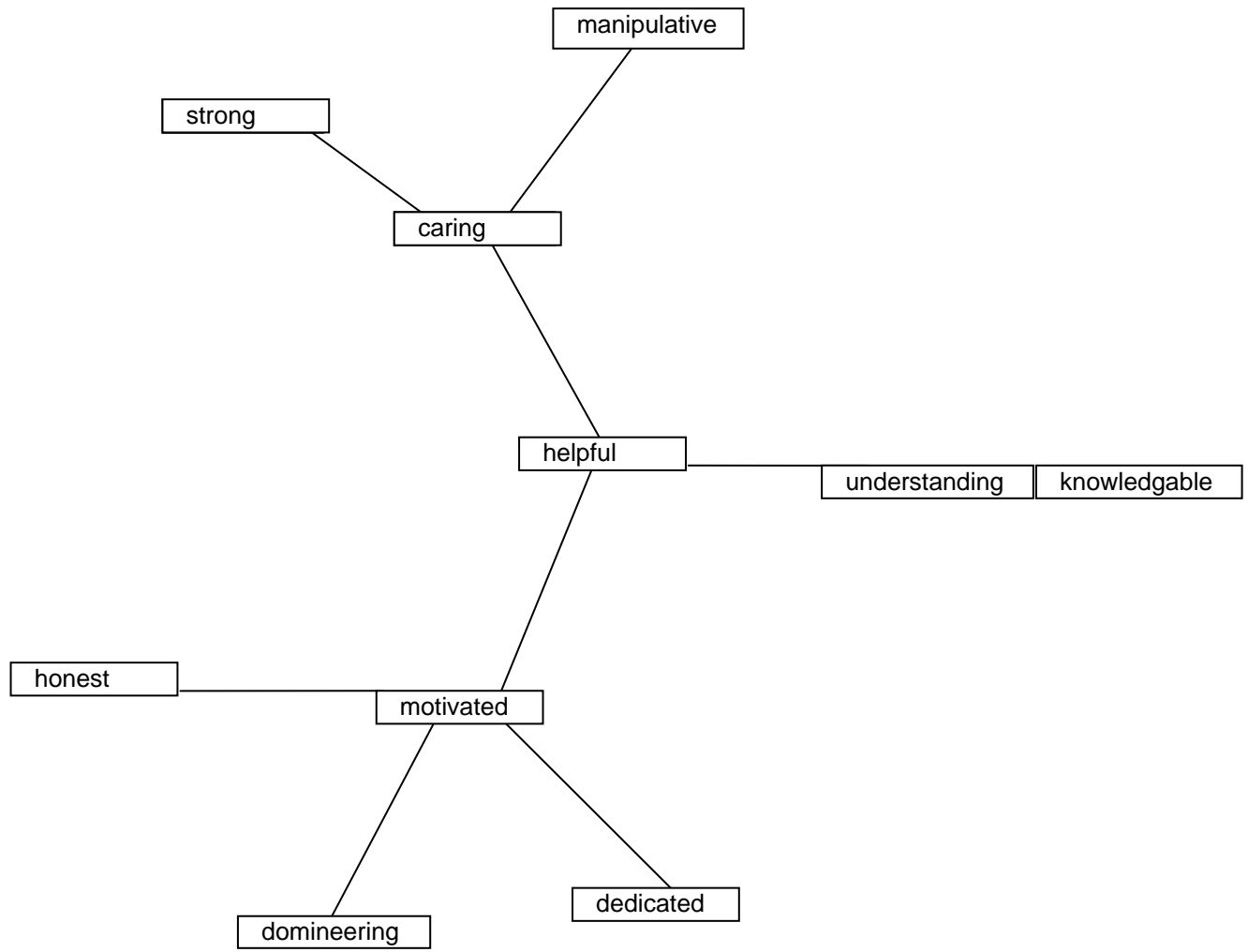
Figure 3. Derived trait network for the relevant leader.
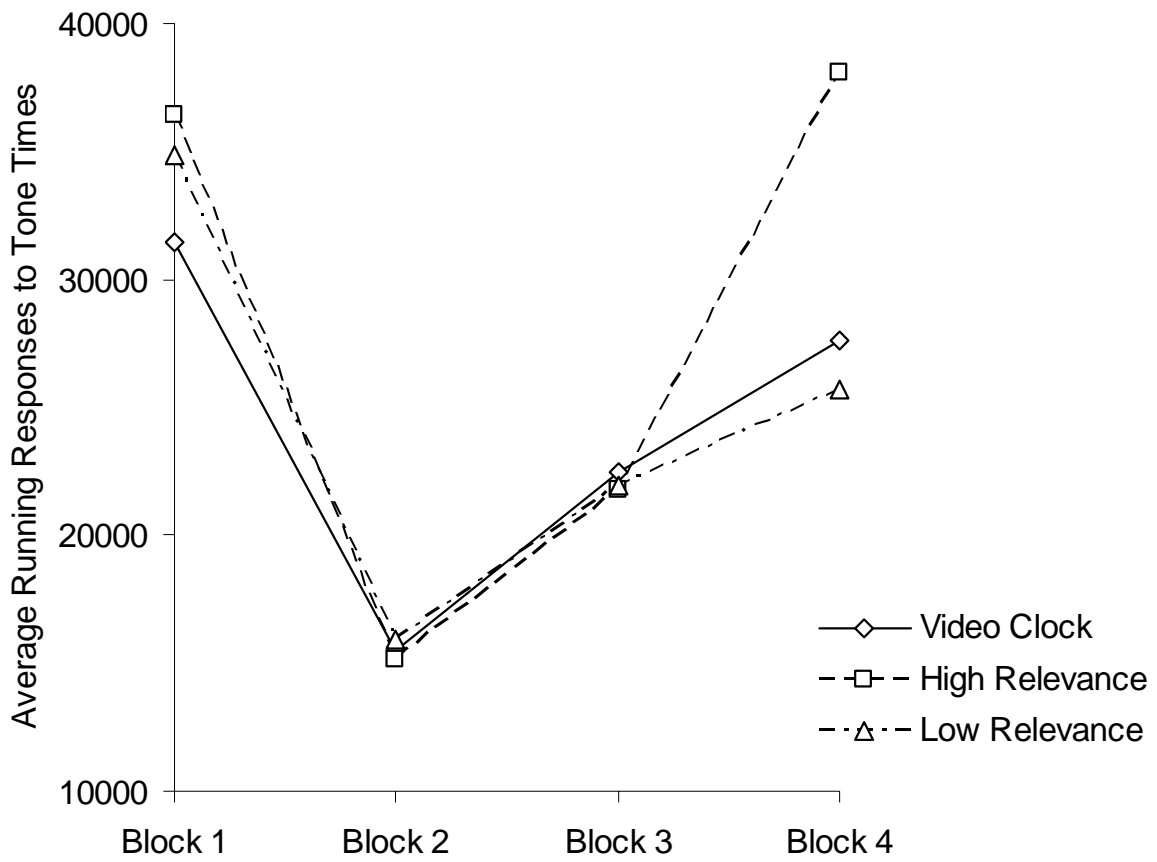
Figure 4. Within-subject repeated measure of response times across four blocks during VVBST.
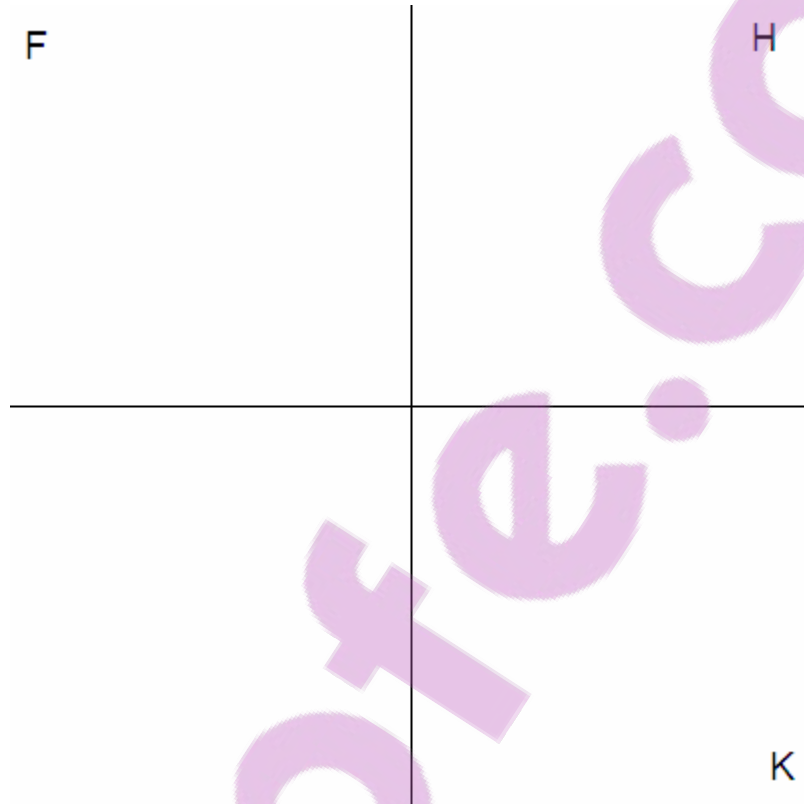
Figure 5. Representation of screen coordinates presented during VVBST.

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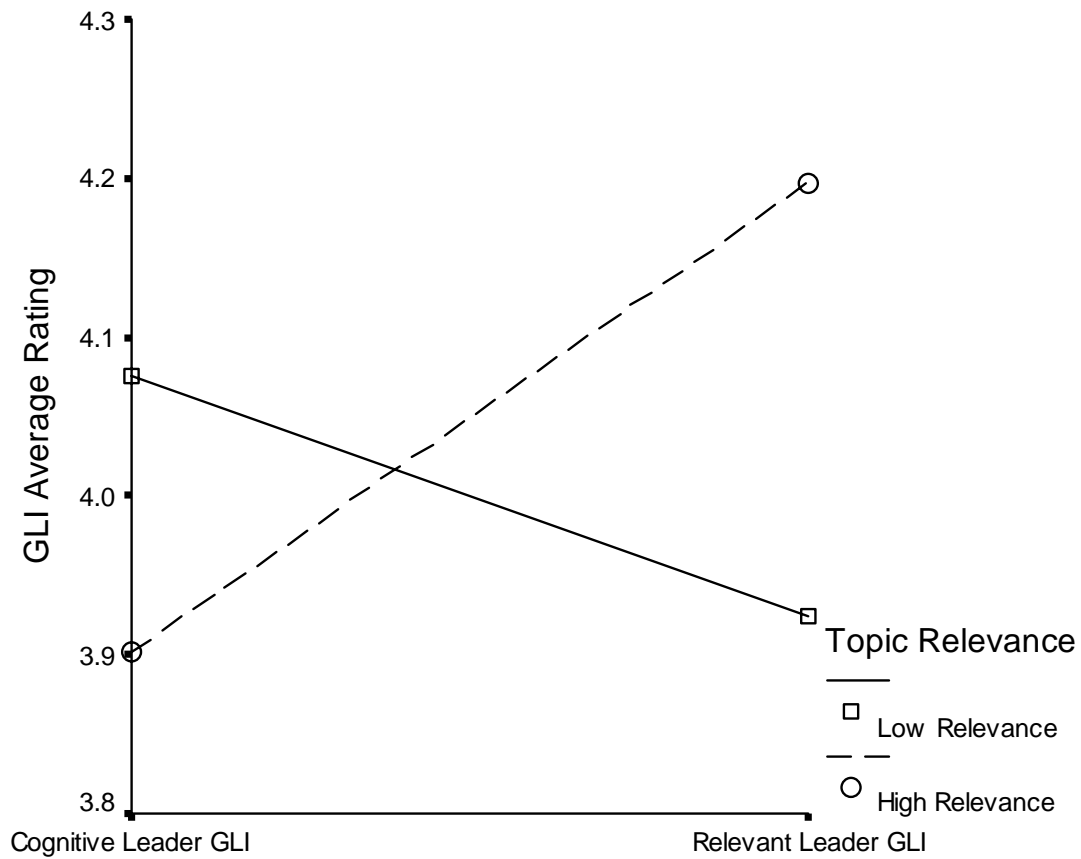
Figure 6. Within-subject repeated measure GLI ratings for the Cognitive and Relevant leader for Low Relevance and High Relevance participants.
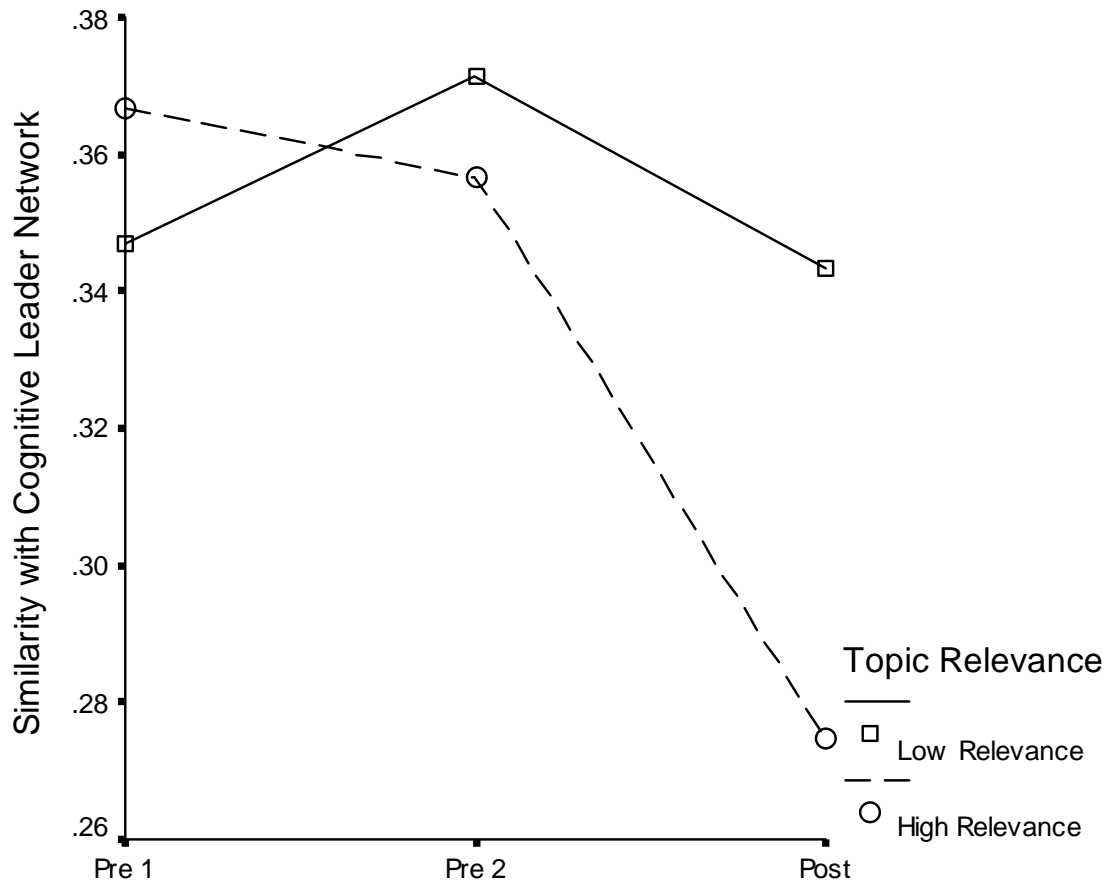
Figure 7. Similarity between cognitive leader network and the networks of low and high

relevance participants across the three measurement points.

Appendix A: Traits and Corresponding Behavioral Sentences

Caring
    Exhibits an openness to the ideas of other people
    Is responsive to the feelings of other group members *

Intelligent (Intelligence)
    Makes decisions that address the concerns of the group
    Thinks quickly

Understanding (Sensitivity)
    Encourages open communication when facing conflict *
    Listens to the ideas of other group members

Honest
    Speaks openly about ideas and beliefs
    Does not take credit for the ideas of others *

Helpful (Sensitivity)
    Supportive of other group members
    Offers to assist other group members

Dedicated (Dedication)
   *Hard-worker*
    Willing to sacrifice other interests *

Strong (Dynamism)
    Is assertive in advocating a perspective and does not easily give up on the idea
    Will stand-alone and not conform to the majority

Charismatic
    Will motivate others to be dedicated to the task *
    Is articulate when speaking with other group members

Domineering (Tyranny)
    Values power having power over other people^
    Is aggressive in the pursuit of what they believe needs to be done

Masculine (Masculinity)
    Does not openly express emotions or concern for others^
    Displays anger when challenged by someone

Energetic (Dynamism)
    Displays enthusiasm when speaking about goals and tasks
    Helps others to "get going" by offering encouragement and support

Motivated (Dedication)
>   *Wants to begin working on assignments right away*
>   *Has a clear purpose*

Knowledgeable (Intelligence)
>   *Is well-informed about the issues and the means necessary to attain a final goal*
>   *Has prior experience relative to the tasks being performed*

Manipulative (Tyranny)
>   Will make empty promises in order to gain compliance from others
>   Will place people in conflict in order to achieve what they want

Notes: Traits are derived from Epitropaki & Martin, 2004
>   Behavioral sentences in italics are derived from Kenney et. al., 1996
>   Behavioral sentences with asterisk are derived from Scott & Brown, 2004
>   Behavioral sentences with the "^" are derived from Burk et al., 2004

"An Online Survey of Semantics"

Below are seven statements. Each statement contains an underlined word which is meant to describe a person who demonstrates the behavior in the sentence. Please read the statement and then rate the statement on how well it describes the behavior of the person described by the underlined word.

Please use the following rating scale while completing this task:

Rating Scale

O	O	O	O	O	O	O
1	2	3	4	5	6	7
not at all representative			neutral			extremely representative

	1	2	3	4	5	6	7
A person who is <u>intelligent</u> can think quickly when questioned	O	O	O	O	O	O	O
A person who is <u>strong</u> works hard to complete a task.	O	O	O	O	O	O	O
A person who is <u>honest</u> will put people in conflict with one another in order to meet their needs.	O	O	O	O	O	O	O
A person who is <u>motivated</u> will display enthusiasm when speaking about their goals.	O	O	O	O	O	O	O
A person who is <u>knowledgeable</u> will make decisions that accurately address an issue.	O	O	O	O	O	O	O
A person who is <u>helpful</u> will actively support other people.	O	O	O	O	O	O	O
A person who is <u>domineering</u> will display anger when challenged by someone.	O	O	O	O	O	O	O

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Please use the following rating scale while completing this task:

Rating Scale

O	O	O	O	O	O	O
1	2	3	4	5	6	7
not at all representative			neutral			extremely representative

A person who is <u>masculine</u> will not openly express emotions or concern for others.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>manipulative</u> will make empty promises in order to gain assistance from others.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>dedicated</u> will stand alone and not conform to the majority.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>caring</u> exhibits an openness to the ideas of other people.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>energetic</u> wants to immediately begin working on assignments.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>charismatic</u> is responsive to the feelings of the other people around them.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>understanding</u> offers to assist other people around them.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

"An Online Survey of Semantics"

Below are seven statements. Each statement contains an underlined word which is meant to describe a person who demonstrates the behavior in the sentence. Please read the statement and then rate the statement on how well it describes the behavior of the person described by the underlined word.

Please use the following rating scale while completing this task:

Rating Scale

O	O	O	O	O	O	O
1	2	3	4	5	6	7
not at all representative			neutral			extremely representative

	1	2	3	4	5	6	7
A person who is knowledgeable demonstrates a high level of understanding and is successful when working in areas related to that understanding.	O	O	O	O	O	O	O
A person who is masculine will display anger when challenged by someone.	O	O	O	O	O	O	O
A person who is energetic will display enthusiasm when speaking about their goals.	O	O	O	O	O	O	O
A person who is caring is responsive to the feelings of the other people around them.	O	O	O	O	O	O	O
A person who is intelligent has prior experience that allows them to perform at a higher level than those with less experience.	O	O	O	O	O	O	O
A person who is honest will speak openly and honestly about their ideas and beliefs.	O	O	O	O	O	O	O
A person who is understanding will encourage honest and fair communication when conflict occurs.	O	O	O	O	O	O	O

"An Online Survey of Semantics"

Below are seven statements. Each statement contains an underlined word which is meant to describe a person who demonstrates the behavior in the sentence. Please read the statement and then rate the statement on how well it describes the behavior of the person described by the underlined word.

Please use the following rating scale while completing this task:

Rating Scale

O	O	O	O	O	O	O
1	2	3	4	5	6	7
not at all representative			neutral			extremely representative

A person who is <u>charismatic</u> exhibits an openness to the ideas of other people.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>dedicated</u> will not easily give up on a point of view that they advocate.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>strong</u> will sacrifice their personal interests to focus on the interests of other people.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>helpful</u> offers to assist other people around them.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>manipulative</u> will put people in conflict with one another in order to meet their needs.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>domineering</u> will not openly express emotions or concern for others.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>motivated</u> wants to immediately begin working on assignments.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

"An Online Survey of Semantics"

Below are seven statements. Each statement contains an underlined word which is meant to describe a person who demonstrates the behavior in the sentence. Please read the statement and then rate the statement on how well it describes the behavior of the person described by the underlined word.

Please use the following rating scale while completing this task:

Rating Scale

O   O   O   O   O   O   O

1   2   3   4   5   6   7

not at all   neutral   extremely
representative   representative

Statement	1	2	3	4	5	6	7
A person who is <u>knowledgeable</u> has prior experience that allows them to perform at a higher level than those with less experience.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>masculine</u> will aggressively pursue a goal or task when they believe it needs to be done.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>manipulative</u> will speak openly and honestly about their ideas and beliefs.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>helpful</u> will encourage honest and fair communication when conflict occurs.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>caring</u> is articulate when speaking with other people.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>domineering</u> values having power over other people.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>charismatic</u> can motivate other people to pursue the same goals.	O 1	O 2	O 3	O 4	O 5	O 6	O 7

"An Online Survey of Semantics"

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Please use the following rating scale while completing this task:

Rating Scale

O	O	O	O	O	O	O
1	2	3	4	5	6	7
not at all representative			neutral			extremely representative

	1	2	3	4	5	6	7
A person who is <u>intelligent</u> demonstrates a high level of understanding and is successful when working in areas related to that understanding.	O	O	O	O	O	O	O
A person who is <u>understanding</u> will actively listen to the ideas of other people.	O	O	O	O	O	O	O
A person who is <u>energetic</u> will help encourage others to start working toward a goal they have in common.	O	O	O	O	O	O	O
A person who is <u>motivated</u> has a clear goal that they want to achieve.	O	O	O	O	O	O	O
A person who is <u>dedicated</u> works hard to complete a task.	O	O	O	O	O	O	O
A person who is <u>honest</u> will not take credit for the ideas of other people.	O	O	O	O	O	O	O
A person who is <u>strong</u> will not easily give up on a point of view that they advocate.	O	O	O	O	O	O	O

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"An Online Survey of Semantics"

Below are seven statements. Each statement contains an underlined word which is meant to describe a person who demonstrates the behavior in the sentence. Please read the statement and then rate the statement on how well it describes the behavior of the person described by the underlined word.

Please use the following rating scale while completing this task:

Rating Scale

O	O	O	O	O	O	O
1	2	3	4	5	6	7
not at all representative			neutral			extremely representative

A person who is <u>caring</u> can motivate other people to pursue the same goals.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>masculine</u> values having power over other people.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>intelligent</u> will make decisions that accurately address an issue.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>motivated</u> will help encourage others to start working toward a goal they have in common.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>honest</u> will make empty promises in order to gain assistance from others.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>understanding</u> will actively support other people.	O 1	O 2	O 3	O 4	O 5	O 6	O 7
A person who is <u>dedicated</u> will sacrifice their personal interests to focus on the interests of other people.	O 1	O 2	O 3	O 4	O 5	O 6	O 7

"An Online Survey of Semantics"

Below are seven statements. Each statement contains an underlined word which is meant to describe a person who demonstrates the behavior in the sentence. Please read the statement and then rate the statement on how well it describes the behavior of the person described by the underlined word.

Please use the following rating scale while completing this task:

Rating Scale

O	O	O	O	O	O	O
1	2	3	4	5	6	7
not at all representative			neutral			extremely representative

A person who is <u>helpful</u> will actively listen to the ideas of other people.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>strong</u> will stand alone and not conform to the majority.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>manipulative</u> will not take credit for the ideas of other people.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>charismatic</u> is articulate when speaking with other people.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>knowledgeable</u> can think quickly when questioned.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>domineering</u> will aggressively pursue a goal or task when they believe it needs to be done.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

A person who is <u>energetic</u> has a clear goal that they want to achieve.

O	O	O	O	O	O	O
1	2	3	4	5	6	7

"An Online Survey of Semantics"

Please answer the following questions about the honor system. Thank you for your time.

How familiar are you with Virginia Tech's Honor System?

Please rate your answers with "1" indicating "Not at all familiar" and "7" indicating "Highly familiar."

```
O     O     O     O     O     O     O
1     2     3     4     5     6     7
```

Are you familiar with the single-sanction honor system, in which any honor system violation leads to expulsion from school? An example of this approach is the honor system in place at the University of Virginia.

Please rate your answers with "1" indicating "Not at all familiar" and "7" indicating "Highly familiar."

```
O     O     O     O     O     O     O
1     2     3     4     5     6     7
```

Would you support the implementation of a single-sanction system at Virginia Tech?

Please rate your answers with "1" indicating "Absolutely do not support" and "7" indicating "Absolutely support."

```
O     O     O     O     O     O     O
1     2     3     4     5     6     7
```

Appendix C: Final 10 Trait-Behavior Pairs

<u>Caring</u>: Responsive to the feelings of the other people around them

<u>Dedicated</u>: Works hard to complete a task

<u>Domineering</u>: Values having power over other people

<u>Helpful</u>: Offers to assist other people around them

<u>Honest</u>: Will not take credit for the ideas of other people

<u>Manipulative</u>: Will make empty promises in order to gain assistance from others

<u>Knowledgeable</u>: Has prior experience that allows them to perform at a higher level than those with less experience

<u>Motivated</u>: Has a clear goal that they want to achieve

<u>Strong</u>: Will stand alone and not conform to the majority

<u>Understanding</u>: Will actively listen to the ideas of other people

Appendix D: Word List

Study ID: _____ Date: _____

Please read through the following word list and circle the words that you believe you can define.

Hendecagon

Antiphrasis

Pedology

Ebrious

Chaparral

Usance

Sumptuary

Crinite

Atrichia

Solecism

Erudite

Sciolist

Holophrastic

Ensorcell

Dehisce

Exonym

Cryptonym

Brumal

Intenerate

Veld

Study ID:_____   Date _____

Word Search

There are no backwards or diagonals, all of the words are presented either left to right or top to bottom. When you find a word from the word list, please circle the word. After you find a word in the word search, please place a mark through the word on the list. *Find each of the following words:*

DEHISCE	ATRICHIA	SUMPTUARY	CRINITE
CRYPTONYM	PEDOLOGY	EXONYM	VELD
SOLECISM	USANCE	HENDECAGON	CHAPARRAL
EBRIOUS	BRUMAL	ERUDITE	INTENERATE
ANTIPHRASIS	HOLOPHRASTIC	ENSORCELL	SCIOLIST

```
S U M P T U A R Y O H E N D E C A G O N L O R
A P A H O A L S I S I R O I N D A T N Y N C A
D E O R L T E I V I P D O E T S N O S E H E C
E R H I Y R S A E H E A S X S C T H T E O B N
H E A E A I C N L T D E L O R I I C A N L R T
I Y S R O C H E D I O E L N A O P C H S O I O
S S Y U T H S I S C L H I Y Y L H R I O P O E
C E D D S I I E U L O E L M E I R I R R H U P
E D R I S A A B X O G E R S H S A N U C R S E
P S N T B R U M A L Y I R S E T S I S E A I R
C S M E I N T E N E R A T E R R I T A L S U U
E E E A D R C H A P A R R A L R S E N L T T A
E E I U E I T P E L D E E O H D S I C I I H P
U O V S O L E C I S M L G C T R N A E E C R C
R U O T N E R C R Y P T O N Y M N A Y L L T C
T A A O I C R D M L R C U P T C R E R N S I P
```

DEHISCE	CRYPTONYM	SOLECISM	EBRIOUS
ANTIPHRASIS	ATRICHIA	PEDOLOGY	USANCE
BRUMAL	HOLOPHRASTIC	SUMPTUARY	EXONYM
HENDECAGON	ERUDITE	ENSORCELL	CRINITE
VELD	CHAPARRAL	INTENERATE	SCIOLIST

```
S U M P T U A R Y    H E N D E C A G O N
              A                    A
    D         T    V   P    E   S N      H E
    E         R    E   E    X   C T    E O B
    H    E    I    L   D    O   I I    N L R
    I    R    C    D   O    N   O P C  S O I
    S    U    H        L    Y   L H R  O P O
    C    D    I        O    M   I R I  R H U
    E    I    A        G        S A N U C R S
         T B R U M A L Y        T S I S E A
         E I N T E N E R A T E    I T A L S
              C H A P A R R A L  S E N L T
                                  C   I
         S O L E C I S M          E   C
              C R Y P T O N Y M
```

Appendix F: Topic Relevance Measure Pilot 2/Focal Study

1.   Do you own an IPOD or other form of digital music player?

                    Yes   No

2.
     a.   (Pilot Study 2) Have you ever used a file-sharing program (i.e., Kazaa, Limewire, etc.)?

          Yes
          No

     b.   (Focal Study) Select the response that best describes how often you use a file-sharing program
          (i.e., Kazaa, Limewire, etc.).

          Never
          Once or twice a year
          Once or twice a month
          Once or twice a week
          Daily

3.
     a.   (Pilot Study 2) Have you ever downloaded music through a payment or subscription service?

          Never
          Once or twice a year
          Once or twice a month
          Once or twice a week
          Daily

     b.   (Focal Study) Select the response that best describes how often you download music through a
          payment or subscription service.

          Never
          Once or twice a year
          Once or twice a month
          Once or twice a week
          Daily

4.   Do you agree with the following statement: "I believe that downloading music without paying for the
     music is not stealing."

            1   2   3   4   5   6   7
        completely   neither agree   completely
         disagree   or disagree   agree

5.   Do you agree with the following statement: "I believe that downloading music without paying for the
     music, is stealing."

            1   2   3   4   5   6   7
        completely   neither agree   completely
         disagree   or disagree   agree

6. Do you agree with the following statement: "I believe the University should treat the downloading of music without payment as theft."

1	2	3	4	5	6	7
completely disagree			neither agree or disagree			completely agree

7. Do you agree with the following statement: "If the University provided a free and legal music service, I would use the service and not other file-sharing programs."

1	2	3	4	5	6	7
completely disagree			neither agree or disagree			completely agree

Note: Items 2 and 3 contain two versions of each item. Version "a" was used during pilot testing, version "b" was modified for the focal study.

Appendix G: Instructions for Word Search Cognitive Distracter Task

"To complete the cognitive task, you have five minutes to complete a word search. The word search is based on the word list you examined earlier and is provided to you on form two. When prompted, turn over form two and begin the word search. To complete the word search, use the word list at the top of the form. When you find a word in the body of the word search, circle the word in the body of the word search and then cross the word off of the word list. You will have five minutes to complete the task, you will see a ten-second countdown before time expires. Please use the pencil provided and when the time is up, or you are done, please turn the word search over. Upon completion of the word search, you will start the second rating task. Instructions for the rating task will be presented to you on the computer monitor. When you are ready to begin the word search, press the space bar, and the timer will begin."

Appendix H: File Sharing Arguments Survey

<u>File Sharing Arguments Survey</u>

Instructions: Starting with Argument 1, read the argument and then respond to the four statements below the argument. When you have completed reading and responding to the first argument, continue through all six of the arguments. Please do not go back and change your answers, and do not read the arguments out of order.

ARGUMENT 1

Point 1: The University doesn't really have an explicit position about the use of peer-to-peer networks to swap files, but I believe that the policy about proper and ethical computer use makes the University's position on the issue apparent.

Counterpoint 1: I do not believe that the University's position on file sharing is that clear, though I do believe that the University has a primary responsibility to protect the rights of the students at the University.

1. I believe that one of the arguments is stronger based on my personal beliefs.

| Completely disagree | Slightly disagree | Neither or disagree or agree | Slightly agree | Completely Agree |

2. Please compare the strength of the arguments relative to each other.

| P is much stronger | P is slightly stronger | About equal | CP is slightly stronger | CP is much stronger |

ARGUMENT 2

Point 2: I think it is going a little far to label file-sharing as stealing, and if the University is going to take that stance, then they would need to police the students. This seems to contradict the idea of protecting a student's right to privacy, which the University presents alongside the policy regarding the protection of intellectual rights.

Counterpoint 2: I don't believe that labeling file-sharing as stealing is a contradiction with University's policy.   The offenses that are addressed in the policy clearly include illegal file-sharing, as adults, we have a responsibility to know what that means for us as students, I don't think it is necessary for the University to say, "Don't steal."

1. I believe that one of the arguments is stronger based on my personal beliefs.

| Completely disagree | Slightly disagree | Neither or disagree or agree | Slightly agree | Completely Agree |

2. Please compare the strength of the arguments relative to each other.

| P is much stronger | P is slightly stronger | About equal | CP is slightly stronger | CP is much stronger |

ARGUMENT 3

Point 3: While the data may suggest that the sales related to lesser known, or small-label artists may benefit from the use of file-sharing, what we forget is that those lesser known musicians are all working toward the larger goal of success. File sharing hurts that larger goal. When 10

percent of a multi-billion dollar industry is lost, that represents a significant amount loss. Now, I realize that successful artists still get a lot of money, but there are so many other people associated with the music business that depend on the money generated by sales. I think that the bottom line is that file-sharing is stealing, it is taking money out of someone's pocket.

Counterpoint 3: In looking at the data, I believe that the recording industry has misrepresented the extent to which file sharing has impacted their multi-billion dollar business. I have seen research that argues that file sharing actually helps with the development and expansion of the careers and sales of musicians. It is as if file sharing provides a community based method for promotion and development of careers. I do not believe that it is stealing, I believe that is simply a case of societal change that the recording industry is uncomfortable with because they are losing their ability to control the careers of artists.

1. I believe that one of the arguments is stronger based on my personal beliefs.

Completely disagree   Slightly disagree   Neither or disagree or agree   Slightly agree   Completely Agree

2. Please compare the strength of the arguments relative to each other.

P is much stronger P is slightly stronger   About equal   CP is slightly stronger   CP is much stronger

ARGUMENT 4

Point 4: I do not believe that the University should target the use of file sharing software. I believe it would be a mistake for the University to target software that the courts have said is not illegal, and I believe it would be short sighted for the University to not see that file sharing software supports more than music swapping.

Counterpoint 4: Looking at what the courts are suggesting about liability, and the number of lawsuits popping up around the world, I believe that it would be in the best interest of the University and of the students, to recommend that measures are put in place to prevent the use of file-sharing software on University networks.

1. I believe that one of the arguments is stronger based on my personal beliefs.

Completely disagree   Slightly disagree   Neither or disagree or agree   Slightly agree   Completely Agree

2. Please compare the strength of the arguments relative to each other.

P is much stronger P is slightly stronger   About equal   CP is slightly stronger   CP is much stronger

ARGUMENT 5

Point 5: While the courts have protected the legality of the software, they have made it clear that if the intent of the software is to steal copyrighted material, then companies associated with that process can be responsible for the illegal activity. I think it would be unfortunate if the University was targeted by the recording industry because of the activities of students. The students make up the University, and I can only imagine that the costs of a lawsuit would be passed on to us.

Counterpoint 5: I think that it is unclear how the University would fare in a lawsuit situation. I believe that the University could ethically and legally argue that they are protecting the rights of the individual to have free access to the internet. I think that the recording industry can only continue to go after the software manufacturers, and for every company the folds, I believe more will emerge. The file-sharing technology actually serves to support the spread of further software, so I do not believe it can be stopped by lawsuits.

1. I believe that one of the arguments is stronger based on my personal beliefs.

Completely disagree   Slightly disagree   Neither or disagree or agree   Slightly agree   Completely Agree

2. Please compare the strength of the arguments relative to each other.

P is much stronger P is slightly stronger   About equal   CP is slightly stronger   CP is much stronger

ARGUMENT 6

Point 6: I think that the University could take a more pro-active stance and provide access to some sort of a program that allows students access to music, but does not require students to subscribe. I know that other Universities are offering access to music services to all on-campus students, and that the cost is absorbed through student activity fees. By providing that option, I think that the University would see a natural decline in file sharing, and then it would become a non-issue.

Counterpoint 6: I think that the proper response is to treat the use of specific file sharing programs as inappropriate. If students are found to be using the software, then the University can investigate, and if they find that a student is downloading music illegally, the University should refer them to the honor system. I am not suggesting that the University watches our every move, but I do think that we should all be protected from any further legal actions that may come up as a result of illegal downloading.

1. I believe that one of the arguments is stronger based on my personal beliefs.

Completely disagree   Slightly disagree   Neither or disagree or agree   Slightly agree   Completely Agree

2. Please compare the strength of the arguments relative to each other.

P is much stronger P is slightly stronger   About equal   CP is slightly stronger   CP is much stronger

Appendix I: Focal Study VVBST Script

A Discussion on File Sharing – Evaluating Leadership Representation and Selection

Chris (Cognitive): Alright guys, why don't we get started here. Since we were asked to talk about this, I thought that we could take a few moments to express our perspectives about why we are here and then start to work through the issues we need to address. Is everyone O.K. with that?

(Tone 1)

Matt (Neutral): Sounds good.

Tom (Relevant): That works for me.

Chris (Cognitive): Great, I just wanted to start by saying that we were all selected to this committee as student leaders in order to discuss all sides of this issue, and to represent those sides fairly and honestly. My role as a leader is one that I take very seriously, and I value the opportunity to lead my peers as their representative. To begin with, while my perspective may not appeal to everyone, I don't want this to be an issue of simply conform to the majority (STRONG), because I believe that everyone will benefit in the long-run from a well-thought out decision. That being said, I believe that my perspective is solid and represents a clear argument, and I intend on convincing you of the merits of my perspective (MOTIVATED). I also realize that while it may not be easy to make a recommendation we are all comfortable with, I will work hard to make a recommendation we can all live with (DEDICATED).

(Tone 2)

-------------------------------------- *FADE PICTURE* --

Matt (Neutral): While, I may not have as strong a position as Chris (Cognitive), I do intend to explore all sides of the issue. In particular, I want to make sure that we spend enough time evaluating the issue from the point of view of all students, as well as the University administration.

Tom (Relevant): I, much like Chris (Cognitive), have a pretty strong opinion about the issue, and while I believe that my perspective reflects the opinion of the majority, I do not believe it is one that I would easily compromise on (STRONG). That being said, I do not want this discussion to get so heated that anyone is offended or upset in any way (CARING). If no one minds, I would like to take notes during the meeting, I find that it is helpful to keep our conversation on track (HELPFUL).

(Tone 3)

Matt (Neutral): Thanks.

Chris (Cognitive): Thank you.

--------------------------------------- *FADE PICTURE* --

Tom (Relevant): It is important to me that we reach our decision and make our suggestions based on information and not emotion, that way our recommendations will be taken seriously. I feel like we have the opportunity to make a really important decision that may impact the students of the University, and I want to make sure that my participation in this does not reflect poorly on me as a leader.

(Tone 4)

Chris (Cognitive): Yeah, I appreciate you making everyone aware of how we shouldn't be talking about our feelings, though they are important (CARING), but instead we should be focusing on the facts. I would be happy to put together a formal report and references after we have come to a conclusion (HELPFUL). I have also tried to use information based on numbers and not just emotional responses to the issue (HONEST).

(Tone 5)

Tom (Relevant): I spent a fair amount of time reading news articles and other writings before we met (DEDICATED). I've tried to incorporate the ideas and opinions of my peers and the various articles that I have come across (MOTIVATED). So, I don't want to take credit for any numbers that I throw out, though I don't have any references with me right now (HONEST).

(Tone 6)

Matt (Neutral): OK, well, when it comes to the issue of file sharing and peer-to-peer networks, there appears to be tension in the position held by the University, between the protection of intellectual property rights and the student's right to privacy.

(Tone 7)

--------------------------------------- *FADE PICTURE* --

Chris (Cognitive): Right, the University doesn't really have an explicit position about the use of peer-to-peer networks to swap files, but I believe that the policy about proper and ethical computer use makes the University's position on the issue clear.

(Tone 8)

Tom (Relevant): Well, I don't believe that the position is that clear, though I do believe that the University has a primary responsibility to protect the rights of the students at the University.

(Tone 9)

Matt (Neutral): But, the University doesn't explicitly say "If you download music without paying for it, you are going to be sent to the honor council, or referred to the police," so what are students supposed to expect.

(Tone 10)

Chris (Cognitive): Sure, but the offenses the University talk about in the policy clearly include illegal file-sharing, as adults, we have a responsibility to know what that means for us as students, I don't think it is necessary for the University to say don't steal.

(Tone 11)

Tom (Relevant): First of all, I think it is going a little far to label file-sharing as stealing, and if the University is going to take that stance, then they would need to police the students, which seems to contradict the idea of protecting a student's right to privacy, which is also included in the same policy regarding protecting intellectual rights.

(Tone 12)

--------------------------------------- *FADE PICTURE* --

Matt (Neutral): OK, outside of the University policy, what is the issue with file-sharing? Should we label it as an illegal activity, like stealing, or is it more reasonable to treat the topic as one that is misunderstood?

(Tone 13)

Tom (Relevant): In looking at the data, I believe that what has happened is that the recording industry has misrepresented the extent to which file-sharing has impacted their multi-billion dollar business. I have seen research that argues that file-sharing actually helps with the development and expansion of the careers and sales of musicians. It is as if file-sharing provides a community based method for promotion and development of careers. I don't believe that it is stealing, I believe that is simply a case of change in society, and that the recording industry is uncomfortable with what that means for their ability to control the careers of artists.

(Tone 14)

Chris (Cognitive): While the data may suggest that the sales related to lesser known, or small-label artists may benefit from the use of file-sharing, what we forget is that those lesser known musicians are all working toward some larger goal of success. File-sharing hurts that larger goal. When 10 percent of a multi-billion dollar industry is lost, that represents a significant amount of money lost. Now, I realize that the successful artists still get a lot of money, but there are so many other people associated with the music business that depend on the money generated by sales. I think that the bottom (Relevant) line is that file-sharing is stealing, it is taking money out of someone's pocket.

(Tone 15)

------------------------------------- *FADE PICTURE* ---

Matt (Neutral): What we should tell the University?

(Tone 16)

Chris (Cognitive): Looking at what the courts are suggesting about liability, and the number of lawsuits popping up around the world, I believe that it would be in the best interest of the University and of the students, to recommend that measures are put in place to prevent the use of file-sharing software on University networks.

(Tone 17)

Tom (Relevant): I don't believe that we should target the use of file-sharing software. I believe it would be a mistake for the University to target software that the courts have said are not illegal, and I believe it would be short-sighted for the University to not see that file-sharing software supports more than music swapping.

(Tone 18)

------------------------------------- *FADE PICTURE* ---

Chris (Cognitive): While the courts have protected the legality of the software, they have made it clear that if the intent of the software is to steal copyrighted material, then the companies associated with that process can be responsible for the illegal activity. I think it would be unfortunate if the University was targeted by the recording industry. The students make up the University, and I can only imagine that the costs would be passed on to us.

(Tone 19)

Tom (Relevant): I think that it is unclear how the University would fare in a lawsuit situation. I believe that the University could ethically and legally argue that they are protecting the rights of the individual to have free access to the internet. I think that the recording industry can only continue to go after the software manufacturers, and for every company the folds, I believe more will emerge. The file-sharing technology actually serves to support the spread of further software.

(Tone 20)

------------------------------------- *FADE PICTURE* ---

Chris (Cognitive): I think that the response is to treat the use of specific file-sharing programs as inappropriate. If students are found to be using the software, then the University can

investigate and if they find that a student is downloading music illegally, the University should refer them to the honor system. I am not suggesting that the University watches our every move, but I do think that we should all be protected from any further legal actions that may come up.

(Tone 21)

Tom (Relevant): Well, I am not in agreement with Chris (Cognitive), I think that the University could take a more pro-active stance and provide access to some sort of a program that allows us access to music, but doesn't cost us a lot of money. I know that other Universities are offering access to music services to all of the on-campus students, and that the cost is absorbed through student activity fees. By providing that option, I think that the University would see a natural decline in file-sharing, and then it would become a non-issue.

(Tone 22)

Chris (Cognitive): I wasn't really aware that…(END)

--------------------------------------- *FADE PICTURE* ---

Appendix J: GLI

General Leadership Impression (GLI)

The following questions concern your feelings towards and evaluations of group member
_____. Please check the answer that reflects your feelings.

1. How much did this member contribute to the effectiveness of the task?

Extreme	Substantial	Moderate	Very	Nothing
Amount	Amount	Amount	Little	

2. What degree of influence did this member exert in determining the final outcome of the task?

Extreme	Substantial	Moderate	Very	Nothing
Amount	Amount	Amount	Little	

3. How much leadership did this member exhibit?

Extreme	Substantial	Moderate	Very	Nothing
Amount	Amount	Amount	Little	

4. How much control over the group's activities did this member exhibit?

Extreme	Substantial	Moderate	Very	Nothing
Amount	Amount	Amount	Little	

5. If you had to choose a leader for a new task, how willing would you be to vote for this member as the leader?

Extreme	Substantial	Moderate	Very	Nothing
Amount	Amount	Amount	Little	

6. How much did this member encourage the contributions of other group members?

Extreme	Substantial	Moderate	Very	Nothing
Amount	Amount	Amount	Little	

7. How much did this member contribute to the discussion in a meaningful way?

Extreme	Substantial	Moderate	Very	Nothing
Amount	Amount	Amount	Little	

Appendix K: Focal Study Part 1 Instructions

Have <u>all</u> participants sit at their assigned computers, and then provide <u>all</u> of the participants with the following instructions.

- "The experiment is a two part study, which requires you to successfully complete today's task. If you successfully complete today's task, you will be asked to come back to the lab in 48 hours."

- "Today's task requires you to complete a series of ratings on the computer. In order to complete the task, you will be asked to rate the relatedness of pairs of concepts. Please rate the pairs in terms of how related the concepts are when you think about what a student leader is at Virginia Tech."

- "The task is sensitive to your level of engagement, so for the next ten minutes, please pay attention to the task at hand. Do not over-think the ratings, try to provide an honest response, there are no right answers."

- "When you are done with the task, please let me know, and I will let you know if you should return for the second part of the study."

- "If you understand the instructions, please begin the task. If you have questions, please let me know and I can clarify the task before you begin."

Appendix L: Focal Study PC-Knot Instructions

PC-Knot Concept Pair Rating Task Instructions

"Your task in this experiment will involve judging the relatedness of pairs of concepts. In making these types of judgements, there are several ways to think about the items being judged. For instance, two concepts might be related because they share common features or because they frequently occur together. While this kind of detailed analysis is possible, our concern is to obtain your initial impression of "overall relatedness."   Therefore, please base your ratings on your first impression of relatedness."

"Each pair of concepts will be presented on the screen along with a "relatedness" scale. You are to indicate your judgement of relatedness for each pair by pressing a key on the keyboard. If you feel that the concepts are not related at all press "1" on the keyboard. If you feel the concepts are highly related you would press an "8" or a "9". You can think of these numbers as points along a "relatedness" scale, with higher numbers representing greater relatedness. Upon responding, a bar marker will move directly above the number you pressed. If you wish to change your response, simply press another number. When you are satisfied with the rating you have given, press the SPACE BAR to enter your response. Following this, the next pair of items to be rated will be displayed.   Several pairs of concepts will be shown.   Now the complete list of concepts will be presented. This is done to give you a general idea of the scope of the concepts you will be rating."

Appendix M: Focal Study Part 2 Instructions

<u>Focal Study Part Two Instructions</u>

Have <u>all</u> participants sit at their assigned computers, and then provide <u>all</u> of the participants with the following instructions.

- "Thank you for returning for the second part of the study. In order to finish today's study, you will complete three tasks."

- "The first task is identical to the task that you completed during your first visit. You will rate the relatedness of pairs of concepts on how related they are when you think of what it means to be a student leader at Virginia Tech."

- "The rating tasks are sensitive to your level of engagement in the task, so please be attentive during the task and do not over-think your responses."

- "When you have completed the rating task, move your chair over to the computer next to you and begin by completing the survey."

- "After providing your responses, the computer monitor will present a black screen. When you see the black screen, please wait until the video starts to continue with the video section of the study."

- "During the video part, you will be asked to make a series of responses to the tones you hear. While you are watching the video, please sit at the computer with you hands on the keyboard and your fingers on the three response locations."

- "When making the responses, it is important that you make the response as quickly as possible after hearing the tone. As the task is sensitive to the length of time it takes to make a response, please keep your hands at the keyboard and do not over think your selection. Provide your response as quickly as possible. Please know that there are no right responses. "F", "H" and "K" are the response locations you will use during the video."

- "At the end of the video, you will complete a brief survey."

- "When you have completed the video task, you will move back to the computer you are seated at now. When you return to the computer, you will complete the third and final task, which is identical to the first task today. Again, please provide attentive and immediate responses to all of today's tasks. If there are no questions, please begin the task. If you have any questions, please let me know."

Appendix N: VVBST Instructions

<u>Pre-Video Instructions presented at the beginning of the VVBST</u>

The video you are about to watch is of a discussion between three student leaders on the topic of file sharing at the University. The University had several student leaders come together to make a recommendation that would guide further University policy. While we were unable to capture the actual discussions, we were able to have some of the student leaders come back in and provide a recreation of their discussions. During the course of the discussion, you will hear several tones.

<A sample tone was presented to participants.>

When you hear the tone, please select the individual that you would choose as the leader.
<The on-screen response grid was presented with the letters of "F", "H", and "K", presented in white, at in their respective on-screen locations, as well as the number "22" presented in red at the center of the screen.>

The number of leader selection responses you will make, during the presentation of the video, is currently being displayed.
<At this point, the "22" was removed from the screen, leaving only the letters in their respective response locations.>

While watching the video, if you would choose the individual in the upper left hand corner as the leader, please press the "F" key when you hear the tone. If you would choose the individual in the upper right hand corner, please press the "H" key when you hear the tone. If you would choose the individual in the lower right hand corner, please press the "K" key when you hear the tone.

<During the instructions that follow, the letter were turned from white to red in the following

order: "F" followed by a tone; "H" followed by a tone; "K" followed by a tone.>

In order to familiarize you with the response keys, you will need to provide responses to the next three tones that you hear. When you hear the tone please press the key that corresponds to the letter that has turned from white to red. You will make a response for each letter. The response process will begin know. We will now start the video, please remember to select the individual that you choose as the leader when you hear the tone.

Appendix O: Debrief

VIRGINIA POLYTECHNIC INSTITUTE & STATE UNIVERSITY

POST EXPERIMENT DEBRIEFING INFORMATION

STUDY TITLE: Understanding how students perceive their leaders

PRINCIPAL INVESTIGATORS: Dr. Roseanne Foti and Robert Knee.

Thank you for taking the time to participate in the study, "Understanding how students perceive their leaders." The purpose of this study is to more actively understand how we form impressions of leaders during our daily observations of student leaders. Previous research suggests that when people are in social situations they make judgments about other people based on previously formed expectations. Our expectations for how we believe people should behave influence our judgment of others, often without our direct awareness of having used our expectations.

Within the realm of leadership theory, our expectations for how leaders should behave, and what characteristics they should possess, is explained in part by Implicit Leadership Theory (ILT). ILT suggests that we have expectations that can be defined at a very broad level, for example, what behaviors simply define a leader vs. a non-leader. ILT also suggests that there are more finely developed expectations that define specific types of leaders, such as a student leader.

One purpose of the study was to collect information on your ILT for a student leader. The second purpose was to understand how stable your ILT for a student leader is, and if there are situations when you will choose to make judgments that are against your ILT. To accomplish the second purpose of the study, you watched a video with a panel of individuals discussing file-sharing at Virginia Tech and were asked to select a leader from the individuals in the video.

In order to provide you with the opportunity to evaluate a student leader, the video you watched was scripted by the experimenter and performed by actors. None of the comments, decisions, or behaviors exhibited in the video represent the personal views of the actors or experimenter, and none of the views expressed in the video, or by you as a participant, will be shared with the administration of Virginia Tech.

Thank you again for your participation, please take a moment to share any questions or concerns you may have with the experimenter. If you feel as if your questions or concerns have not been adequately addressed by the experimenter, please contact the individuals listed below. We have provided a reference list below if you are interested in learning more about the Implicit Leadership Theory that supported this research.

Readings on ILT:

Lord, R. G., Foti, R. J., & DeVader, C. L. (1984). A test of leadership categorization theory:
    Internal structure, information processing, and leadership perceptions. *Organizational
    Behavior and Human Performance, 34*, 343-378.

Offerman, L. R., Kennedy, J. K., & Wirtz, P. W. (1994). Implicit leadership theories: Content,
    structure, and generalizability. *Leadership Quarterly, 5(1)*, 43-58.

If you have any questions about this study, please feel free to contact any of the following individuals:

Dr. Roseanne Foti: (540) 231-5814 or rfoti@vt.edu
Robert Knee: (540) 231-2281 or reknee@vt.edu
Dr. David Harrison, Chair HSC: (540) 231-4422
Dr. David Moore, Chair IRB: (540) 231-4991 or moored@vt.edu

Curriculum Vitae
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Education
10/2006   M.S.   Industrial/Organizational Psychology, Virginia Polytechnic Institute and State University
05/2003   B.A.   Psychology, Distinguished Major, University of Virginia

Professional Experience
05/2005 - 08/2005   Assessment Personnel, NSF Grant for Departmental Level Reform, Department of Engineering Education, Virginia Polytechnic Institute and State University
05/2003 - 08/2003   Residential Coordinator, Little Keswick School, Keswick, VA
07/2000 - 04/2003   Asst. Residential Coordinator, Little Keswick School, Keswick, VA
09/1999 - 04/2003   Crisis Intervention Counselor, Little Keswick School, Keswick, VA

Teaching Experience
01/2005 - 05/2005   Graduate Level Research Methods Course, Teaching Assistant, Virginia Polytechnic Institute and State University
09/2003 - 05/2004   Introductory Psychology, Recitation Instructor, Virginia Polytechnic Institute and State University

Research Experience
09/2005 - Present   NSF IGERT Trainee, Exploring Interfaces through Graduate Education and Research (EIGER), Virginia Polytechnic Institute and State University
09/2001 - 05/2002   Undergraduate Research Assistant, Willingham Cognition Lab, Department of Psychology, University of Virginia

Scholarly Activities
09/2006   Poster Session Judge and Discussion Panelist, UMET-MIE XVII Undergraduate Research Symposium, San Juan, Puerto Rico

Publications
Knee, R., Thomason, S., Ashe, J., & Willingham, D. T. (in press). The representation of explicit motor sequence knowledge. *Memory & Cognition.*

Conference and Symposium Presentations
Knee, R. E., Kutcher, E. J., & Ullom, Z. J. (August, 2006). The effect of structure and interpersonal warmth on applicant reactions to selection interviews. Paper, Presented at Academy of Management Annual Meeting, Atlanta, GA.

Knee, R. E. (May 2003).   Explicit strategy skill representation in motor sequence learning, Paper, Presented at Undergraduate Research Symposium, University of Virginia

Grant Awards
04/2005   Graduate Research Development Project Grant Awarded

Professional and Honorary Organizations
Academy of Management – Student Affiliate
Society for Industrial and Organizational Psychology – Student Member
Psi Chi, National Honor Society in Psychology