The Role of Attention in Goal Setting Theory

by

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(Abstract)

This study examined the role of attention in goal setting theory, using techniques adapted from selective attention research. Specifically, it explored activation and suppression of goal related information in the presence of two conflicting assigned goals. Pre vs. post goal completion and goal commitment were examined as moderators of these attentional effects. In addition, exploratory analyses looked at the impact of individual differences on attention (goal preference & action-state orientation). Analyses were conducted using three-level hierarchical linear modeling (HLM), where repeated measures occur within trials, which are nested within individuals. In general, results failed to support the hypotheses. However, weak support was found for attentional effects when commitment was also taken into consideration. Further, while commitment was not found to have the strong moderating influence on attention that was hypothesized, there is some evidence for its overall importance to the attentional mechanism of the goal/performance relationship.

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The Role of Attention in Goal Setting

Previous research has determined that goal-related measures of micro-level information processing (activation and inhibition; relative accessibility of information from long term memory) provide a method for studying the role of attention in goal-attainment (Diefendorff, Snyder & Lord, 1997). In situations where multiple distractions are present, there is a need to focus on one goal and suppress competing or distracting goals in order to complete a task. Evidence that goals not only make information more accessible (Goschke & Kuhl, 1993; Marsh, Hicks & Bink, 1998; Marsh, Hicks & Bryan, 1999), but also serve to suppress distractions, has been presented in only a few studies (Diefendorff, Lord, Quickle, Sanders, & Hepburn, 1995; Diefendorff et al., 1997). The primary purpose of this investigation is to expand upon previous research on goal-related activation and inhibition by examining the impact of goals on the accessibility of relevant information. To this end, this paper will: 1) review the process of activation and suppression in the presence of goals, 2) develop a framework within which goal-related activation and suppression can be tested, 3) examine these effects both before and after goal completion, and 4) address the influence of goal commitment on attentional effects.

Goals

Whether they are long term or short term, goals affect our lives by providing a system of organization and motivation to guide our every day activities (Kruglanski, 1996). For example, the long term goal of a career in medicine is most likely prefaced by a goal to do well in undergraduate studies. This directs behavior on a broad level (study hard, make good grades, avoid academic-threatening distractions, etc.). More specifically, daily behavior can be shaped by the short term goal of earning an "A" on a bio-chemistry exam. In this instance the aspiring physician's immediate activities are focused upon preparation for an exam.

Over the years, goals have played a central role in many popular theories of motivation. Amongst these are Bandura's social cognitive theory (1986), Power's cybernetic control theory (1973), and rational control theory (Campion & Lord, 1982). In social cognitive theory, goals serve as a basis for comparison against self-observations in the context of self-regulation (Bandura & Cervone, 1983). To be more specific, goals represent desired future events that motivate a person's behavior. When an individual expects that specific behaviors lead to desired outcomes, he/she uses the goal as an internal standard against which to compare, regulate, and maintain his/her behavior. Control theory provides a more micro-level approach, wherein goals

are referred to as the referent. Discrepancies between the referent and the signal (or feedback), are monitored and can result in a change of behavior (Powers, 1973). In Campion and Lord's (1982) extension of this idea, rational control theory, the goal serves a similar function. Here the discrepancy is not always resolved by a change in behavior, but adds the possibly by an adjustment of the goal itself. Finally, the one goal-driven theory of motivation that has received the most attention (both support and criticism) is goal setting theory (Locke & Latham, 1990).

Goal Setting Theory. It has been largely suggested that differences in task performance between individuals with equal ability are caused by differences in motivation or environmental constraints (Campbell & Pritchard 1976; Kanfer, 1990). One key assumption of goal setting theory is that in order to understand motivational differences one also needs to understand the personal goals that individuals hold for a task. This theory is grounded on the premise that, holding all else constant (e.g., goal commitment, ability, self-efficacy, etc.), as goal difficulty increases, performance levels increase. This relationship, referred to as the goal difficulty function, has been supported by four separate meta-analyses (d = .52, Chidester & Grigsby, 1984; d = .55, Mento, Steel, & Karren, 1987, d = .82, Tubbs, 1986; d = .58 Wood, Mento, & Locke, 1987). To be more precise, this theory posits that if an individual's goal has a high level of difficulty he/she will be motivated to perform at higher levels than they would in the condition of easy goals. The explanation for this effect is that— given the assumption that the goal is accepted— difficult goals lead to greater effort, persistence, and more focused attention than easy goals (Locke & Latham, 1990).

Another basic premise of goal setting theory argues that greater specificity of a goal (i.e., obtain a high score vs. 90% accuracy) results in decreased variability of performance levels than when contrasted with an ambiguous, indefinite goal (i.e., do your best). Even though a do-your-best goal is difficult, the more detailed level of specificity provides a stringent framework within which to evaluate one's personal performance. That is, an individual whose goal is detailed and narrowly focused will have more exact expectations for how he/she should perform, enabling him/her to more quickly identify discrepancies from desired performance. This, in turn, enables individuals with specific goals to more quickly and accurately modify goal-striving efforts to achieve desired performance (Locke & Latham, 1990). It has been shown that conditions involving specific and difficult goals result in the highest levels of performance with the lowest variability (Locke, Chah, Harrison, & Lustgarten, 1989). The relationship between performance

levels and specific, difficult goals has also been supported by numerous empirical studies, as well as summarized in several meta-analyses, (Chidester & Grigsby, 1984; Hunter & Schmidt, 1983; Mento, Steel, & Karren, 1987; Tubbs, 1986; Wood, Mento, & Locke, 1987).

Locke and Latham (1990) identify three mechanisms through which goal setting operates to control behavior: effort, persistence, and direction. First, the difficulty level of a goal dictates the amount of effort and intensity of work that is allotted to accomplishing the goal. Numerous studies have shown that difficult and specific goals regulate physical effort put forth (Bandura & Cervone, 1983; Early, Wojnaroski, & Prest, 1987), the rate of work (Locke et al., 1970), self-report effort expenditure (Bryan & Locke, 1967a), effort inferences by a third party (Meyer, Konar, & Schacht, 1983), even physiological effort (Sales, 1970).

Second, in the absence of time constraints, a goal affects the persistence of work, or the duration of effort over time. For example, Bavelas and Lee (1978) showed that detailed and challenging goals lead individuals to work at a task longer than those with short, simpler goals. This is most prevalent when there are few time constraints (LaPorte & Nath, 1976). In addition, Cannon-Bowers and Levine (1988) found that subjects with difficult self-set goals spent more time on the task than subjects with easier goals. Similarly, when participants were allowed to choose the number of trials they wanted to take to learn a maze, Singer, Korienek, Jarvis, McCloskey, and Candeletti (1981) found that those with both short and long-term goals opted to take more than double the number of trials as those with no goals.

Third, and most relevant to our interests, is the idea that goals serve to direct attention (Locke & Latham, 1990; Moskowitz, 2002; Shah, Friedman, Kruglanski, 2002). Goals serve two directional purposes: to orient the person towards goal-related activities and away from un-related ones, and to activate goal-related knowledge and skills (Locke & Latham, 1990). A goal focuses an individual's attention on information and strategies in long-term memory that are relevant to achieving the goal (Locke & Latham, 1991). These direction effects go beyond attention and action to influence an individual's information processing (Cohen & Ebbesen, 1979), and encoding and memory (Hoffman et al., 1981). This aspect of goals is discussed further in a later section. In addition to these direct motivational influences— that is, they act automatically after there is commitment to the goal— indirect mechanisms (e.g., strategy development) have been shown to have a more cognitive influence on performance. Though strategy development can be construed as a directional mechanism, it is somewhat less

automatic, as it requires conscious planning or problem solving (Locke & Latham, 1990). This was demonstrated by Early et al. (1987), which showed that the relationship between goals and performance was partially mediated by planning. Further, when working towards a difficult goal, an individual's end satisfaction depends upon higher performance (Latham & Locke, 1991).

Activation and Inhibition

The environment is continuously presenting us with a stream of information from multiple sources, but due to the limitations of working memory, we are only able to process a portion of the stimuli we perceive (Hasher & Zacks, 1988). As previously mentioned, one of the proposed mechanisms of goals is their ability to focus attention (Locke & Latham, 1990; Moskowitz, 2002; Shah et al., 2002). Original theories of attention viewed this as a single excitatory process where conscious attention is likened to a spotlight, only highlighting information related to the specific task at hand (Allport, 1989; Kahneman & Treisman, 1984). More recently, attention research has emphasized a dual process model of attention. This dual model is described with the complimentary information processes of activation and inhibition. To be more specific, attending to a particular stimulus increases the availability of information related to that stimulus in long-term memory. This excitatory process allows for further deep-level processing of that stimulus and anything related to it. Alternatively, activation is augmented by a second mechanism, inhibition. Inhibition suppresses the processing of information that is related to the other, to-be-ignored stimuli. As a result, the information becomes relatively less accessible in long term memory, this engendering the ease of accessibility of information related to the true focus of attention (Fox, 1995; Neill, 1977; Neill, Valdes, & Terry, 1995; Tipper, 1985). So in short, not only is relevant information illuminated by a spotlight, but irrelevant information is concealed behind a figurative cognitive curtain.

Priming and negative priming tasks are the procedures commonly used to measure activation and suppression (May, Kane, & Hasher, 1995). Negative priming is revealed when subsequent responses to an ignored object are slower or less accurate than are responses to a new object. This is contrasted with positive priming, where attending to an object facilitates successive responding (Allport, Tipper, Chmiel, 1985; Houghton & Tipper, 1994; May et al., 1995; Scarborough, Cortese, & Scarborough, 1977; Tipper, 1985). Both tasks involve the participant's ability to select a target (e.g., green word) from among distracters (e.g., red word) over a number of trials. When attention is given to a target, information related to the prime is

more readily accessible in working memory and responding to the same target on a second presentation is faster than responding to an unrelated target. This facilitating effect is referred to as priming. In a typical negative priming paradigm, the presentation of a target and a distracter takes place in one trial, and on a second trial the previous distracter becomes the target. Negative priming is said to occur when responding to the previously suppressed information is slower relative to control trials where the target was not previously a distracter. The increased or decreased accessibility of information is demonstrated by a difference in reaction times as compared to a control condition with neutral information; a faster (than control) reaction time (RT) indicates priming and a slower (than control) RT indicates negative priming (Fox, 1995; May et al., 1995).

Person perception research conducted within the social cognition literature offers an interesting insight to the presence of inhibition effects in the current study. In an impression-formation task, participants studied and recalled sentences describing a target person's behaviors. Results of this study showed that recall for behaviors incongruent with personality trait impression of the target was higher than recall for congruent behaviors (Hastie & Kumar, 1979). This effect has been further supported in a meta-analytic review of 60 studies (Rojahn & Pettigrew, 1992). One explanation of these results stems from Craik and Lockhart's (1972) depth of processing model. Because the incongruent behavior was novel or unexpected, it is processed at a deeper level, and is therefore slower to decay during retention period.

In reference to the current research, conflicting goal related information could be likened to incongruent behaviors. Based on these findings from person perception literature, it might be argued that finding inhibition effects, as defined presently, would be quite unexpected. In this light, one might actually anticipate information related to the conflicting goal to be more accessible than goal related information. However, it could likewise be argued that there are fundamental differences between the nature of these tasks and the operationalizations of attention that negate the inconsistencies between them. In Hastie and Kumar's research, the goal in the task at hand is to retain a series of statements about a person's behavior for recall at a later time. It is suggested that the primary mechanism employed in such an instance is to adopt the most cognitively efficient pattern for the encoding stage of information processing, (Macrae & Bodehausen, 2001). Therefore, information that is inconsistent with the primed category stands out and is thus more likely to be remembered. In the current research, neither the information

related to the goal nor ignored goal is required to be committed to memory. Therefore no encoding processes occur where cognitive efficiency is required and thus would suggest differential depths of processing. Participants are viewing the words (independent of the focal task for which the goal is employed) and are asked to make a judgment about what category they belong in.

Further, in Hastie and Kumar's (1979) study, attention is defined as the participant's success or failure in recall of congruent and incongruent behaviors. Alternatively, the present study defines attention in terms of relative accessibility of goal and ignored goal related information as compared to neutral information (i.e., how long it takes for the participant to make a decision about a word's proper categorical placement). It is surmised that these methodological differences are reflective of fundamentally different underlying constructs. As such, the findings of Hastie and Kumar (1979) were not projected to be manifested in the current study. Were this effect to be found it would be evidenced by heightened accessibility of both information related to the active goal and the ignored goal relative to control information.

Goals as a Source of Activation and Inhibition

Lord and Levy (1994) discuss a hierarchical organization of cognitive control systems that provide a way of regulating information processing. Central to the functions of knowledge and behavior regulation are the processes of activating relevant information and suppressing information that can derail goal-striving efforts. Goals function as a result of macro-level mechanisms (effort, persistence, and direction) and also micro-level processes associated with information processing. Goals have the capacity to direct human behavior because they rein our active minds by focusing our attention. Studying goal-related activation and suppression contributes to the growing understanding of the cognitive processes that guide our behavior in natural environments (Diefendorff, Lord, Hepburn, Quickle, Hall & Sanders, 1998).

Goschke and Kuhl (1993) conducted research concerning intentions or goals as a source of activation in working memory. A series of four studies showed that intention-relevant information was more strongly activated than intention-irrelevant information. In these studies, participants were required to learn short scripts describing simple activities (e.g., setting the table: spread the tablecloth, distribute cutlery, etc.). Subjects were told that details from both scripts would be tested in a recognition/RT task; specifically, depending on the assigned condition, participants would either be expected to execute one of the two scripts or identify

errors while observing someone else performing the script. In general, it was found that material related to the script that would either be executed or observed was responded to faster than information from the neutral script. Further, in comparing the RTs of participants who were expected to perform a script to those who were instructed to observe a script being acted out, it was found that RTs were significantly shorter when individuals had formed an intention to perform the activity themselves. This intention-superiority effect was supported even when controlling for encoding strategies and when participants were expecting to be retested via free-recall test for both scripts.

The work of Diefendorff et al. (1995) and Diefendorff et al. (1997) expanded this research on intention-related activation to include goal-related inhibition. Specifically, Goschke and Kuhl (1993) examined activation effects, whereas Diefendorff and colleagues investigated goal-related activation and inhibition in the presence of two competing goals. Diefendorff et al. (1995, 1997) employed a task wherein participants were directed to use one of two conflicting goals for responding to a series of work-related in-basket tasks. In both sets of studies, the two goals employed were a *productivity goal* (using a strategy to arrive at optimal levels of organization performance, regardless of human factors) or a *fairness goal* (making decisions based on consideration of individual needs and differences without concerns for the company). After developing a solution to the problem presented in each memo, participants engaged in a task to assess the activation of goal-related information or suppression of information related to the competing goal. These two studies differed largely in their assessment of activation effects. The first method simply asked participants to respond to words presented and indicate if they were consistent or inconsistent with the goal they had employed (Diefendorff et al., 1995). An improvement on this method involved a categorization task and added a set of control stimuli (creativity). Here participants were instructed to name the category to which each stimulus belonged (productivity, fairness, or creativity; Diefendorff et al., 1997). Across both studies, support was found for both priming effects of goal-related information and suppression effects of competing goal-related information. That is, RTs for goal related words were faster than those for control words and RTs for words related to the ignored goal were slower than those for control words (Diefendorff et al., 1995/1997). The support for both priming and negative priming effects found in these studies is consistent with the idea that both facilitating and

inhibiting mechanisms are needed to effectively pursue one goal in the presence of a conflicting other goal.

Marsh, Hicks and Binks (1998) and Marsh, Hicks, and Bryan (1999) also sought to replicate the intention-superiority effect of Goschke and Kuhl (1993). Using a method very similar to that of Goschke and Kuhl, Marsh et al. had participants learn two scripts, one which was to then be observed and the other which was to be performed. Thereafter, the researchers examined the accessibility of information – both before and after the intentions of observing or performing had actually been carried out – with a lexical decision task (wherein participants must distinguish between stimuli as being real words or nonsense words). Results indicated that participants responded more quickly to those words related to the script which they were expected to perform than they did to control words, confirming the activation hypothesis. Further, this effect was supported only prior to participants' acting out the script. Once the participant had fulfilled his/her intentions (performing the script) words related to the intention became deactivated or even inhibited; in other words, participants began responding to these words more slowly than they responded to control words (Marsh et al., 1998; 1999). According to the authors' explanation, once the individual has acted out his/her intentions; the heightened accessibility is no longer necessary and therefore subsides, even to the point of developing inhibition. One would assume that this is the case because the goal has essentially disappeared. Although not demonstrated, this same neutralizing effect might be anticipated for suppressed information so that once a goal has been enacted, suppressed information returns to a neutral state of accessibility (Marsh et al., 1998, 1999).

Meacham and Diefendorff (2001) sought to elaborate upon the work of Diefendorff et al. (1997). More specifically, this investigation examined activation and suppression of goal-related information when one goal was assigned and a second was ignored, when two goals were assigned simultaneously, and when participants were permitted to choose between the two goals. Taking into consideration the work of Marsh et al. (1998, 1999), these effects were also examined either prior to or upon completion of the goal(s). In general, results failed to support strong activation or suppression effects for goal-related information. However, there was slight (though insignificant) indication that in the presence of one or two assigned goals, activation of goal relevant information was stronger than that competing goal relevant information only prior to completion of the goal. Specifically, when participants were assigned one goal or when using

both goals, they responded to goal related information somewhat (not significantly) faster than control information when attention was assessed before writing down their solutions. Interestingly, in congruence with the findings of Marsh et al., (1997), these differences were completely non-existent after participants wrote down their solutions.

Kruglanski (1996) posits that goals represent cognitive entities equating to unique content and process knowledge that varies in the degree of connectedness and congruency the goal has with related constructs in memory. Like other knowledge structures, goals are influenced by the same processes that govern attainment, modification, and activation; and as such, can be made more accessible through environmental priming (Bargh & Barndollar, 1996). With this cognitive approach to motivation in mind, Shah and Kruglanski (2003) examined how the process of goal attainment automatically activates the goals they serve. This bottom-up priming was demonstrated by increased accessibility of goal words compared to control words in a lexical decision task. In addition, increased goal accessibility was shown to mediate the relationship between priming of goal attainment means and goal persistence and performance (Shah & Kruglanski, 2003).

In addition to bottom-up priming of goals, a growing body of research examines the extent to which goals influence self-regulation even when activated outside of participants' consciousness. Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trotschel (2001) subconsciously primed goals (achievement or cooperation) and demonstrated where these goals impacted subsequent participant behaviors. Additionally, short term motives or temptations (eat free pizza) have been found to automatically and subconsciously activate the long-term goals (eat healthy food) with which they interfere, and ultimately influence behavioral choices (Fishbach, Friedman, & Kruglanski, 2003). In a series of four studies, Shah and Kruglanski (2002) have found consistent evidence that subconscious priming of new goals can affect commitment to pre-existing goals. This "goal-pull" effect has further been demonstrated to be moderated by the extent to which the new goal impedes upon or facilitates pursuit of the original goal.

Most relevant of this line of social cognitive research is the recent work of Shah et al. (2002). Grounded in self-regulation theory, Shah et al.'s goal shielding theory posits that activation of primary goals inhibits the accessibility of competing goals. They argue that this inter-goal inhibition is a skill that individuals acquire gradually throughout development, and employ automatically without consciousness. This automatic inhibition of conflicting goals

functions as a result of characteristics of goals themselves – most notably goal commitment – and the motivational and affective context of the situation. Furthermore, the inhibition of alternative goals is strongest when they serve the same higher-order purpose as the primary goal and weakest when they facilitate focal goal attainment.

Across six studies, multiple methodological approaches, and diverse goal types – Shah et al. (2002) found a positive relationship between the degree of goal commitment and accessibility of goals, lending consistent support to their theory. Accessibility of specific goals was operationalized as either (a) participants including that goal when generating a list of goals, or (b) participants' latency in a goal recognition task. Specifically, they found that when goal commitment is high, accessibility of goal relevant material is enhanced, while accessibility of alternative goal material is reduced. In addition to goal commitment, other characteristics of the goals were found to influence the extent to which individuals experience inhibition of alternative goals. Examples include regulatory focus of the goals (promotion or prevention) and the extent to which achieving one goal facilitates or prevents attainment of another.

Present Investigation

Largely extending the work of Diefendorff et al. (1995, 1997) and Meacham and Diefendorff (2001), this study provides an examination of micro-level attentional mechanisms in the goal-performance relationship (see Figure 1). Explicitly, goal-related activation and suppression processes are observed within the context of a task that easily generalizes to the workplace, and employs a task using procedures analogous to that of priming and negative priming tasks. Specifically, participants concentrated on an assigned goal and suppressed an alternative competing goal when responding to a series of work-related in-basket tasks. These two qualitative goals suggest two potentially conflicting strategies for approaching work problems. It was anticipated that this procedure would result in activating information related to one goal (priming) and suppressing information related to the competing goal (negative priming). To assess these effects, participants responded to word stimuli related to both goals and unrelated or control words. Prior research has provided support for the use of priming and negative priming as means of observing how activation and suppression facilitate goal directed activity (Diefendorff et al., 1995, 1997; Meacham & Diefendorff, 2001). Based on this prior work, the following hypotheses are presented:

Hypothesis 1: Participants will respond to words that are related to the goal being used faster than they will respond to neutral words.

Hypothesis 2: Participants will respond to words that are related to the ignored goal slower than they will respond to neutral words.

Goal Completion

Marsh et al.'s (1998, 1999) findings suggest that the strength of activation and suppression effects are stronger prior to goal completion. In contrast, Diefendorff et al. (1995, 1997) found activation and suppression effects even after goal completion. If one considers that the participant's intention is to read and respond to an in-basket memo with a certain goal in mind, then the act of writing the response in and of itself is the fulfillment of that intention. It is likely that this difference in findings is a result of the type of task used to assess relative accessibility of goal related information. Previous studies (Marsh et al., 1998; 1999; Meacham & Diefendorff, 2001) employed a lexical decision task. This type of task asks participants to indicate if presented stimuli are real words or nonsense words. In as much, it requires no differential attention to the various categories of words, as the word/not a word distinction is very superficial (shorter RTs). Furthermore, while it provides a much cleaner measure of activation and suppression, the effect sizes of this measure are small (40-50 ms; Marsh et al. 1998), making it harder to find differences without unreasonably large sample sizes. A categorization task, as employed by Diefendorff et al. (1997), requires more in-depth processing of the stimuli (leading to longer RTs), and is more likely to tap into attentional differences at a level where the effects of a goal's directional influence can be assessed. While it was anticipated that the results of Diefendorff et al. (1995, 1997) would be replicated, it may be that stronger effects occur prior to goal completion. In light of these inconsistencies, the current investigation directly compares these two findings by measuring activation and suppression effects both prior to and after completing a written response to the memo.

When applying these findings to the current research it is important to consider that the goal completion effect could largely depend on what type of goal is being pursued and how frequently the goal is employed. Marsh et al. (1998, 1999) show this effect when the intention is a very specific and detailed behavioral intention which must be performed for the experimenter. The current paradigm however, employed a rather broad, overarching strategy to direct behavior. Also, the participant was aware that the task was hypothetical and that he/she was not expected

to actually execute the solution. It could be that behavioral intentions lose their capacity to direct attention after the fulfillment of that intention; while broader goals, like strategies, will endure after goal attainment. Furthermore, the current paradigm required participants to engage in goal behavior multiple times in succession, as opposed to just once as in the Marsh et al. (1998, 1999) studies. The participants' expectation of multiple trials wherein they would be required to employ that same goal again could lead to carryover effects. For these reasons, this effect may not be observed.

Despite these concerns, the findings of Marsh et al (1998, 1999) provide not only an intuitive explanation of goal-related activation, but significant empirical grounds on which to predict that the goal completion effect would influence the results of this study, even if the effect is not robust. Therefore, the following hypothesis is presented:

Hypothesis 3: The activation and inhibition effects will be stronger prior to goal completion.

Goal Commitment

In addition to understanding what purpose goals serve and the mechanisms through which they operate, it is necessary to consider an individual's perception of a goal in terms of his/her commitment to achieving the goal (Hollenbeck & Klein, 1987). Goal commitment refers to the degree to which a person adopts the goal and reflects his/her determination to accomplish the goal (Hollenbeck & Klein, 1987). Several empirical studies have indicated that commitment may moderate the effects of goals on performance (Erez & Zidon, 1984). That is, when commitment to a goal is high, the relationship between goals and performance is stronger than if the commitment is minimal (Erez and Zidon, 1984; Locke, 1968; Locke, Latham, & Erez, 1988). It has even been argued within goal setting literature that commitment is in fact necessary, such that in the absence of commitment, goals have no effect on performance (Latham & Locke, 1991). When a considered goal is more congruent with other goals already in place at both higher (e.g., personality) and lower levels (e.g., task strategies) of the goal hierarchy (Diefendorff & Lord, 2000), it is likely that the goal will be adopted and commitment will be high. Drawing the comparison to expectancy theory, Hollenbeck and Klein (1987) suggest this comparison process involves identifying the value of the goal (i.e. valence) and the likelihood of achievement (i.e. expectancy). Most directly, Shah et al. (2002) found support of commitment influencing accessibility of goals. Specifically, results indicated that high goal commitment (to

the primary goal) leads to enhanced accessibility (faster recognition) of goals and suppression (slower recognition) of alternative goals. Based on these collective findings, the following is proposed:

Hypothesis 4: Activation and inhibition effects will be stronger when the participant's goal commitment to the assigned goal is high.

Additional Influences on Activation/Inhibition Effects

There are a number of different factors that can affect the degree to which attention is aroused as a result of goals. Among these are the following: preferences between the two goal strategies, feasibility of the solution that the participant develops, as well as the participant's proclivity towards an action or state orientation. Each of these factors represents a potential source of variance in the strength of the activation and inhibition effects.

Goal preference. One explanation for the participants' deviation from the assigned goal in Diefendorff et al. (1997) might involve differences in the individuals' preferences for particular management styles. When goal commitment is viewed from an expectancy approach (Hollenbeck & Klein, 1987), preference for a goal is directly related to commitment to that goal. In some cases, such as the current investigation, one's commitment to a preferred goal may conflict with one's commitment to an assigned goal. As such, preference may possibly introduce noise into the results. To be more specific, if an individual has a strong preference to one style and is instructed to employ another, they will be required to contradict his/her preferred approach. When this occurs, the individual might simply be less committed to its success and consequently display smaller priming and negative priming effects than when employing the goal congruent with their preference. Another possibility could be that an individual forced to contradict their preference may still report strong commitment to the goal as a result of the specific situation. Under these circumstances, the lack of consistency between the assigned goal and preferred goal could attenuate the strength of activation or inhibition effects. It is therefore necessary to observe the influences of these differences.

Feasibility of solution. The participant's perceived feasibility of the solution refers to the degree to which the individual would actually choose to implement their proposed solution in the real world. This factor attempts to recognize that regardless of goal commitment or preference, a participant may or may not have confidence that they have developed a solution that appropriately addresses the problem at hand and could realistically be implemented. This factor

could also be construed as being indicative of the influence of the situation presented by the memo. It could be the case that the degree of an individual's confidence in the feasibility of the solution they propose – regardless of consistency of assigned goal to goal preference and commitment – would influence the strength of activation and inhibition effects. It is anticipated that increased confidence in the fidelity of the proposed solution will lead to stronger activation and inhibition effects.

Action-State Orientation. Lord and Levy (1994) argue that self-regulation is in part determined by an individual's conscious and unconscious suppression processes that allow an individual to stay focused on a given task. Kuhl's Action Control Theory (1994), posits that individual goal-oriented learning involves volitional, motivational, and strategic cognitive processes. In the context of this theory, the construct of action-state orientation was proposed as a basic determinant of goal-striving effectiveness. More specifically, it refers to an individual's capacity for initiating and maintaining action tendencies (or goal striving efforts) in the face of contending action tendencies. This basic indicator of regulatory effectiveness during goal pursuit is measured with the Action Control Scale (ACS-90). Action-oriented individuals are able to suppress intrusive thoughts and regulate their emotions for the purpose of focusing on completion of a goal. State-orientation, alternatively, is marked by the inability to put aside distractions. These individuals devote more cognitive resources to controlling their thoughts and feelings, and hence devote less attention to the successful completion of a given task (Kuhl, 1994). Within the construct of action-state orientation, it is further suggested that three dimensions can be distinguished: preoccupation, hesitation, and volatility. The dimension of preoccupation (vs. disengagement) indicates an individual's tendency to overtly process past, present, or future relevant information. Hesitation (vs. initiative) reflects the difficulty individuals have in initiating activities to achieve the goal (this dimension seems least likely to influence the current study). Volatility (vs. persistence) is representative of an individual's ability to persist with goal striving behaviors once they have started. In the context of this research, it seems that action-oriented individuals would have stronger activation and inhibition effects than state-oriented individuals. More specifically, action-orientation, in this case being able to disengage from irrelevant information and persist in goal striving efforts, should be directly related to the extent to which a participant's attention was focused on the goal at hand. As a result, his/her RTs should reflect these differences. That is, participants scoring on the action-

oriented poles of the preoccupation and volatility dimensions were expected to have stronger activation and inhibition effects than those scoring on the state-oriented poles of preoccupation and volatility dimensions.

Method

Participants

The 150 participants (73 males, 77 females) in this study were recruited from an advanced-level undergraduate management course. Students were mainly juniors (121) and seniors (28); only 1 sophomore participated. The sample ranged in age from 19 to 26 years, averaging at 20.6 years. Students were rewarded with extra credit in their coursework. As this type of research is dependent upon active, involved participation, an incentive of $50 was offered to the 3 individuals with the best performance on the task.

Design

This study is a three-level (repeated measures, trial, and person) completely nested within person design. Further, the final model represents a 3 (word category) x 2 (goal completion) x 2 (goal) x (goal commitment) mixed factorial design. Word category is a repeated measures variable, representing words related to one of three categories (individual, organizational, and creativity). Goal completion is also a repeated measures variable indicating whether the semantic categorization task occurred before or after writing down responses to the in-basket task. Goal and goal commitment are trial level variables representing one of two possible assigned goals for the trial (individual orientation or organizational orientation), and the participant's commitment to the goal (on a continuous scale), respectively. These variables are used to predict the dependent variable of reaction time (RT). Other variables influencing this relationship include goal preference, action-state orientation, and feasibility of the solution. All conditions are described in further detail below.

Procedure

The task was completed on personal computers using E-Prime software (version 1.0; Psychology Software Tools, Inc). Participants first responded to a few demographic questions, and completed both a short goal preference questionnaire and the ACS-90. Participants were then provided with explanations of the three word categories and were required to complete a semantic categorization task to derive a baseline measure of RT to all the stimuli used in the experiment.

Once all participants had completed this initial portion of the experiment, group instruction continued. Participants were instructed to assume the role of a personnel manager of a large manufacturing facility. They were then asked to complete an in-basket task that consisted of reading and responding to four memos (one memo for each trial) from employees and supervisors describing various personnel problems. Each participant was instructed to develop responses using one of two strategies: an organizational orientation or an individual orientation. They were further told to employ only the assigned strategy while avoiding use of the other. An organizational orientation (hereafter OO) was defined as using a strategy that arrives at optimal levels of performance for the organization, regardless of personnel factors. An individual orientation (hereafter IO) was defined as using a strategy that shows the most consideration and understanding to the workers, with less concern for other factors in the company. A creativity strategy was defined as striving to develop the most unique solution to the problem.

Before giving a detailed account of the task, the following synopsis is offered: After reading each memo, participants were asked to develop a solution and a plan of action using the strategy that was assigned. A short semantic categorization task (henceforth referred to as SCT, the details of which will be discussed later) was completed both before and after a participant wrote down his/her solution to the memo. Each trial concluded with a manipulation check of the goal assignment, a measure of goal commitment, and an indicator of the feasibility of the solution. As part of the group instruction, the experimenter walked through a sample trial so that participants could become familiar with the task and have the opportunity to ask any questions if the process was unclear. The remaining four experimental trials were completed at each participant's own pace (taking approximately 45 minutes) and were presented as follows:

For each trial, the participant pressed a key when they were ready to begin. He/she then saw a screen indicating goal assignment (IO or OO). At the second screen, participants were instructed to select a folder (selected at random) labeled A, B, C, or D from a pile to the right of the monitor. This screen further instructed them to read the memo contained therein and mentally develop a solution to the problem presented. A full minute of thinking time was modeled in the sample trial; however, in real trials, the time for reading and thinking was not constrained. Participants were to press a key when they were ready to continue. The participant then completed an 18-item SCT (described in full detail below). At the conclusion of this SCT, the participant was prompted to complete his/her response to the problem presented in the memo by

writing down his/her pre-formulated solution on the paper provided. This was followed by a second 18-item SCT. As a manipulation check on the goal assignment condition, participants were asked to indicate which of the two strategies they used. Finally, they completed a short measure of goal commitment and indicated on a 5 point scale the likelihood that they could actually implement their suggested solution (feasibility of solution).

Each individual was assigned a participant number at the onset of the experiment. Goal assignment was counterbalanced across individuals to control for order effects. Odd numbered participants were assigned OO, IO, OO, IO (in trials one through four respectively), and even numbered participants IO, OO, IO, OO. A test for order effects revealed no significant differences in RT, ($F_{(1,148)} = .735$, $p > .05$).

Semantic categorization task (SCT). One widely accepted model of semantic memory is the "spreading activation" model (Neely, 1991). This is the process whereby nodes of information are activated (or made more readily accessible) in a wavelike fashion moving outward from a starting node. Therefore, if the starting node is "cola" this can activate brand names, descriptive words, or any other information related to the term. A great deal of research has been conducted comparing various models of semantic memory and related methods of measurement. The results of Grainger and Frenck-Mestre, (1998), demonstrate that early semantic processing can be detected far more reliably with a categorization task than with a lexical decision task. This is potentially the predominant cause for the nonsignificant findings of Meacham and Diefendorff (2001); hence, this study employed a semantic categorization task (SCT). The purpose of this task was to assess the relative accessibility of goal-related information ac compared with neutral information. The SCT began with a brief description of the task and instructions. Participants were told that a series of words would appear, one by one, on the computer screen. As each word was presented, the participant would indicate, with a key press, to which of three categories the stimulus presented on the screen belonged: organization, individual or creativity. (On a standard keyboard, the function keys (F1-F12) are separated into groups of three. Each group of four keys was labeled and color coded with a template; pressing any one of the four keys in that grouping indicated a response for that category.)

Once they started, the following screens appeared cyclically: a pattern mask (1.5 seconds; to erase sensory memory of the previous word), a fixation point (1 second; to focus his/her eyes on the correct spot on the screen), and then the target word (this was chosen at random, and

remained on the screen until the participant's key response). A total of 18 stimuli were presented for each SCT trial: six OO related words, six IO related words, and six control words.

As participation in this study required 1.5 hours of a participant's time and required very engaged and attentive participation for a sometimes tedious task, an incentive was offered to participants. Three prizes of $50 each were awarded to the three individuals with best performance on the task. To determine these winners, all participants' solutions were scored by three independent raters. That is, each of four written memo responses from 150 participants were evaluated for effectiveness on a 1-5 Likert scale; where 1 = ineffective and 5 = very effective. As recommended by Hafsteinsson & Hauenstein (2004), given the inherent difficulties of calculating agreement with so few raters, overall agreement was not estimated. Rather, for 36.3% of participants, rater agreement was high, (r_{wg} = .84) for 3 out of 4 trials; and for 66.2% of participants, rater agreement was moderate, (r_{wg} = .50) for 3 out of 4 trials. While not ideal, under the circumstances (small number of raters), this showed sufficient agreement to justify aggregation of the raters' scores of effectiveness.

Materials

In-basket task. Further developing and refining the in-basket task memos used by Diefendorff et al. (1995), Diefendorff et al. (1997), and Meacham and Diefendorff (2001), eight revised memos were reviewed by graduate students to determine the degree to which each memo prompted a particular goal response (OO / IO). The perspective of the memos was held constant, in that all were from a supervisor and referred to a problem with a subordinate. Further, all memos reflected a similar structure (i.e., "here's the problem, can you help me?"). Four memos were selected for use in the study and one was selected for use in the sample trial. The final memos used in the experiment are included in Appendix A.

Semantic categorization task. The stimuli used in the SCT reflect words belonging to three categories, 24 of each: organization(OO)-related, individual(IO)-related, or creativity-related (control). To identify the stimulus material, a list of over 150 words (divided evenly between OO, IO, and control words) was compiled by the experimenter. These words were rated by a sample of 167 students in introductory psychology courses. Participants were provided with category definitions and then asked to place each word in one of the three categories. After categorizing the word, participants were asked to rate degree to which the word fits the category on a 5-point scale (a rating of "1" indicated that the word belongs in this category more so than

the others, a rating of "5" indicated the word was synonymous with the category). Percent agreement of category was assessed for each word (Suen & Ary, 1998) using the kappa coefficient to correct for chance agreement (Cohen, 1960). Remarkably, a limited number of words achieved the desired 80% level of agreement, (44 OO, 31 IO, 18 control). As comparatively few words were identified for the creativity category, six additional words were selected that did not meet the 80% standard (but had no less than 75% agreement). Therefore, selection of OO and IO words was constrained to the standards set by the available words in the creativity category. To the extent possible, words were matched for categorical agreement, number of letters and syllables, frequency of occurrence in the English language, and degree of category fit (Table 1).

A final set of 24 words from each category were selected for use in the study (Appendix B). Each SCT used six words from each category. Words were repeated, so that all words are used in trials one and two (being selected randomly from a list), then the list was refreshed and words were again selected at random for trials three and four. Preliminary analyses revealed that words were responded to significantly faster during the second exposure (M = 877 ms) than the first exposure (M = 910 ms; $F_{(1,574)} = 7.079$, $p < .01$). However, when word exposure (first vs. second) was modeled in HLM, the coefficient was not significant ($\gamma_{001} = 0.00173$; $t_{(148)} = 0.143$, $p > .05$). Since the differences are not significant when coupled with other factors of the study, this effect is not included in later analyses.

Goal commitment. A measure of 8 items was used to assess the participant's commitment to goal within each trial (Appendix C). This scale is based on Hollenbeck, Williams, and Klein's (1989) measure of goal commitment. Eight out of nine items have been modified to this task. The one item that was eliminated could not be adapted to make sense in this specific situation (e.g., Since it's not always possible to tell how tough this goal is, it's hard to take this goal seriously.) Across participants this measure showed good reliability, (Trial 1, $\alpha = 0.82$; Trial 2, $\alpha = 0.81$; Trial 3, $\alpha = 0.82$; Trial 4, $\alpha = 0.82$).

Goal preferences. A short, straightforward measure of 10 items was used to assess the participants' predispositions towards an organizational or individual orientation (Appendix D). The measure was based on the instrument employed by Meacham and Diefendorff (2001). Participants indicated their level of agreement on a 5-point Likert-type scale to a series of statements supportive of an individual orientation or an organizational orientation (i.e., The

needs of individual workers should not interfere with achieving organizational goals). As this paradigm views these two orientations to be on opposite ends of the same continuum, items supporting one attitude were reverse-scored, and preference was operationalized as the composite sum of these responses, $\alpha = .53$. A closer examination into the reliability measure has not offered much room for improvement, as deleting items with low item-total correlations does not significantly improve the situation. A factor analysis reveals the scale to have three primary components. Mainly items group on their direction of preference (items endorsing and individual or organizational orientation). The third factor seemed to be comprised of items that refer directly to using either of these strategies to make decisions about employees (items 1, 7, & 8). Removing these three items improved reliability moderately, ($\alpha = .60$). The final measure of preference is the sum of responses on a seven-item scale; scores range from 7 to 35 (midpoint = 21). Lower scores indicate a preference for an individual orientation. Higher scores represent a preference for an organizational orientation.

Meacham and Diefendorff (2001) found that the overwhelming majority of participants (undergraduates in psychology classes) indicated a preference for the fairness strategy (analogous to IO) over the productivity strategy (analogous to OO). While this could be a result of the liberal nature of students interested in psychology or college students in general, it was reasoned that this could be attributed to the social value of fairness. Similarly, differences between an individual orientation and an organization orientation are likely to be perceived as value laden (in favor of fairness to the individual). While an overt measure of preference as mentioned above is largely subject to social desirability, it may not be representative of the participant's natural reactions. In addition to preference, some other facet of the individual's life could cause differential a-priori priming of the categories. For example, the creativity category might be globally primed in comparison to the other categories if the student were active in creative arts.

Therefore in attempt to have a baseline measure of the participant's inherent reactions to these categories of words, each participant was asked to complete the SCT task at the beginning of the experiment before the categories were primed by the goal manipulation. Theoretically then, if categorical differences were held constant, this initial SCT would show no differences in RTs across categories except for those differences indicative of a participant's predisposition to respond to that category. If such differences did exist, in other words, the participant entered the

study with one or more of the three categories globally primed. Results of the baseline SCT indicate that across participants, there are significant differences in reaction time between word categories ($F_{(2,456)} = 16.452$, $p < .01$). Post-hoc Bonferroni tests revealed that participants responded to organizational words ($M = 1078$ ms) significantly faster than they responded to individual words ($M = 1366$ ms) or creativity words ($M = 1332$); there were no significant differences between individual and creativity words. This indicates a general bias in responding in favor of organizational words, which is to be expected given the differences in categorical fit revealed in pilot testing. However, not all participants showed this pattern of responding. In fact, only 102 participants responded to organization words more quickly than to individual and creativity words. Individual words showed the fastest mean RTs for 22 participants and creativity words showed the fasted mean RTs 26 participants. As such an individual level variable was created to reflect these differences in baseline responding by participants. Participants were coded for which of the three categories he/she had predisposition to respond fastest to (shortest mean RTs) and for which if the two experimental categories (individual/organization) he/she responded fastest. Earlier, it was speculated that baseline categorical differences in responding might be indicative of a participant's preference for one of the two goals. There is however, no significant relationship between an individual's predisposition to respond to one category faster than the other and his/her goal preference (as measured on 10-item Likert scale), as $r = .07$, $p > .05$ (Table 2). One explanation for the lack of relationship between these two variables is the extent to which the strength of category is overwhelming any differences that might otherwise be present. It could be the case that preference alone may not be enough to prime responding to that category in the baseline SCT when other factors of the situation might have more pressing influence. For example, a participant with an overall preference for the individual orientation might show faster baseline responses to the organizational category if he/she came to participate in the experiment immediately after management class.

Results

Data Screening and Outlier Analysis

The nature of the dependent variable, reaction times (RTs) to the SCT, is such that the data requires extensive screening and filtration to remove extreme outliers prior to any substantive testing of hypotheses (Fazio, 1990). Across a total of 156 participants, each completing four trials, consisting of two SCTs of 18 words each, a total of 22,464 observations

of RT were collected. One trial from each of five individuals was eliminated based on annotations made by the experimenter at the time of data collection (i.e.; failure to follow instructions), resulting in the loss of 180 (0.8%) SCT responses.

If one considers the framework of the SCT, there is naturally a minimal amount of time required for any individual to see the stimulus on the screen, make a decision about its categorical status, and key the appropriate response. As such, in concordance with other RT studies, any RTs faster than 300ms were excluded to eliminate the influence of very fast responses most likely due to random responding on behalf of the participant (Fazio, 1990). A total of 61 fast responses were recorded, 57 of which were distributed between three participants. Since such a large number of fast responses indicate a general lack attention to the task, these three participants were excluded from analyses resulting in a total loss of 432 (1.92%) observations. The remaining four fast responses were considered anomalies, and were therefore omitted from analyses leaving the all other responses in the affected trial in tact (0.01%).

The first manipulation check for each trial asked participants to report which goal they actually used to respond to the memos. If the participant's response to this check was inconsistent with the goal that was actually assigned for the trial, it was impossible to examine activation and inhibition effects (as inconsistencies could result from either error in responding or use of the incorrect goal); resulting in the loss of all observations for the given trial. This was the case in one trial for each of 25 participants, equating to a loss of 900 RTs (4.01%). In addition, after observing which specific individuals experienced goal inaccuracies, it was noted that three of these individuals also had one other trial dropped initially based on events noted at the time of data collection. Considering that two such errors were likely indicative of inattention to the task, and further that they have only two valid trials remaining in the data set, these three participants were therefore excluded from subsequent analyses; equating to an additional loss of 216 (0.96%) observations.

As extreme latencies in responding can often be assumed to be non-task related (i.e., the result of some momentary distraction such as sneezing or purposeful delay in responding), all extreme times were filtered for outliers within each individual. RTs that were three standard deviations or more above the mean for goal-related words or control words (in a within-subject analysis) were excluded, resulting in the removal of 750 observations (3.34%). After cleaning the

data, 150 participants remained in the study with a total of 20,298 observations at the repeated measures level. This equates to a net loss of 9.64% of the original data.

The nature of raw response latency data is such that even under the ideal conditions, with carefully phrased instructions and multiple trials, the data is positively skewed. Even before extreme scores are removed, the majority of responses fall into the lower range of data, with relatively few outliers of higher value. This violates the basic assumption of normality for most data analyses. Thus, a logarithmic transformation of raw RTs is a common method employed to compensate for this situation (Fazio, 1990). This transformation has the effect of bringing the outlier tail closer to the center of the distribution, and therefore rendering the mean a more precise expression of central tendency of the real distribution. Consequently, all of the following analyses are computed using logarithmic transformations of the dependent variable, RT. (Before transformation, kurtosis and skewness statistics were 2.8 and 12.77 respectively. After transformation, kurtosis and skewness were 1.08 and 1.3 respectively.)

Multilevel analyses: Hypothesis Testing

In similar studies, more traditional analyses like multiple regression or analysis of variance have been utilized for hypothesis testing. In such analyses, all variables would be analyzed simultaneously by aggregating or disaggregating all data to a single level of measurement (e.g., Diefendorff et al., 1997; Marsh et al., 1998). When higher level variables are disaggregated to a lower level of analysis, the assumption of independence of observations is undermined. Further, because the sample size is then determined by the number of lower-level observations, the standard errors and resulting statistical inferences are compromised. Likewise, such approaches that aggregate lower level data to higher levels restrict or ignore the amount of within-trial variability represented in the data (Bryk & Raudenbush, 1992; Hoffman, 1997). Hierarchical linear modeling (HLM), however, is unique in that it allows for simultaneous examination of data at multiple levels of analysis. HLM fits a regression equation at the repeated-measures level, lets parameters of the regression equation vary by a higher level such as trial and then uses trial-level variables to explain variation in the measures-level parameters, and allows you to test for main effects and interactions within and between levels (Bryk & Raudenbush, 1992).

The variables gathered in the course of this research exist on three levels. The most apparent is the level of the individual, heretofore referred to as Level 3. All data that reflect

something about the individual exist at this level. These are primarily measures of individual differences (goal preference and action-state orientation). Each participant completed four trials of the experimental task. All data that was collected within and refers solely to the context of a single trial will be referred to as Level 2. These include manipulated factors, such as the goal he/she was instructed to use and which memo was assigned for that specific trial. In addition to factors of design, participants' degree of commitment to the assigned goal was assessed for each trial, as well as degree to which the participant found the solution he/she developed to be feasible. Descriptive statistics and intercorrelations of all measured variables at Levels 2 and 3 are presented in Table 2. Finally, each trial consisted of two SCTs, one in the pre-goal completion condition (before the response was written) and the other in the post-goal completion condition (after writing the response). Further, each SCT consisted of 18 responses to words. The category of the word (individual, organizational, or creativity related) also represents a factor. The logarithmic transformations of RT to the SCT represent repeated measures of the dependent variable. All of these variables at the lowest level of data collection are considered to be at the repeated measures level or Level 1.

Partitioning variance: The unconditional model. In this study it was hypothesized that participants' reaction times on the SCT would vary as a result of variables at the repeated measures level (Level 1; word category and goal completion), and at the trial level (Level 2; goal and commitment to the goal). In addition to hypothesized relationships, it is thought that individual level (Level 3) variables such as a participant's action-state orientation or goal preference could influence the dependent variable as well. It is therefore necessary for there to be significant within and between-trial variance in reaction time as well as within and between-individual variance. This can be assessed by estimating an HLM model with no predictors at any level. This model is referred to as the unconditional model or the one-way analysis of variance. Within this framework the outcome variable is reaction time (RT) and the model can be defined as follows:

Level 1: $RT = \pi_0 + e$
Level 2: $\pi_0 = \beta_{00} + r_0$
Level 3: $\beta_{00} = \gamma_{000} + u_{00}$

This model allows the total variability in RT to be partitioned into three components: (1) within trial, (2) between trials, within individuals, and (3) between individuals. The results indicate that for RT, the Level 1 repeated measures variance component (within trial) is 0.019.

The Level 2 trial variance component (between trials, within individuals) is 0.00059. The Level 3 variance component (between individuals) is 0.0059. The small size of these variance components would seem to indicate that in fact a very small percentage of variance is explained in this model. However, these small variances are due in fact to the logarithmic transformation of RT (i.e., pre-transformation RT S^2 = 176954.06; post-transformation RT S^2 = .025). In any case, chi-square tests of these variance components reveal them to be significantly different from zero, (as will be shown). Dividing any one of these variance components by the sum of all three will provide an indication of the proportion of variance at each level. Results reveal that the majority of variance, 74.41%, is within trials. Likewise, 2.32% of the variance is between trials, within individuals, which is significantly different from zero, ($\chi^2_{(426)} = 621.28$, $p < .001$). Finally, 23.27% of variance is between individuals, also significantly different from zero, ($\chi^2_{(149)} = 3126.52$, $p < .001$). Results satisfy a primary assumption of HLM; that is, as a significant amount of variance is distributed across these three levels, proceeding to test a three-level model is indeed warranted.

Hypotheses 1 and 2: Slopes and intercepts as outcomes. Hypothesis 1 is concerned with the presence of an activation effect. It was predicted that, across trials and goal completion conditions, participants would respond more quickly to words related to the assigned goal than they would to control words. Consistent with Diefendorff et al. (1997), both activation and inhibition effects are modeled as an interaction between word category and assigned goal. As the Level 1 variable of word category consists of 3 categories, this must be modeled with two effect-coded variables: IWord (where individual words = 1, organizational words = 0, and control words = -1) and OWord (where individual words = 0, organizational words = 1, and control words = -1). These two variables are entered simultaneously and used to predict RT in the following model.

Level 1: $RT = \pi_0 + \pi_1(IWord) + \pi_2(OWord) + e$
Level 2: $\pi_0 = \beta_{00} + r_0$
$\pi_1 = \beta_{10} + r_1$
$\pi_2 = \beta_{20} + r_2$
Level 3: $\beta_{00} = \gamma_{000} + u_{00}$
$\beta_{10} = \gamma_{100} + u_{10}$
$\beta_{20} = \gamma_{200} + u_{20}$

Tests of this model reveal word category to be a primary influence on RT. Specifically, the slope of IWord was significant as $\pi_1 = 0.039$, $t_{(149)} = 19.86$, $p < .001$. The slope of OWord

was likewise significant as $\pi_2 = -0.039$, $t_{(149)} = 19.05$, $p < .001$. This clearly indicates that the category of the word has a main effect on RT. The residual Level 1 variance component can be subtracted from the total Level 1 variance from the null model and then divided by the original Level 1 variance to assess how much variance is explained by this new model (a pseudo R^2) the comparison yields a value of .9688. That is to say that word category accounted for 96.88% of Level 1 variance in RT. Even though word category accounts for the majority of variance in RT, there is a significant portion of variance left unexplained at Levels 1 and 2 ($\chi^2_{(276)} = 624.36$, $p < .001$) and Level 3 ($\chi^2_{(149)} = 3111.20$, $p < .001$).

The Level 2 variable of goal references the strategy (OO, IO) that was assigned to direct a participant's development of a solution to the problem presented by a memo. This variable (OrgGoal) was dummy coded (IO = 0, OO = 1). Before testing the activation/inhibition effects, goal conditions must be tested for a main effect. This is done by regressing OrgGoal on the intercept terms from the Level 1 equation. Here an *intercepts as outcomes* model tests the main effect for goal:

Level 1: $RT = \pi_0 + \pi_1(IWord) + \pi_2(OWord) + e$
Level 2: $\pi_0 = \beta_{00} + \beta_{01}(OrgGoal) + r_0$
$\pi_1 = \beta_{10} + r_1$
$\pi_2 = \beta_{20} + r_2$
Level 3: $\beta_{00} = \gamma_{000} + u_{00}$
$\beta_{01} = \gamma_{100} + u_{10}$
$\beta_{10} = \gamma_{100} + u_{10}$
$\beta_{20} = \gamma_{200} + u_{20}$

It was revealed that there were no significant differences in RT between goal conditions as $\beta_{01} = -0.00037$, $t_{(149)} = -0.15$, $p > .05$.

The actual test of activation and inhibition hypotheses involved an interaction between word category and goal condition. To review, activation is found if goal-related words are responded to faster than control words. Therefore, in a trial where the assigned goal was an individual orientation, individual-related words should prompt faster responses than control words. Inversely, inhibition is said to occur if words related to the conflicting goal are responded to more slowly than control words. So in the same trial with an individual orientation goal, words related to the organization should evoke slower reaction times that control words. To create this cross-level interaction, goal should be entered at Level 2 as a predictor of the slopes of word category from Level 1. The resulting *intercepts and slopes as outcomes* model is as follows:

Level 1: $RT = \pi_0 + \pi_1(IWord) + \pi_2(OWord) + e$
Level 2: $\pi_0 = \beta_{00} + \beta_{01}(OrgGoal) + r_0$
$\pi_1 = \beta_{10} + \beta_{11}(OrgGoal) + r_1$
$\pi_2 = \beta_{20} + \beta_{21}(OrgGoal) + r_2$
Level 3: $\beta_{00} = \gamma_{000} + u_{00}$
$\beta_{01} = \gamma_{100} + u_{10}$
$\beta_{10} = \gamma_{100} + u_{10}$
$\beta_{11} = \gamma_{100} + u_{10}$
$\beta_{20} = \gamma_{200} + u_{20}$
$\beta_{21} = \gamma_{100} + u_{10}$

Tests of this model result in nonsignificant Level 2 coefficients for goal as a of both Level 1 word category variable slopes as $\beta_{11} = 0.0023$, $t_{(149)} = 0.87$, $p > .05$, for IWord and $\beta_{21} = -0.00060$, $t_{(149)} = -0.231$, $p > .05$, for OWord. (See Figure 1 and Table 3). These results indicate that there is no significant interaction between word category and goal. As such, there is no support for either activation or inhibition effect – Hypotheses 1 and 2 are not supported.

Strictly speaking, as the remaining hypotheses refer to moderators of existing activation and inhibition effects, the lack of significant findings for these attentional effects makes the remaining hypotheses moot. However, it will further be demonstrated that they do not emerge in the presence of these additional factors.

Hypothesis 3. The next hypothesis proposed goal completion to be a moderator of activation and inhibition effects. To review, goal completion refers to whether the SCT was completed prior to or after having written down a solution to the memo. Specifically, it was predicted that the activation and inhibition effects of Hypotheses 1 and 2 (respectively), would be stronger in the pre-goal completion SCT that in the post-goal completion SCT. The test of this hypothesis introducing an goal completion variable at Level 1 (coded as: pre-goal completion, 0; post-goal completion, 1). Further, the nature of this prediction implies a three-way cross level interaction; word category x goal x goal completion. Word category and goal completion are both Level 1 variables. An interaction at the same level in HLM is defined similarly to those in multiple regression; that is, a product term is created from the two variables.

A strict examination of this hypothesis would be very complex and unnecessarily cumbersome. The exponential growth of the model that would necessarily result from the addition of 3 more Level 1 predictors (main effect term for order and interaction terms for order with each of the two word category effect variables) renders proper tests impossible. In short, with the current data, there is not enough power to estimate all parameters in such a model. A

more parsimonious approach therefore might feature splitting the data between pre and post goal completion conditions, and then testing the most recent model on each. Assuming, as predicted, that attentional effects are strongest in the pre-goal completion condition, a test on just that portion of the data is representative of the most liberal conditions under which these effects might emerge.

The results of such a treatment reveal nearly identical models in pre, post, and across goal completion conditions (see the Table 3). Wherein, word categories were significantly different, but no other significant main effects or interactions were found. Failure to find attentional effects under these circumstances, provides evidence against goal completion moderation. It is therefore concluded that Hypothesis 3 is not supported. As such, goal completion was not factored into any further analyses; rather the remaining analyses collapse data across goal completion conditions.

Hypothesis 4: Slopes and intercepts as outcomes. Hypothesis 4 predicted that activation and inhibition effects would be stronger when commitment to the goal is high than when commitment is low. In this study, goal commitment was assessed once during each trial, in reference to the goal as it was assigned and consequently used for that trial. Goal commitment therefore, represents a single measure that impacts all observations in that trial, hence constituting a Level 2 variable.

Variables at Level 2 can be introduced to examine main effects or cross-level interactions by using these variables as predictors of either the intercepts or slopes (respectively) from Level 1. For example, if one was interested solely in the main effect of goal commitment, this would be tested with an intercepts as outcomes model; wherein, commitment would be regressed on the intercept from Level 1. Alternatively, the hypothesis predicting goal commitment as a moderator on the relationship between attentional effects and RT implies a three way interaction between word category, goal, and commitment. As goal and commitment are both Level 2 variables, this requires the use of a product variable of goal by commitment (G x C). This interaction term, when regressed on the slopes from the two Level 1 word category variables provides the test of this effect. The complete intercepts and slopes as outcomes model would be represented as follows:

$$\textbf{Level 1:} \quad RT = \pi_0 + \pi_1(IWord) + \pi_2(OWord) + e$$

$$\textbf{Level 2:} \quad \pi_0 = \beta_{00} + \beta_{01}(OrgGoal) + \beta_{02}(Commitment) + r_0$$

$$\pi_1 = \beta_{10} + \beta_{11}(OrgGoal) + \beta_{12}(Commitment) + \beta_{13}(G \times C) + r_1$$

$$\pi_2 = \beta_{20} + \beta_{21}(\text{OrgGoal}) + \beta_{22}(\text{Commitment}) + \beta_{23}(\text{G x C}) + r_2$$

Level 3:
$$\beta_{00} = \gamma_{000} + u_{00}$$
$$\beta_{01} = \gamma_{100} + u_{10}$$
$$\beta_{02} = \gamma_{100} + u_{10}$$
$$\beta_{10} = \gamma_{100} + u_{10}$$
$$\beta_{11} = \gamma_{100} + u_{10}$$
$$\beta_{12} = \gamma_{100} + u_{10}$$
$$\beta_{13} = \gamma_{100} + u_{10}$$
$$\beta_{20} = \gamma_{200} + u_{20}$$
$$\beta_{21} = \gamma_{100} + u_{10}$$
$$\beta_{22} = \gamma_{100} + u_{10}$$
$$\beta_{23} = \gamma_{100} + u_{10}$$

In this case β_{02} represents the main effect of commitment on RT; β_{12} and β_{22} represent the commitment by word category interaction. Finally, β_{13} and β_{23} are the full three way interactions.

Whereas all previous predictors in these models have been categorical variables, commitment was the first continuous variable to be added to the model, and as such, the first to raise the issue of centering. One of the main implications for centering decisions in multiple regression lies in the logical interpretation of the intercepts. In this scenario, the scale used to measure commitment ranges from 10-40. Since an individual can not have zero commitment, the intercept cannot be directly interpreted. However, in HLM, centering decisions also have additional repercussions on the variance of intercept terms across groups (Hoffman & Gavin, 1998, Raudenbush & Bryk, 2002). Group mean centering would in this situation refer to the mean of commitment within an individual. Here, this seemed an illogical choice given that there are only four observations of commitment for any individual. Any one extreme observation then has undue influence on the other observations. Grand mean centering, while reducing problems of multicollinearity, can confound a cross-level interaction with a between group interaction (Hoffman & Gavin, 1998). However, it has been concluded that equivalent models are produced by both grand mean centering and use of the raw metric (Kreft, de Leeuw, & Aiken, 1995). Therefore, both commitment, and the G x C product term were grand mean centered.

Results indicate that there was no main effect of commitment on reaction time, as commitment was regressed on the Level 1 intercept, ($\pi 0$); $\beta_{01} = -0.0010$, $t_{(149)} = -0.28$, $p > .05$. However, the remaining results of this model reveal mixed effects between the two effect-coded proxy variables for word category (IWord and OWord). The OWord predictor (π_2) continued to have a significant main effect on RT, but the three way interaction ($\beta_{23;}$ OWord x Goal x Commitment) was not significant ($\beta_{23} = 0.00070$, $t_{(149)} = 1.14$, $p > .05$; Table 4). Conversely, the

IWord (π_1) predictor lost significance as a main effect, and the corresponding three-way interaction ($\beta_{13;}$ IWord x Goal x Commitment) was significant; $\beta_{13} = -0.0016$, $t_{(149)} = -2.63$, $p < .01$.

The complicated process of interpreting these results is somewhat relieved by examining graphical representations (see Figures 2 and 3) of the model. In both graphs, it is still apparent that organizational words are always faster than creativity words, which are always faster than individual words. The additional point of interest is that despite pure activation and inhibition as defined in reference to control words, goal-related words were always faster than conflicting goal related words. It is worthy to note that these differences are significant in spite of the vastly overpowering influence of word category. While the substantial main effect of words masks the ability to interpret this as true activation and inhibition; this does provide mild support for Hypotheses 1 and 2. Results suggest that, were categorical differences to be resolved, results might be more promising.

Examining differences between these two graphs further reveals another interesting effect. Based on interpretation of these effects as plotted with individual words (Figure 3b), as commitment increased individual words were responded to slower, and organizational words were responded to faster. However, if examining these effects as plotted with organizational words (Figure 3a), there were no differences between levels of commitment. Although findings are mixed, findings suggest an interaction of commitment with word category. Ultimately, in the absence of initial support for activation and inhibition, and furthered by the mixed findings discussed here, it was concluded that the results failed to support Hypothesis 4.

In all preceding analyses, all variables were tested as random effects. That is to say that all error terms in the preceding models were not fixed but allowed to vary. Speaking conceptually, the levels of the manipulated variables in this study (goal and word category) do not represent all possible goals or categories of words to which the results of this research would hopefully generalize. As such, these variables still represent random effects. However, conventional HLM practice calls for model simplification whenever possible. Fixing effects requires HLM to estimate fewer parameters, and consequently increases power. To fix effects, the error term is simply removed from the Level 3 equation representing the variable in question. As this design is complex, a final model was estimated where manipulated variables (goal and word category) were modeled as fixed effects:

Level 1: $RT = \pi_0 + \pi_1(IWord) + \pi_2(OWord) + e$

Level 2: $\pi_0 = \beta_{00} + \beta_{01}(OrgGoal) + \beta_{02}(Commitment) + r_0$

$\pi_1 = \beta_{10} + \beta_{11}(OrgGoal) + \beta_{12}(Commitment) + \beta_{13}(G \times C) + r_1$

$\pi_2 = \beta_{20} + \beta_{21}(OrgGoal) + \beta_{22}(Commitment) + \beta_{23}(G \times C) + r_2$

Level 3: $\beta_{00} = \gamma_{000} + u_{00}$

$\beta_{01} = \gamma_{100}$

$\beta_{02} = \gamma_{100} + u_{10}$

$\beta_{10} = \gamma_{100}$

$\beta_{11} = \gamma_{100}$

$\beta_{12} = \gamma_{100} + u_{10}$

$\beta_{13} = \gamma_{100} + u_{10}$

$\beta_{20} = \gamma_{200}$

$\beta_{21} = \gamma_{100}$

$\beta_{22} = \gamma_{100} + u_{10}$

$\beta_{23} = \gamma_{100} + u_{10}$

Primary results of the simplified model are the same as the previous model with all random effects. The real benefit of this treatment is that with the decrease in the number of parameters estimated, there is a coinciding power increase. In the former model (all random effects), there were too few degrees of freedom for HLM to estimate the significance of the Level 2 variance components. This is resolved in the later model (with fixed effects) and permits more thorough exploratory analyses. (To compare residuals between these two models, see Table 5.)

Multilevel analyses: Exploratory

Given that a substantial portion of the variance in this model is yet unexplained at Levels 1 and 2 ($\chi^2_{(275)} = 625.10$, $p < .05$) and Level 3 of the model ($\chi^2_{(148)} = 1967.27$, $p < .05$), additional exploratory analyses were conducted to attempt to account for it. It was anticipated that in addition to activation and inhibition effects, goal completion and commitment; three additional variables were posited to bear an impact on these effects: feasibility of solution, goal preference, and action-state orientation. To conduct exploratory analyses, new variables are plotted against the residuals from portions of the model. For example: if one were interested in whether or not preference has a main effect on RT, preference would be plotted against the intercept residuals (β_{00}). But if you wanted to see if preference interacted with word category, you would plot preference against the slopes residuals from both word proxy variables (β_{10} and β_{20}).

At the end of each trial participants were asked to report how feasible their solution would be if it were to be actually implemented in a real situation. In order to examine the effects of solution feasibility (a Level 2 variable) on RT, feasibility was plotted against residuals from Level 1. There was a significant amount of residual variance in Level 1 intercepts ($\chi^2_{(275)} =$

625.10, $p < .05$). Examination of the resulting scatter plot (Figure 4) suggested there was no relationship between how feasible a participant found his/her solution and RT.

In the final model with fixed effects, there was a significant amount of residual variance in the intercept term (β_{00}; $\chi^2_{(148)} = 1967.27$, $p < .05$) and the slopes for the goal x commitment x IWord interaction (β_{13}; $\chi^2_{(148)} = 182.79$, $p < .05$). Therefore ASO and preference can only be assessed for their main effects on RT, and interaction with commitment and activation/inhibition effects.

As you will recall, earlier it was mentioned that participants' were effect coded in terms of which category of words he/she responded to fastest during the baseline SCT; (yielding two effect variables: IndFast (1 = individual words were fastest) and OrgFast (1 = organizational words were fastest). The contrast category (-1) in both of these is when control words were fastest. Further, participants were dummy coded for baseline binary preference (which of the two main categories had a faster mean reaction time). These individual level variables were plotted against residual intercepts (to determine if they appear to have a main effect on RT) and the residual slopes of the commitment x goal x IWord term. A visual examination of the resulting scatter plots revealed no apparent relationships between these variables (Figure 5, binary preference; Figure 6, OrgFast and IndFast). The overt 7-item measure of preference was also plotted against residual intercepts and residual slopes of commitment. While, there is no apparent relationship with the commitment x goal x word category term, preference does appear to have a positive relationship with RT (Figure 7).

To further test this main effect of preference, another HLM model was estimated, adding preference as a Level 3 predictor of the intercepts. The preference scale was designed to identify an individual's preference between the two goals used in this study. Scores range from 10-35, scores closer to 10 representing a preference for the individual orientation and scores closer to 35 representing a preference for the organizational orientation (21 represents the midpoint of this scale; across participants $M = 31.34$). Because this scale has no true zero point, the variable was grand mean centered. The resulting model is as follows:

Level 1: $RT = \pi_0 + \pi_1(IWord) + \pi_2(OWord) + e$

Level 2: $\pi_0 = \beta_{00} + \beta_{01}(OrgGoal) + \beta_{02}(Commitment) + r_0$

$\pi_1 = \beta_{10} + \beta_{11}(OrgGoal) + \beta_{12}(Commitment) + \beta_{13}(G \times C) + r_1$

$\pi_2 = \beta_{20} + \beta_{21}(OrgGoal) + \beta_{22}(Commitment) + \beta_{23}(G \times C) + r_2$

Level 3: $\beta_{00} = \gamma_{000} + \gamma_{001}(Preference) + u_{00}$

$\beta_{01} = \gamma_{100}$

$\beta_{02} = \gamma_{100} + u_{10}$
$\beta_{10} = \gamma_{100}$
$\beta_{11} = \gamma_{100}$
$\beta_{12} = \gamma_{100} + u_{10}$
$\beta_{13} = \gamma_{100} + u_{10}$
$\beta_{20} = \gamma_{200}$
$\beta_{21} = \gamma_{100}$
$\beta_{22} = \gamma_{100} + u_{10}$
$\beta_{23} = \gamma_{100} + u_{10}$

Results indicate a significant main effect of preference on RT ($\gamma_{001} = .00157$, $t_{(148)} = 2.131$, $p < .05$), such that as preference scores are higher (individuals have a preference for organizational orientation) RTs are slower (see Figure 8). The pseudo R^2 was calculated, and indicates that preference accounted for 3.24% of variance in RT ($\chi^2_{(147)} = 1191.02$, $p < .05$).

To examine the potential of ASO having some bearing on the current model, each of the subscale scores of the ASO (preoccupation, hesitation, and volatility) and the ASO total score were plotted against both the residual intercepts and the residual slopes of the commitment x goal x IWord term. After examining the subsequent scatter plots (Figure 9) it is concluded that most of these relationships are not meaningful. Volatility, however, appeared to interact with the intercept residuals. As a result, and additional model was fitted testing the main effect of volatility on RT:

Level 1: $RT = \pi_0 + \pi_1(IWord) + \pi_2(OWord) + e$
Level 2: $\pi_0 = \beta_{00} + \beta_{01}(OrgGoal) + \beta_{02}(Commitment) + r_0$
$\pi_1 = \beta_{10} + \beta_{11}(OrgGoal) + \beta_{12}(Commitment) + \beta_{13}(G \times C) + r_1$
$\pi_2 = \beta_{20} + \beta_{21}(OrgGoal) + \beta_{22}(Commitment) + \beta_{23}(G \times C) + r_2$
Level 3: $\beta_{00} = \gamma_{000} + \gamma_{001}(Volatility) + \gamma_{002}(Preference) + u_{00}$
$\beta_{01} = \gamma_{100}$
$\beta_{02} = \gamma_{100} + u_{10}$
$\beta_{10} = \gamma_{100}$
$\beta_{11} = \gamma_{100}$
$\beta_{12} = \gamma_{100} + u_{10}$
$\beta_{13} = \gamma_{100} + u_{10}$
$\beta_{20} = \gamma_{200}$
$\beta_{21} = \gamma_{100}$
$\beta_{22} = \gamma_{100} + u_{10}$
$\beta_{23} = \gamma_{100} + u_{10}$

Volatility proved to be a significant predictor of RT ($\gamma_{001} = .0039$, $t_{(147)} = 2.62$, $p < .05$),

such that as volatility score increases, RTs are faster (see Figure 10). The pseudo R^2 was calculated, and indicates that volatility accounted for 3.7% of variance in RT ($\chi^2_{(146)}$ = 1812.4604, $p < .05$).

Discussion

Findings

None of the proposed hypotheses garnered significant support. Largely, this was due to methodological flaws in the implementation of this study, which are discussed below. In the final tests of this model, weak support was found for the presence of activation and inhibition effects, as well as the importance of commitment. However, replication and design improvement are in order for any worthwhile implications to be drawn, either practical or theoretical.

The first two hypotheses of this study were aimed at providing evidence for the operation of attentional processes (activation and inhibition) in response to having a goal for complex task. Specifically, Hypothesis 1 predicted the presence of activation effects; goal-related words were expected to be responded to faster than control words. Hypothesis 2 predicted the presence of inhibition effects; counter goal related information would be responded to slower than control words. Neither of these hypotheses was supported by the current study. The inability to establish the presence of these basic attentional processes was attributed to a number of design flaws discussed in context of limitations of the current study.

Hypothesis 3 anticipated that activation and inhibition effects would be stronger before goal completion than after. As was mentioned previously, this hypothesis was drawn from a paradigm defining goals as very specific behavioral intentions for a simple task, which participants anticipated having to carry out in the presence of the experimenter (Marsh et al., 1997; 1999). In contrast, the current study defines goals as broad overarching strategies to be employed in a complex but hypothetical task. Where specific behavioral intentions showed priming prior to completion and inhibition following completion, the broader goals did not show this effect. This contrast is most likely attributable to differential demands placed on attention by these two types of goals. Specific behavioral intentions place higher demand on short term memory recall (likely involving rehearsal) and information can be "released" once the simple task is completed. Broader goal strategies, on the other hand must be stored in long term memory in order to serve a comparator function during completion of a complex task that taxes working memory.

Finally, commitment was anticipated to enhance activation and inhibition effects (Hypothesis 4). Tests of this hypothesis revealed mixed results, but generally failed to support this assertion. One point of interest that arose from the tests of this model is that – in light of the fact that word category was by far the strongest predictor of RT – when words were congruent with the assigned goal, RTs were faster than words were related to the ignored goal. This evidence of activation, though mild (true activation is established as compared to control words), is encouraging. As this activation effect had not previously been established, but only emerged once goal commitment was accounted for, the relevance of goal commitment is validated. Further, these findings lead to the conclusion that, were this variable to be properly assessed (that is, measured before the task is completed rather than after) and were other limitations to be compensated for, commitment may indeed prove to have a strong impact on the attention mechanism in goal setting.

Results of exploratory analyses revealed that of the individual level variables modeled in this study, preference for one goal category over another (as measured by the 7-item Likert scale) and volatility influenced RT. Findings suggest that individuals with a preference for the individual orientation have respond to all words faster than individuals with a preference for the organizational orientation. This was a most unanticipated finding. It was expected that preference would lead to faster RTs, but only to words in the preferred category. Thus, had a preference for the organizational orientation led to faster RTs, results would not be surprising since organizational related words had faster overall RTs. As it stands, individual related words had slowest overall RTs and yet a preference for this category was significantly associated with faster reaction times. It might be the case that preferences for individual or organizational orientations are tapping into the constructs of individualism or collectivism tendencies, respectively. Both of these pairs of constructs balance the needs of the many against the needs of the few (or one). If this is the case, participants preferring the individual orientation might also be expected to have higher achievement motivation (Sagie, Elizur, & Yamauchi, 1996). In turn, high achievement motivation could be leading participants to more focused performance on the SCT and thus, faster RTs.

Volatility (vs. persistence) is representative of an individual's ability to persist with goal striving behaviors once they have started. It was anticipated that action-oriented individuals would have stronger activation and inhibition effects than state-oriented individuals. Results

indicated that as participants scored higher on the volatility/persistence dimension (indicating that a participant was more persistent than volatile) he/she had faster RTs. It was expected that more action-orientated (or specifically in this instance more persistent) participants would be better able to disengage from irrelevant information and persist in goal striving efforts; and this was further expected to moderate the strength of activation and inhibition effects. While the lack of remaining variance to be predicted at Level 1 prevented testing of this in reference to attentional effects, it is not unreasonable that more persistent individuals should be more task focused in general, less easily distracted during execution of the SCT, and therefore have generally faster RTs than individuals who are more volatile.

Limitations of Current Research

Dominance of organization words. There are three potential factors that could have led to the predominance of organizational words over the other two word categories: differences in degree of fit, the physical design of the SCT response, and sample issues.

The degree to which words fit or coincide with the categories in which they belong has direct bearing on the strength of accessibility of those words from long term memory (Fazio, 190). If one compares two words that belong to the same primed category – one with a strong category fit and the other with a weak category fit – the word with a stronger association to the category will be more readily accessible from long term memory and reflect a faster RT than the word with weak category fit. As such, the inability to locate words for each category that had equivalent levels of fit during pilot testing should have signaled the need for some alternate measure of attention. For example, a lexical decision task may have been advantageous over the semantic categorization task.

As reflected in Table 1, organizational words had a stronger category fit than individual words or creativity words. When pilot study participants were asked to place words in their proper categories, there were differences in the percentage of agreement among categories, with organizational words yielding 95% agreement, individual words yielding 88% agreement, and creativity words yielding 86% agreement. The more pertinent differences however, were in the percentage of raters who thought that the word (properly categorized) had high fit (4 or 5, on a 1-5 Likert scale). These were, 92% for creativity words, 82% for organizational words, and 67% for individual words. It is interesting to note, however, that individual words had higher averages of category fit than creativity words. If this were the only cause of the categorical differences, the

baseline RTs should have been consistently faster for individual words than for creativity words. The extent to which this was not found indicates that some other force is suppressing the individual category. As discussed earlier, two explanations might be salience of the task being related to the participants' management course or a characteristic of management students for organization related material to be globally primed.

The physical design of the SCT presents an additional explanation for the dominance of responding to organization words. SCT responses were keyed on a standard keyboard fitted with a template over the function keys to indicate each of the three categories. Keys used for responding were as follows: individual, F1-F4; creativity, F5-F8; organization, F9-F12. Participants were instructed to use index fingers to key creativity responses and the remaining fingers on either hand to key the other two categories. One of the dangers of using a two-handed response for a RT task of this nature is that outside of the manipulation, responses keyed with the dominant hand will show faster RTs than responses using the less dominant hand. As 91% of participants reported being right handed, it stands to reason that the majority of participants would show faster RTs to organization words. This could be corrected for by counterbalancing the order of the categories either between or within subjects.

As was noted by Meacham and Diefendorff (2001), psychology students had a tendency to reflect strong preferences for the fairness goal as compared to the productivity goal. This was partly attributed to the possibility that a pool of psychology students might generally represent more liberal and individual focused attitudes than other samples (i.e., business students). As this sample was comprised solely of management students, it may be the case, that as a group, they have a bias in favor of the organization or simply that the salience of participation in the experiment being directly related to their management course could have primed pro-organizational tendencies. Under these circumstances, the substantial differences in RTs to organizational related words as compared to the other categories are not surprising.

Measuring Commitment. In addition, a methodological flaw in task design limits the degree to which results can provide evidence for or against the hypothesized model. Specifically, the assessment of goal commitment was inadvertently placed in the improper order in the duration of a trial. Participants completed this measure at the end of each trial. This makes it impossible to infer a causal relationship of commitment on performance. In order to have done so, this measure should have been administered immediately after the goal was assigned. As

such, this scale does not represent a precise measure of goal commitment, per se. Under the circumstances, it is possible the actual act of completing the task interfered with participants' responses. For example, cognitive dissonance plays a role under assigned goal conditions. The behavior of employing an assigned goal could have unduly affected responses to the items. In particular, if an individual was only mildly committed to the goal when it was assigned, the act of developing a solution alone could induce attitude shift (increased commitment). Further, the presence of an incentive ($50 to the three participants with most effective responses) and the anticipation of being asked how reasonable his/her solution was could very likely have enhanced these effects. Thus, all findings regarding commitment are tenable; replication is required for implications to be sound.

Power. Further, the design of this experiment created an inherent imbalance of power between levels of the model. At Level 1, there were 20,298 observations of the dependent variable; 36 per trial, and 144 per person. It is only logical that even very small differences in such a huge sample size would be extremely significant. Further this explains the disproportionate location of 74% of the variance at Level 1. Comparatively, at Level 2 – explaining only 2% of the total variance – there were a total of 600 observations, with only 4 per person. Differences at the trial level would have had to of been extreme, in order to even approach the significance of comparatively small differences at Level 1. This could further explain the inability to find an interaction between word category and goal; making it impossible to uncover activation and inhibition effects. Finally, 150 participants is a substantial Level 3 sample size. Thus it is reasonable that 23% of total variance was explained by individual differences; though given the circumstances, differences at Level 3 would still have needed to be great in order to balance the overwhelming influence of Level 1 variables.

To counteract the imbalance of power between levels of the model, a reflexive response might simply be increasing the number of trials per person. However, given the time consuming nature of this research, it is unreasonable to ask participants to do more than 4 or 5 trials. An alternative would be to simply make fewer observations of the dependent variable at level one. Diefendorff et al, only use 5 (1997) or 6 words (1995) in each category, and repeat them 4 times throughout the experiment. While RT is likely to be influenced substantially by learning effects, it should simply equate to a constant reduction of RTs over the course of the study. Diefendorff et al.'s findings were nonetheless significant. The power added by the use of HLM rather than

ANOVA should be sufficient to counteract the negative effects of a smaller number of observations. This would allow for only the use of words that have high levels of agreement and category fit. Selection of a few (6 or 9) words of this nature for each category (as opposed to 24 words with adequate agreement and category fit) should improve likelihood of success.

As was noted in the introduction of this paper, findings in person perception literature suggest the tendency for non congruent information to be more dominant (Hastie & Kumar, 1979; Rojahn & Pettigrew, 1992). Due to the predominant influence of categorical differences, it is impossible to draw any conclusions to resolve the extent to which that effect is active in the current study. Were that the case, however, control words should have been responded to slowest at all times; as one would expect both goal-congruent words and goal-incongruent words would have a heightened state of activation. As it stands, results did not indicate this. Again, strength of category could have been the dominating factor; however, one would not have expected to find conflicting goal related information to be slower than goal related info (as was found in the final model) because both types of words would be expected to be equally activated.

Directions for future research

Despite the numerous limitations of this research, this study attempts to provide empirical support for the relatively uncorroborated claim that attention is one of the primary mechanisms at work in the goal/performance relationship. Only recently have a few lines of research emerged attempting to address this issue, (Moskowitz, 2002; Shah et al., 2002). To further substantiate the importance of attention in goal setting, the following recommendations are made for future research:

While a laboratory setting can sometimes impede upon the generalizability of research findings, the in-basket memo task used in this study is reflective of a complex work task that can be generalized to supervisory positions in almost any industry. Further, the goals defined in this study, while not necessarily specific, represent complex and difficult objectives that likewise must be balanced in many real world situations. In the absence of being able to use real world samples for this type of research, future empirical studies should expand upon and develop new frameworks wherein tasks and goals reflect more concern for realism. However, somewhere along the line, the present efforts to employ realistic goals in a meaningful task have lead to conceptual disconnect from traditional goal setting research.

This study was originally purposed to fill in a gap in the empirical support for attention as a goal setting mechanism. Even if hypotheses had been supported, this experiment is limited in the extent to which it can truly address the issue, given the nature of the assigned goals. Goal setting theory posits that specific and difficult goals positively impact performance. It could be argued that the goals employed in this study are qualitatively different from goals as defined by traditional goal setting research. Typically, the goals employed in goal setting research are quantitative and specific performance goals; whereas goals in the present study are more like general orientation goals or strategies. Further, the present paradigm does not manipulate goal difficulty or specificity. These fundamental differences in the nature of the goals in use here prevent any conclusions from being drawn about the mechanisms at work in the goal-performance relationship. Generally speaking, concern for the realism of the task and goals behooves the generalizability of any research. However, as long as this basic research is without strong foothold, pursuit of this specific research question requires this paradigm to be revisited in order to more closely reflect the parameters of traditional goal setting theory.

Further, the current study leaves out a vital element of goal setting: performance. As was seen in the hypothesized model (Figure 1), attention is thought to be one mechanism through which goals have an impact upon performance. While this research attempted to establish the relationship between goals and micro-level attentional processes; future studies should take the next step and seek to establish attention as a mediator of the goal/performance relationship.

Finally, looking at goals as a source of micro-level attentional processes from a hard and narrow goal setting perspective is perhaps somewhat limited. Recent consideration of goal-related attention in social cognitive literature has successfully employed priming paradigms as an antecedent to goal striving (Bargh et al., 2001; Shah & Kruglanski, 2002). Future research striving to establish attention as an outcome of goals would benefit from a broader perspective that attempts to integrate these two approaches.

Conclusions

The current study was an attempt to examine micro-level attentional processes (activation and inhibition) and the influence they have on goal setting in the context of an in-basket memo task. Drawing on exemplars from selective attention research, information related to an assigned goal (and an ignored, conflicting goal) was assessed for accessibility from long term memory relative to neutral information. The current paradigm failed to produce basic evidence of these

attentional mechanisms at work. However, when goal commitment was also taken into consideration, there is weak evidence to support that goals function through attention by making goal-related information more accessible from memory.

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Table 1

Word Properties by Category

Averages	Individual	Organizational	Creativity	Across Category
Agreement	.88	.95	.86	.90
% High Degree of fit (4 or 5)	67.15	82.89	92.00	80.19
Number of Letters	8.00	7.96	7.79	7.92
Number of Syllables	2.96	2.63	3.09	2.89

Table 2

Intercorrelations Between Person and Trial Level Variables

	N	*M*	*SD*	1	2	3	4	5	6	7	8	9	10	11	12	13
1. Preference	150	21.34	3.33	-												
2. SCT Preference				.06												
3. ASO Total	150	.60	.17	.14	-.03											
4. Preoccupation	150	.47	.25	.03	-.02	.77**										
5. Hesitation	150	.61	.24	.17*	-.03	.85**	.51**									
6. Volatility	150	.71	.18	.11	-.02	.55**	.06	.32**								
Commitment																
7. Trial 1	142	29.11	4.33	-.09	.13	.13	.15	.07	.04							
8. Trial 2	147	28.23	5.06	.10	.03	.13	.07	.11	.11	.12						
9. Trial 3	144	29.31	5.07	.06	.08	.13	.13	.13	.00	.37**	.10					
10. Trial 4	144	28.37	4.88	-.05	.00	.14	.15	.10	.05	.22*	.41**	.03				
Feasibility																
11. Trial 1	142	3.68	.91	.00	.17*	.17	.17*	.14	.03	.69**	.15	.31**	.07			
12. Trial 2	147	3.63	1.05	.12	-.02	.16*	.07	.15	.16	.04	.75**	.08	.29**	.17*		
13. Trial 3	144	3.84	.97	.09	.00	.07	.03	.06	.09	.35**	-.01	.79**	.02	.27**	.11	
14. Trial 4	144	3.56	1.02	-.05	-.04	.16	.19*	.07	.07	.20*	.34**	.04	.76**	.19*	.43**	.14

Note. SCT = semantic categorization task. ASO = action state orientation. * $p < .05$. ** $p < .01$.

Table 3

Comparing activation and inhibition effects between goal completion conditions

		Coefficient	SE	*t*	*df*	*P*
Across Goal Completion						
Intercept	Π_0	2.918025	0.006489	449.715	149	0.000
IndWord	Π_1	0.038281	0.002264	16.911	149	0.000
OrgWord	Π_2	-0.038605	0.002410	-16.021	149	0.000
Goal	B_{01}	-0.000227	0.002511	-0.090	149	0.928
Goal x IndWord	B_{11}	0.002349	0.002690	0.873	149	0.383
Goal x OrgWord	B_{21}	-0.000602	0.002607	-0.231	149	0.818
Pre Goal Completion						
Intercept	Π_0	2.924325	0.006738	434.006	149	0.000
IndWord	Π_1	0.037691	0.00327	11.526	149	0.000
OrgWord	Π_2	-0.037502	0.003226	-11.626	149	0.000
Goal	B_{01}	-0.002269	0.003192	-0.711	149	0.477
Goal x IndWord	B_{11}	0.001906	0.00396	0.481	149	0.630
Goal x OrgWord	B_{21}	-0.004075	0.003892	-1.047	149	0.296
Post Goal Completion						
Intercept	Π_0	2.911812	0.006631	439.131	149	0.000
IndWord	Π_1	0.038766	0.002497	15.523	149	0.000
OrgWord	Π_2	-0.039642	0.003005	-13.193	149	0.000
Goal	B_{01}	0.002034	0.003517	0.578	149	0.563
Goal x IndWord	B_{11}	0.003092	0.003549	0.871	149	0.384
Goal x OrgWord	B_{21}	0.002715	0.003739	0.726	149	0.468

Table 4

HLM Results of Final Model (Hypothesis 4)

		coefficient	SE	*T*	*df*	*P*
Intercept	Π_0	2.917737	0.006492	449.447	149	0.000
Goal	β_{01}	-0.001036	0.002806	-0.369	149	0.712
Commitment	β_{02}	-0.000123	0.000440	-0.279	149	0.780
IndWord	Π_1	0.014737	0.009404	1.567	149	0.117
Goal x IndWord	β_{11}	0.049031	0.018032	2.719	149	0.007
Commitment x IndWord	β_{12}	0.001239	0.000428	2.894	149	0.004
Goal x Commitment x IndWord	β_{13}	-0.001603	0.000609	-2.630	149	0.009
OrgWord	Π_2	-0.028931	0.009428	-3.069	149	0.003
Goal x OrgWord	β_{21}	-0.020226	0.018166	-1.113	149	0.266
Commitment x OrgWord	β_{22}	-0.000043	0.000451	-0.094	149	0.925
Goal x Commitment x OrgWord	β_{23}	0.000697	0.000611	1.140	149	0.255

Table 5

Residual Components for Final Model with Random and Fixed Effects

			Variance Component	χ^2	*df*	*p*
Random Effects Model		SE	σ^2			
		0.00018	0.01741			
Levels 1 & 2		SD	τ (π)			
Intercept	R0	0.02303	0.00053	617.6358	126	0.00
IndWord	R1	0.00243	0.00001	Too few df to compute		
OrgWord	R2	0.00296	0.00001	Too few df to compute		
	E	0.1319	0.01740			
Level 3		SD	τ (β)			
Intercept	U00	0.07581	0.00575	810.25157	117	0.000
Goal	U01	0.01221	0.00015	129.14474	117	0.209
Commitment	U02	0.00242	0.00001	166.4725	117	0.002
IndWord	U10	0.03860	0.00149	96.55887	117	>.500
Goal x IndWord	U11	0.05417	0.00293	94.17456	117	>.500
Commitment x IndWord	U12	0.00166	0	114.86555	117	>.500
Goal x Commitment x IndWord	U13	0.00179	0	93.0204	117	>.500
OrgWord	U20	0.04138	0.00171	107.14972	117	>.500
Goal x OrgWord	U21	0.06184	0.00382	103.57837	117	>.500
Commitment x OrgWord	U22	0.00122	0	96.63346	117	>.500
Goal x Commitment x OrgWord	U23	0.00202	0	104.42926	117	>.500
Fixed Effects Model		SE	σ^2			
		0.00018	0.01745			
Levels 1 & 2		SD	τ (π)			
Intercept	R0	0.02426	0.00059	625.09802	275	0.000
IndWord	R1	0.0149	0.00022	695.13054	274	0.000
OrgWord	R2	0.01802	0.00032	759.54464	274	0.000
	E	0.1321	0.01745			
Level 3		SD	τ (β)			
Intercept	U00	0.07656	0.00586	1967.2707	148	0.000
Commitment	U02	0.00181	0	167.27514	148	0.133
Commitment x IndWord	U12	0.00157	0	205.81187	148	0.001
Goal x Commitment x IndWord	U13	0.00026	0	182.79079	148	0.027
Commitment x OrgWord	U22	0.00124	0	168.69686	148	0.117
Goal x Commitment x OrgWord	U23	0.00015	0	127.6001	148	>.500

Figure 1. The attention mechanism in the goal-performance relationship

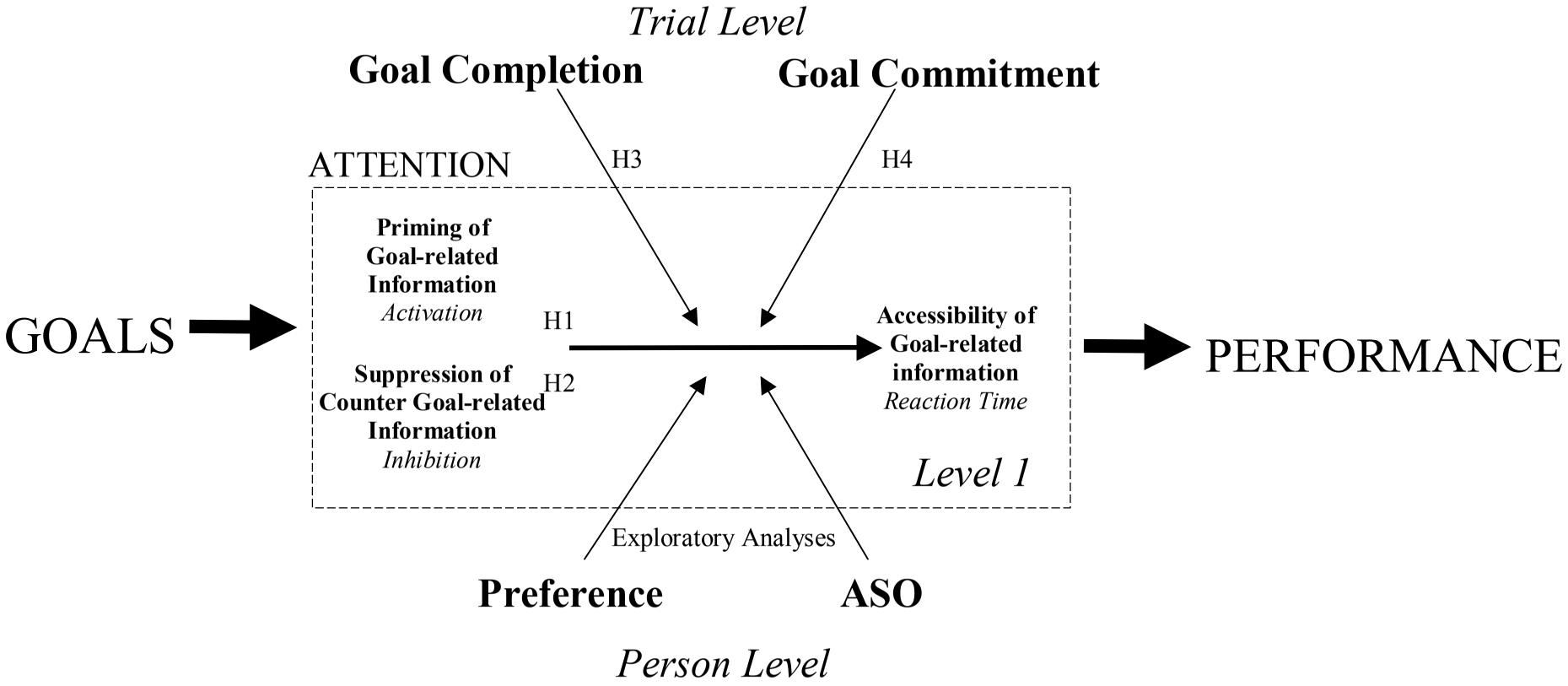


Figure 2. Mean RT (ms) as a function of goal and word category

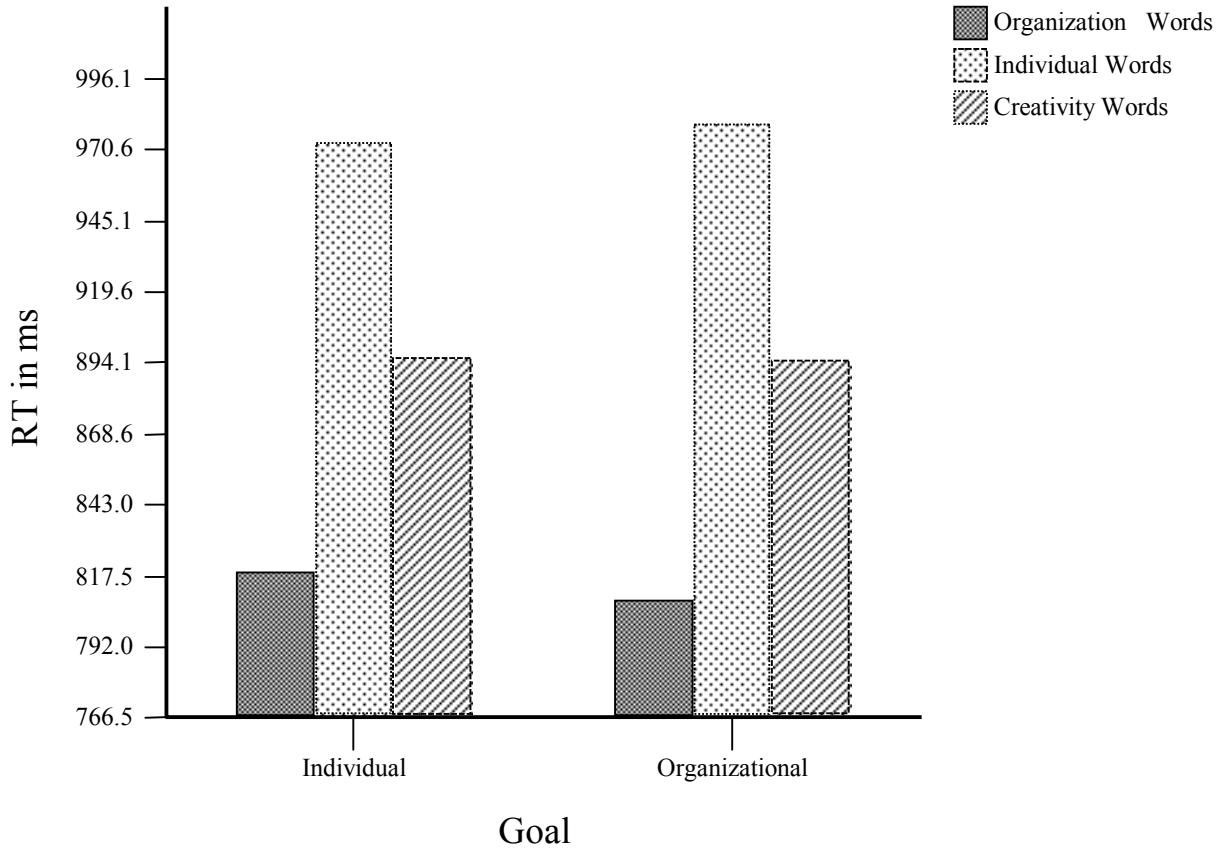


Figure 3a. Predicting RT with Commitment, Goal, and Word Category (OWord)

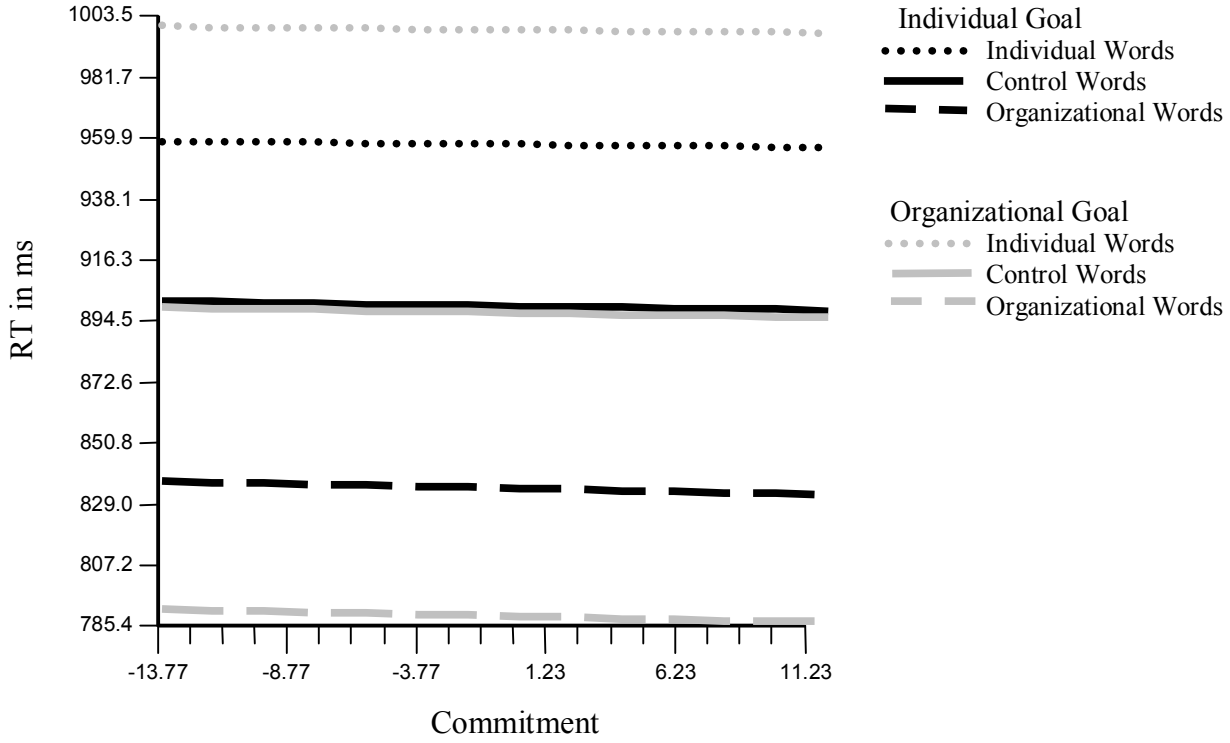


Figure 3b. Predicting RT with Commitment, Goal, and Word Category (IWord)

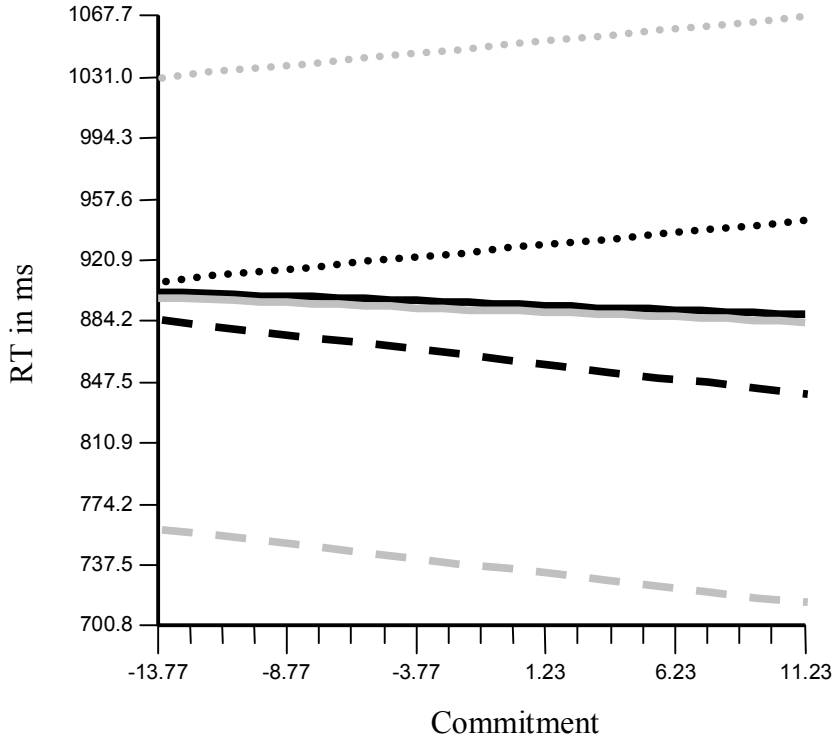


Figure 4. Plotting Feasibility of Solution vs. Intercept residuals

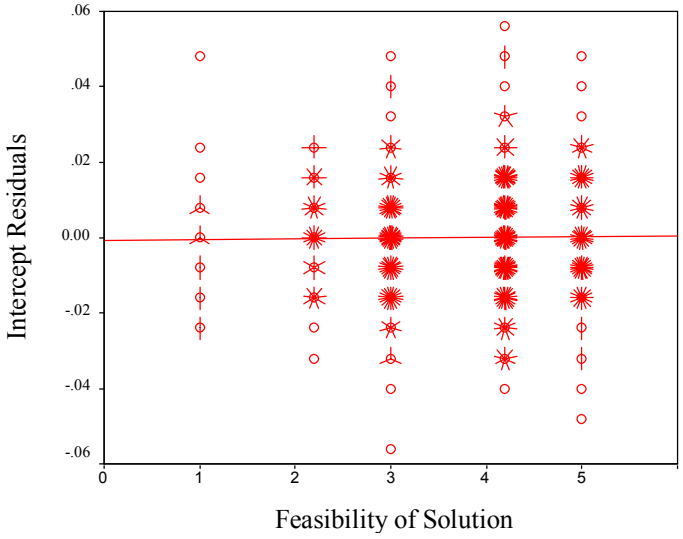


Figure 5. Plotting SCT Preference vs. Intercept and Slope Residuals

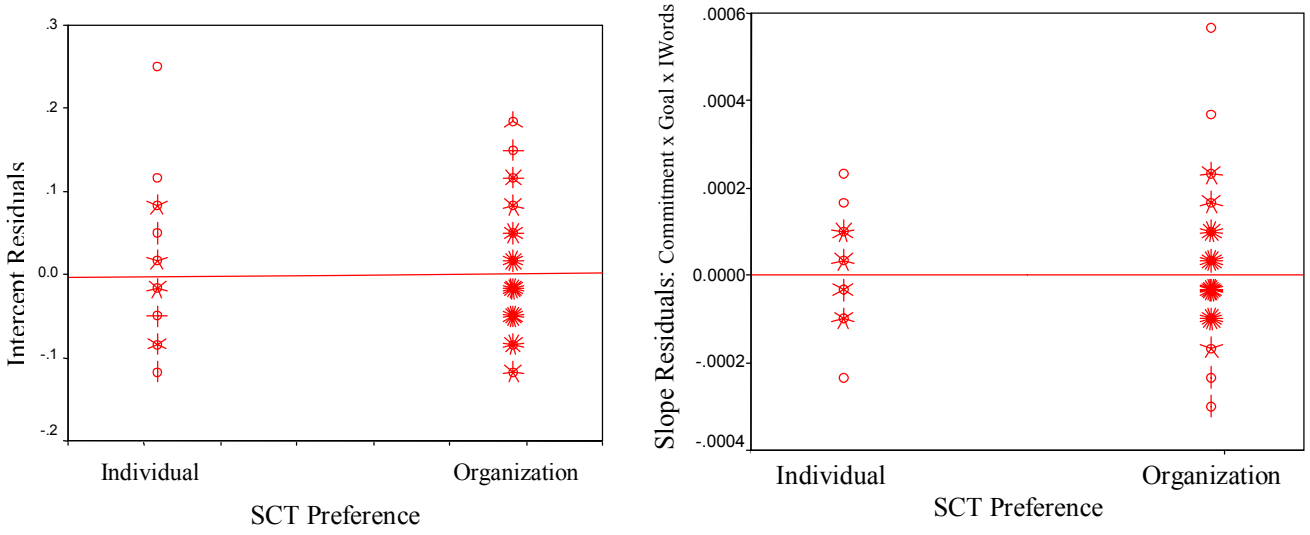
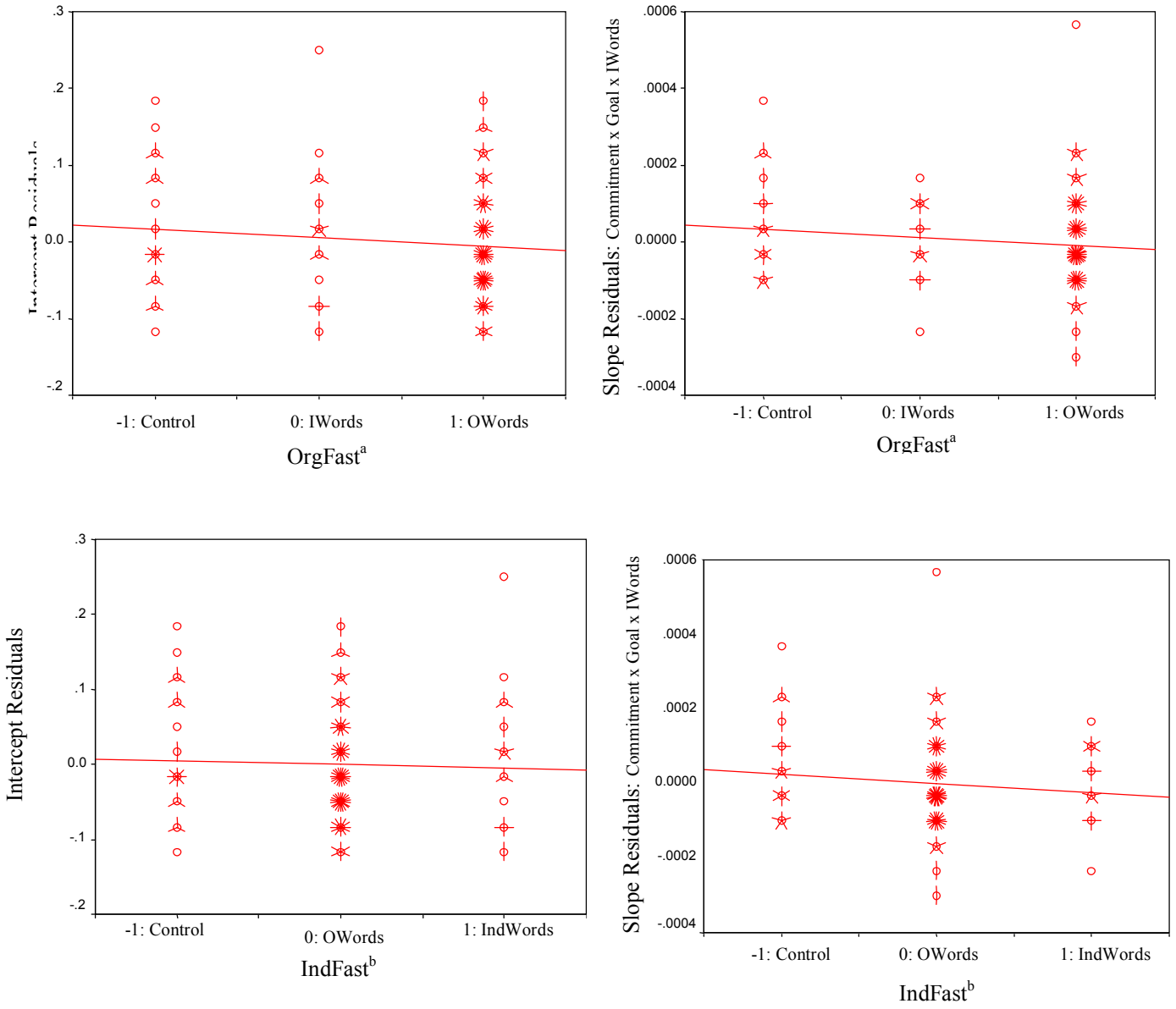


Figure 6. Plotting Fastest SCT Response vs. Intercept and Slope Residuals



Note. Predisposition to respond fastest to one word category faster than another in the baseline SCT was effect coded as two variables: OrgFast[a] (1 = organizational words were fastest; 0 = individual words were fastest; -1 = control words were fastest) and IndFast[b] (1 = individual words were fastest; 0 = organizational words were fastest; -1 = control words were fastest).

Figure7. Preference vs. Intercept and Slope Residuals

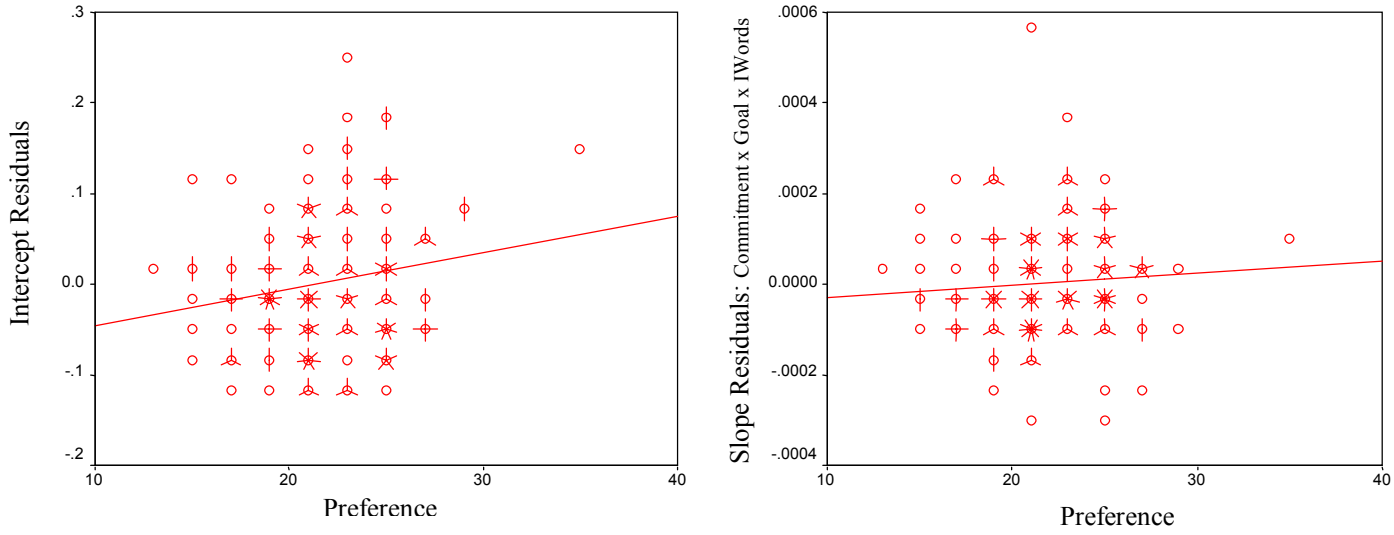


Figure 8. The Main Effect of Preference on RT

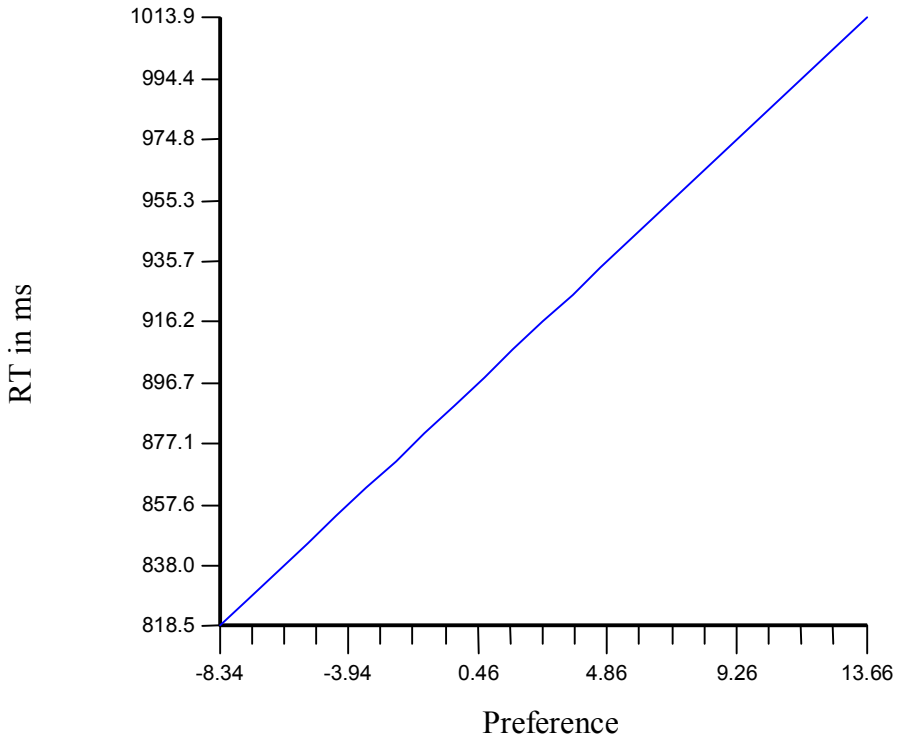
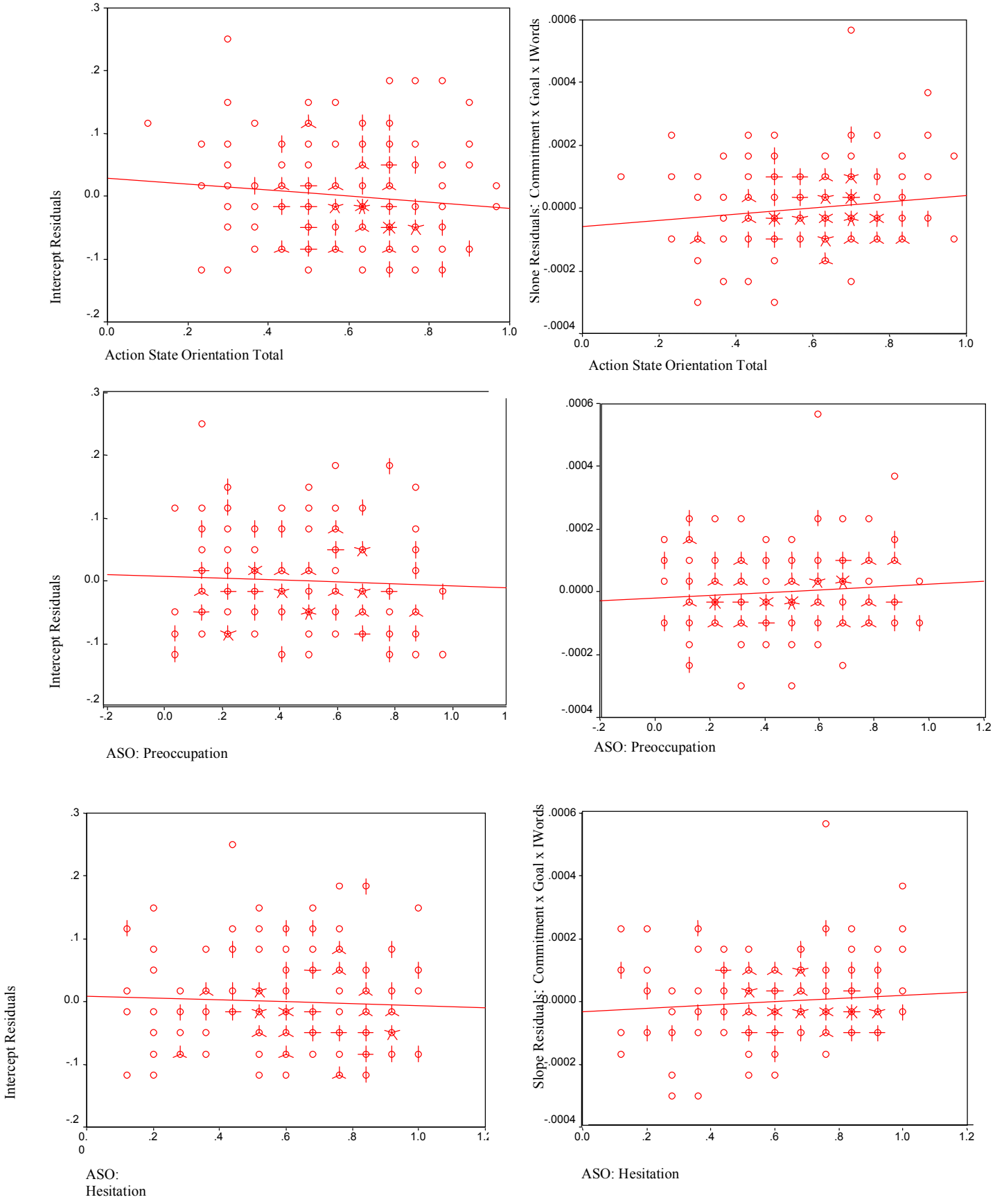


Figure 9. Action State Orientation (and subscales) vs. Intercept and Slope Residuals



(Figure 9 Continued)

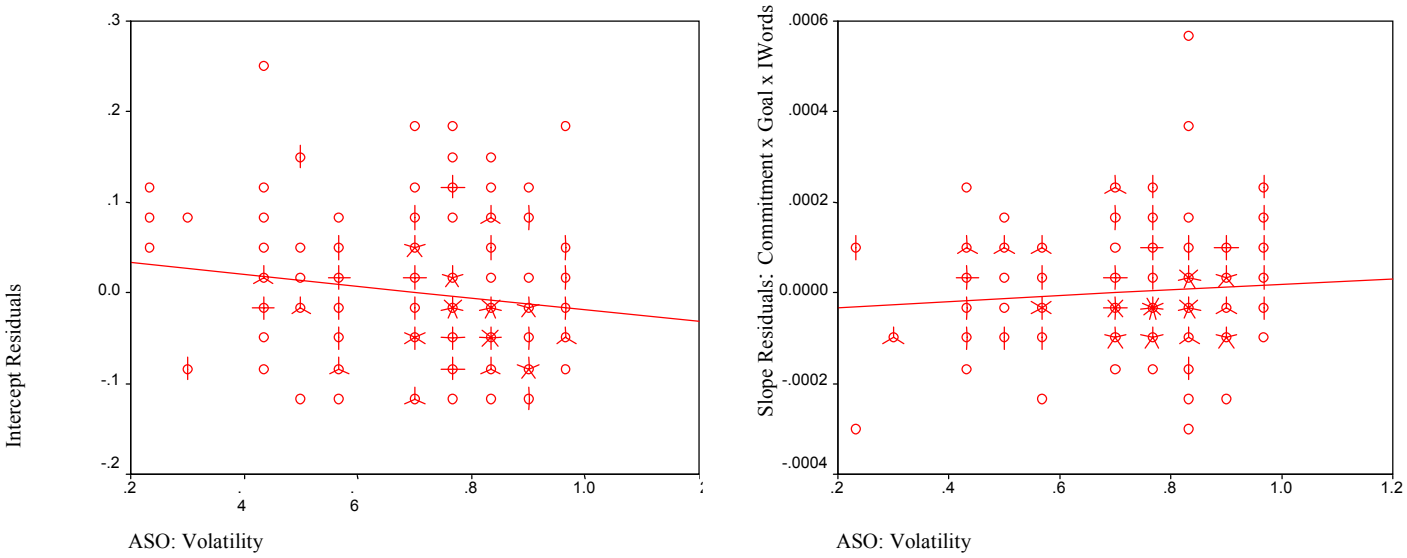
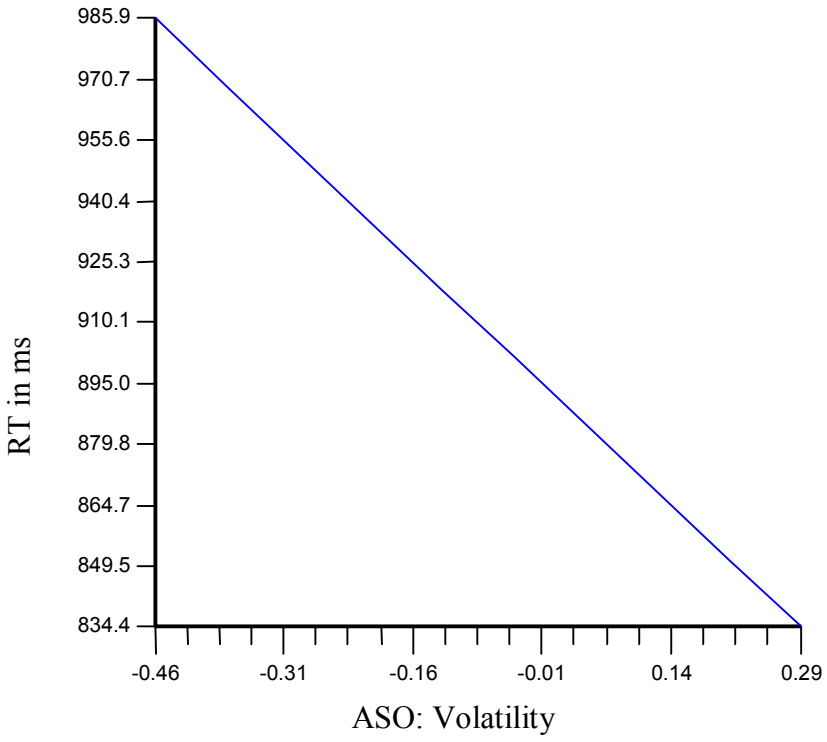


Figure 10. The Main Effect of Volatility on RT



Appendix A: Memos

Sample Memo

To: Chris Green, Human Resources
From: Cal Martin, Security
Subject: Theft from the loading docks

I have just finished the quarterly report for the shipping department and I'm disturbed to see that there has been an alarming increase in theft. Past studies show that 65% of these thefts are due to employees, and 35% to outsiders. Although I have no solid proof, the paper trail seems to point to the northwest loading dock. Now, I have interviewed the employee who is responsible for that area, Allen Kimball. He's been with the company for 4 years and has had average performance reviews. He seemed genuinely surprised by my questioning, and honestly, he just doesn't seem the type. It's a high enough trafficked area that it could be just about anyone. Unfortunately, Kimball is ultimately responsible. This high rate of theft calls for immediate dismissal. Do you have any recommendations as to how we should proceed?

Memo A

To: Chris Green, Human Resources
From: Nicky Harper, Cutting Room Supervisor
Subject: Overtime for Jonathan Stohlman

I have a concern about a situation that has developed with one of my operators, Jonathan Stohlman. He has requested overtime on a number of occasions but I have been unable to give him any, especially since management limits the amount of overtime we can grant. Following the typical trend of new hires, some of our newer operators have been getting overtime regularly simply because they are still learning and need more time to meet their quotas and fix mistakes. Jonathan has complained, saying that he is getting punished for working fast and efficiently while others are being rewarded for making mistakes and working slow. I explained to him the reasons why he can't work overtime, but he still seems upset and his frustration is mounting. In light of all this, I find it very awkward to keep telling him no. Do you have any recommendations?

Memo B

To: Chris Green, Human Resources
From: Rod Ferner, Sales Manager
Subject: Performance Reviews

I've just finished my quarterly reviews of all my employees. Spencer Reiley, who in the past was one of my best employees, has been rated unsatisfactory the past two quarters. I've tried to talk to him about his poor performance, but he just clams up. I hate to fire him, but his job is an important one and its critical that it be done well. I think these changes may be because of some family problems he's been having lately. I've heard from his coworkers that his wife has been fooling around on him. Steve Brown, one of his closer pals, says he is really torn up about all of this and thinks he might be depressed. Although termination is the standard for ratings this low, I'm not sure if firing him is the right thing to do. Do you have any other suggestions?

Memo C
To: Chris Green, Human Resources
From: Tonya Dickson, Accounting Manager
Subject: Intern vs. Temp pay differences

Kelly Thomas was selected for an internship in the accounting department a few months ago. Most of the time that she has been working with us she has been doing endless data entry for the fiscal year inventory. Last week the head accountant panicked and hired a temp to help with the last minute entry. Kelly spent half a day explaining to her what we were doing and how to help finish the data entry. In talking to one another, Kelly found out that the temp is being paid nearly double her rate to do the same job. Now Kelly understands that the temp is paid through the temp agency and not our company, but she is really disgruntled, given that she has more knowledge, skills, and experience than the temp. Kelly is a very talented young lady, and she's been a big help in the department. I'd hate to see us lose her over this. What do you think we should do?

Memo D
To: Chris Green, Human Resources
From: George Barros, Loading Dock Supervisor
Subject: Work slow down

We recently hired 3 part-time employees to help in the late afternoons with the outgoing orders. One of the new employees is an athletic young student who said she wanted the job for the good pay and exercise. She works hard, has a good attitude, shows up on time, and follows directions well. She honestly seems to enjoy the work. Unfortunately, I have noticed that work has slowed down back here. When the guys aren't following her every move, they're literally falling over themselves to help her with her work. She doesn't seem to mind, and no one is being at all harassing, but it is quite obvious that she is a distraction and our trucks aren't being loaded as fast as they ought to be. Do you have any suggestions?

Appendix B: Words

Individual	Organization	Creativity
kind	team	idea
honor	costs	artsy
loyal	rules	artful
person	profit	invent
virtue	bylaws	poetic
respect	budget	create
concern	policy	painter
honesty	network	musical
loyalty	finance	fantasy
decency	economy	unusual
ability	business	abstract
faithful	commerce	colorful
patience	planning	artistic
sympathy	assembly	creative
generous	industry	musician
courteous	corporate	original
gratitude	guidelines	inventive
integrity	department	invention
compassion	management	visualize
individual	production	visionary
trustworthy	economical	theatrical
sensitivity	corporation	innovative
appreciated	manufacture	abstraction
satisfaction	bureaucracy	imaginative

Appendix C: Commitment Scale

Respond to the following on a 5-point Likert scale of agreement:

1. I am strongly committed to pursuing this goal strategy.
2. I put forth effort beyond what I'd normally do to employ this strategy.
3. Quite frankly, I don't care if I successfully solved this problem or not.
4. There is not much to be gained by using this strategy to address this problem.
5. It is quite likely that this strategy may need to be revised, depending on how things go.
6. It wouldn't take much to make me abandon this strategy.
7. It's unrealistic for me to expect to successfully employ this strategy.
8. I think this goal is a good strategy to use for this problem.

Appendix D: Preference Scale

Respond to the following on a 5-Likert scale of agreement:

1. When making decisions about employees, it is more important to consider the individual's personal situation than strictly following broad, blanket policies.

2. In general, when resolving a dispute, I would rather side with the organization over an individual employee.

3. In a work environment, priority should be given to meeting production demands over keeping workers happy and comfortable.

4. If I had to choose, the outcomes of my decisions would generally favor the individual employee over the company's objectives.

5. When at work, meeting production goals of the company takes precedence over meeting individual needs.

6. When at work, meeting individual needs is more important than sticking to the rules of the organization.

7. When in a leadership position, it is best to make decisions about people on a case by case basis.

8. When making decisions about people it is best to apply the same rules and policies to everyone, regardless of individual circumstances.

9. The needs of individual workers should not interfere with achieving organizational goals.

10. In general, when resolving a dispute, I would rather side with the individual employee over an organization.

K R I S T I N A A . M E A C H A M

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EDUCATION

Aug 2001 – May 2004 **Virginia Tech; Blacksburg, VA**
M.S. Industrial/Organizational Psychology
- Thesis: The Role of Attention in Goal Setting
- Advisor: Dr. John J. Donovan

Aug 1997 – May 2001 **Louisiana State University; Baton Rouge, LA**
B.S. Psychology
- GPA 3.77; graduated with College Honors
- Senior Honor's Thesis: Goals as a source of activation and inhibition
- Advisor: Dr. James M. Diefendorff

EMPLOYMENT EXPERIENCE

Aug 2001 – Present **Department of Psychology, Virginia Tech**
Graduate Teaching Assistant
- Social Psychology Lab Instructor: Developed syllabus, course materials, and assignments. Provide hands on experience in development, execution, statistical analyses, and writing of a research paper for an experiment in the field of Social Psychology.
- Psychology of Measurement Lab Instructor: Developed syllabus, course materials, and assignments. Provide hands on experience with statistical analyses using SPSS software.
- Introduction to Psychology Recitation Instructor: Responsible for 2-3 groups of approximately 35 students. Assist students in acquiring a broad understanding of the field of psychology; expand upon material covered in students' lecture portion of the course

Aug 2003 **Executive Decisions International, LLC**
Independent Contractor
- Added to and updated recommendations for performance improvement, contributing to the *Development Recommendations Book* available to EDI clients.

May 2002 – Dec 2003 **Chateau Morrisette Winery**
Tasting Room Retail Sales
- Give in-depth tours, including history of CMW, and general wine production
- Conduct tastings of CMW wines, discuss each wine's unique characteristics
- Maintain up-to-date working knowledge of CMW wines, processes, general wine info, etc.

- Clerical duties, general customer service, cashiering, etc.
- TIPS training

Jan 2000 – Jul 2001 **National Headquarters of**
Student Intern **The Honor Society of Phi Kappa Phi**

- Wrote a comprehensive manual of organizational policy and procedure
- Wrote employee handbook for national headquarters staff
- Assisted in editing *A History of Phi Kappa Phi*
- Various other clerical duties

Aug 1998 – May 2001 **Department of Residential Life, LSU**
Resident Assistant (RA)/Senior Resident Assistant (SRA)

- Developed programming for residents to support them in academic endeavors, engage in activities within the community, instill personal responsibility, and promote emotional well being
- Served as a peer counselor, information source, and maintainer of the peace
- As an SRA, managed a staff of 8 RA's and 12 front desk assistants, including payroll, scheduling, supervision, etc.

SKILLS

	Skill Level	Last Used	Experience
Microsoft Office	Expert	Currently Used	7 years
SPSS	Expert	Currently Used	4 years
HLM	Intermediate	Currently Used	4 months
Typing	(65 WPM)	Currently Used	15 years
Data Entry	Expert	2 years ago	6 years
Public Speaking	Expert	Currently Used	9 years
Technical Writing	Intermediate	Currently Used	4 years
Teaching	Intermediate	Currently Used	3 years

AFFILIATIONS

Society of Human Resource Management *Student Affiliate*
Society of Industrial Organizational Psychology *Student Affiliate*
Blacksburg Master Chorale *VP of Membership*

GRADUATE COURSES

Psychology: Research Methods, Industrial Psychology (job analysis, selection, training, performance appraisals), Organizational Psychology I (Work Motivation), Organizational Psychology II (Leadership), Personality Processes, Proseminar in Learning, Social Psychology, Work Teams in Organizations

Quatitative: Statistics for Behavioral Sciences I & II, Psychometrics, Multiple Regression, Multi-level Modeling (HLM & WABA)