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COGNITIVE ORIGIN OF REPORTED GOALS

A Masters Thesis

Presented to

The Graduate College of

Missouri State University

In Partial Fulfillment

Of the Requirements for the Degree

Master of Science, Psychology

By

N. Monroe Pate

May 2017

COGNITIVE ORIGIN OF REPORTED GOALS

Psychology

Missouri State University, May 2017

Master of Science

N. Monroe Pate

ABSTRACT

Goal setting theory assumes that goals that drive self-regulation exist in 'goal structures' and that asking participants to report their goals draws from these pre-existing structures. This study tested this assumption of pre-existing goals against the notion that goals are generated by goal-setters at the time they are requested to report their goals. A model of working memory was used to differentiate between goals existing in memory or goals generated on the spot. Participants were 211 students from a large Midwestern public university, randomly assigned to one of two groups. The experimental group participants reported their career goals while also performing a working memory distraction task, while those in the control group reported their goals undistracted. Students in both groups shortly re-reported their goals (undistracted) by constructing a career 'goal structure.' The proportion of goals matching between reporting times, over total goals reported, could be used to infer whether goals were generated on demand or were drawn from pre-existing structures. After appropriate controls, the distracted group reported a significantly lower ratio of matching goals. No significant interaction effects were found for the secondary hypotheses that goal commitment and specificity were relevant to goal reporting. These results provide evidence that reported goals are not solely extracted from pre-existing mental structures.

KEYWORDS: goal setting, goal hierarchies, goal reporting, memory, self-regulation, goal specificity, goal commitment, working memory

This abstract is approved as to form and content

_____
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Chairperson, Advisory Committee
Missouri State University

COGNITIVE ORIGIN OF REPORTED GOALS

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Approved:

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INTRODUCTION

Goals that drive self-regulation are supposed to be naturally occurring. In accordance with Bandura's (1997) social-cognitive theory, it is assumed that participants report goals based upon pre-existing mental structures. Within goal-setting and self-regulation studies, participants are often asked to report these goals. However, it is not actually known if the participants held these goals in long-term memory prior to reporting, or if they were generated on the spot (Kane, Baltes, & Moss, 2001). Goal-based performance interventions might be informed by the extent to which goals are constructed when reported, or when pre-existing.

This difference has important implications for future goal-setting research methods and theory, and calls for such research have been made by goal theorists (e.g., Locke & Latham, 2006; Penningroth & Scott, 2013). It is possible that the question as to whether goals are constructed on demand, or exist in pre-existing structures, may vary across goal-setters and settings; in which case, it is important to investigate potential moderators of goal construction. Hence, a major focus of this study is to examine how self-regulative goals are reported and the extent to which they are extracted from long-term memory versus constructed at the time of reporting.

SELF-REGULATION MODEL

Self-regulation is an ongoing process in which thoughts and behaviors are altered in pursuit of meaningful goals (Kane, Baltes, & Moss, 2001; Kane, Marks, Zaccaro, & Blair, 1996). Motivation theorists have argued that performers' goals anchor and sustain self-regulation processes. From that perspective, researchers have studied and identified factors associated with goal pursuits over time (for review, see Locke & Latham, 1990). Three primary components that influence performance in a goal-based self-regulation model are goal content (i.e., difficulty and specificity), self-efficacy, and feedback (Locke & Latham, 2002).

Within the self-regulatory process, goals are not affective without feedback, and feedback cannot be interpreted without goals (Locke & Latham, 1990). By gathering feedback, performers acquire information relevant to make judgments about their ability on a task (i.e., self-efficacy), which in turn influences the level of goals set (Locke & Latham, 2002). Theoretically, the goals that individuals possess then influence effort, persistence, and the search for task strategies. Furthermore, these goals help to frame individuals' self-evaluations and reactions to subsequent performance feedback (Earley & Lituchy, 1991). Goals that drive self-regulation, or task goals, are often in service to higher level goals (Masuda, Kane, Shoptaugh, & Minor, 2010). Hence, goals are thought to exist in hierarchal structures in which higher level (i.e. distal) goals provide meaning and context to lower level (i.e. proximal) goals and those proximal goals provide immediate motivation to action and accomplishment towards distal goals (Bandura, 1997; Masuda, Kane, Shoptaugh, & Minor, 2010)

Goal Setting

"Goals have both an internal and an external aspect. Internally, they are ideas (desired ends); externally, they refer to the object or condition sought (e.g., a job, a sale, a certain performance level). The idea guides action to attain the object" (Locke, 1996, p. 118). Goals have multiple effects in the self-regulation process. When individuals are committed to specific, challenging, and obtainable goals, then positive performance has tended to result (Locke & Latham, 2006). Goals are theorized to affect performance because goals serve to focus attention, increase and sustain effort, and stimulate the search for task strategies (Locke & Latham, 2002). In addition, the rate and extent of goal achievement serves as feedback (Bandura, 1997).

Goals can come from several sources. They can be assigned by others, created through participation involving the self and others, or self-set (Latham & Marshall, 1982; Locke & Latham, 2006). The source of goal setting affects commitment; involving the goal setter in setting their own goals tends to result in greater goal commitment (Locke & Latham, 2002). The difficulty of self-set goals is shaped by the performer's prior performance and self-efficacy (Bandura & Locke, 2003). This information allows an individual to create a discrepancy between their current state and their desired future state. Locke and Latham (1990) proposed a discrepancy production process in which individuals set goals at a level above current performance and then self-motivate to achieve the goals.

Self-Efficacy

Within the self-regulation model, self-efficacy is the perception of one's own performance ability and likely outcomes on tasks relevant to goal obtainment (Bandura, 1997). Perceived goal difficulty and obtainability are a function of self-efficacy. Higher self-efficacy leads to outcomes such as setting more difficult goals, being more committed to goals, and feedback seeking and acceptance (Bandura, 1997; Locke & Latham, 2002). Individuals anticipate future satisfaction based upon obtaining their goals (Bandura, 1997). Anticipatory motivators include an increase in self-efficacy upon completion of a difficult goal, increased sense of control, and the opportunity to set future, more challenging goals that would potentially lead to higher satisfaction (Bandura, 1997).

In general, four sources of self-efficacy are past performance, modeling, persuasion, and affective interpretation (Bandura, 1997). The most potent sources are past performance and persuasion. Past performance, also known as enactive mastery experience, is key in developing self-regulation abilities (Bandura, 1997). Self-efficacy can be based on whether a performer's attributions produce feelings of control over their own performance (Bandura, 1997; Gist, Stevens, & Bavetta, 1991). Persuasion, particularly in the form of assigned goals, can affect self-efficacy by providing individuals evidence and explanation of what others expect from the self-regulator's abilities and future performance (Earley & Lituchy, 1991). In the same way, persuasion is a form of feedback (Bandura, 1997).

Feedback

"Feedback is the information people receive about their performance" (London, 1997, p. 11). Feedback can be constructive or destructive, and feedback is evaluated by the performer, then accepted, rejected, or ignored (London, 1997). In London (1997), the author provides thirteen positive impacts of constructive feedback. Those relevant to the goal-setting process, the self-regulative impacts, would be directing behavior to remain goal-directed, influencing future performance goals, increasing motivation through clarifying behavior-success contingencies, and improving self-efficacy.

Feedback can come from the environment, when individuals compare their goals against environmental information, or it can come from specific other individuals such as a boss, coworker, friend, or other (London, 1997). The person who gives the feedback influences perception of that feedback based upon delivery. One's perception of feedback depends upon who gives that feedback and how they give it (London, 1997).

Goal Hierarchies

It is important to understand the hierarchical structure of goals to fully understand the self-regulation model. Proximal goals and distal goals, conceptualized as goal proximity, is the concept that goals are categorized by how far in the future they are planned, relative to other goals (Masuda, Kane, Shoptaugh, & Minor, 2010). The temporal arrangement of goals is broadly divided into three categories of peak, distal, and task. Peak goals are the ultimate and most long-term outcomes desired within a goal domain. Task goals drive self-regulation, to be accomplished through immediate behavior meant to maintain self-regulation. Finally, distal goals are the connecting goals meant to

provide progress towards peak goals, or other distal goals (Masuda, Kane, Shoptaugh, &

Minor, 2010). As such, there can also be sets of distal goals, and those distal goals are

arranged in a hierarchy. Therefore, goal setters move towards distal goals by

accomplishing task goals.

GOAL REPORTING

To understand the self-regulation research and methodology, it is important to understand how and when goals are cognitively constructed. Specifically, whether asking people to report their goals may cause reports of goals that weren't previously influencing the self-regulative process. Despite the importance of this knowledge, very little research has been done to maximize "real" goal reporting, or determine what is and is not a "real" goal. Self-set goal research has commonly employed methodology that required participants to set their desired level of obtainment (Kane, Baltes, & Moss, 2001). Those who assigned the goal defined the domain, whereas the participants decide the difficulty within that domain. As participants do not set the goal domain, the goals that result from this methodology may not reflect the types of goals that exist naturally in goal structures that drive self-regulation (Kane, Baltes, & Moss, 2001). One proposed solution has been the introduction of free-set goals, in which participants are asked to report goals in broader domains such as physical performance or academic achievement. As participants are allowed to express their goals, they have more control to define goal content as well as goal level (Kane, Baltes, & Moss, 2001). Kane et al. (2001) argued this methodology allows for the reporting of goals that are more representative of goals in the self-regulation model. This methodology also has the advantage of allowing people to report multiple and important goals, from which inferences can be made about their goal structures (Masuda, Kane, Shoptaugh, & Minor, 2010). Requests can be made for an individual's entire goal structure related to some peak goal, and goals can vary in their quantity, quality, and level of specificity.

While it is less likely for free-set goal reporting to result in the reporting of goals the participant does not actually hold, the possibility still cannot be ruled out (Kane, Baltes, & Moss, 2001). Construction of goals at the time of reporting, based on experimenter demands, remains an unsolved problem in the goal-setting literature. The question of whether goals existed before reporting can be reframed as a question of memory. The extent to which these goals exist prior to reporting is equivalent to the extent to which they are stored in long-term memory. To better understand this and how a memory model can help resolve the question, it is necessary to understand the relevant memory functions.

Memory Model

Memory researchers have claimed that memory exists as a dual-store system in which distinction is made between long-term and short-term memory (e.g. Atkinson & Shiffrin, 1968; Raaijmakers & Shiffrin, 1981). Both systems are responsible for storing information, but information in short-term memory has the unique qualities of limited capacity and limited duration, while information in long-term memory must be retrieved and transferred to short-term memory to be used (Raaijmakers & Shiffrin, 1981). It has been further proposed that an additional process, working memory, is uniquely responsible for the storage and manipulation of short-term complex information (Daneman & Carpenter, 1980). Information to be used is retrieved from long-term memory into short term memory, where working memory can then manipulate that information (Baddeley & Hitch, 1974). Any new information needed for long term

storage (i.e. longer than a few minutes) must be committed to long-term memory from short-term memory, using working memory processes (Baddeley & Hitch, 1974).

Similar to capacity in short term memory, information storage in working memory is limited. Working memory can be overtaxed through competing information (Daneman & Carpenter, 1980). The limited capacity of short-term and working memory is thought to be approximately seven plus or minus two items, though each item can be a collection, i.e. chunk, of up to approximately seven items (Cowen, Chen, & Rouder, 2004). There are two ways to degrade working memory over time, which would be withholding active attention, or with interference (Baddeley & Hitch, 1974). Two components of working memory are thought to be responsible for short-term storage and manipulation; these are the phonological loop and visuospatial sketchpad, which store verbal and spatial information, respectively (Baddeley & Hitch, 1974). Overtaxing one does not significantly interfere with the other (Baddeley & Hitch, 1974). However, mixing both types of distraction shows a greater interference than individual interferences (Hazeltine, Ruthruff, & Remington, 2006).

Goal Setting in Memory

If a goal hierarchy existed prior to reporting, then it was likely stored in long-term memory and retrieved. By contrast, a goal hierarchy constructed when reported, in part or full, would need to use working memory processes to store and recall those goals later.

Working memory can draw from long-term memory, or multiple other locations. Working memory may provide insight into the extent to which reported goals existed in concrete structures stored in long-term memory. Due to limitations in working memory,

dual-tasks are designed to fill working memory and distract from existing information (Hazeltine & Wifall, 2011). Goals are likely to be a verbal structure controlled by the phonological loop, such that a proper distraction task for goals would be one which, at minimum, overtaxes the phonological loop. This is important, as distracting working memory is critical to resolving the extent to which reporting prompts goal construction.

By interfering with the ability to store and attend to goals in working memory, time of goal construction can be determined. This determination can be made by comparing goal hierarchies for the same free-set peak goal between two reporting periods, in which the first period involves distracting the participants' working memory. Inabilities to reproduce goals could be because the goal deletion was due to overtaxing working memory during storage. However, the lower rate of goal consistency could also be due to failure in long-term memory retrieval. The rate of matching goals between the two reporting periods, factoring out the ability of the distraction to suppress working memory's long-term goal retrieval, would provide evidence as to the time of goal construction. This is because the distraction is expected to reduce goals reported at time 1, which in turn has potential to reduce the number of goals available to match at time 2.

There exist potential factors which may moderate one's ability to reproduce goals when distracted. One such factor is goal commitment. Another factor is goal specificity. A peak goal that is more specific and to which an individual commits to more fully may indicate a peak goal which was thought about more fully. Thus, there would likely be more goals in the hierarchy to be recalled without resorting to new construction.

Hypotheses

In this study, participants will report goal structures in conditions where they are or are not distracted. They will then later be asked to report the same goal structure while not distracted. If construction occurs at the time that goal-setters are asked to report their goals, then interfering with working memory will interfere with the storage function of working memory; therefore, the later reproduction of goal content should contain a lower ratio of goals that match between production times. If goal structures exist prior to the request of goal reports, then interfering with working memory will interfere with recall of goal content at that time, but later reproduction should contain a greater ratio of goals first reported, and possibly additional goals. Overall, the ratio of goals that match over all goals reported, controlling for the ability of the distraction manipulation to prevent long-term recall, should inform the extent to which the time goals are constructed.

H1: Distracting participants while they report goals will lead to a lower ratio of goals that persist in their goal structure to a later time when compared to non-distracted participants.

It is likely that commitment will be a relevant influence for time of goal construction, if time of goal construction varies. This is because commitment implies thought given to the peak goal and participants are unlikely to be highly committed to peak goals which are not well-rehearsed. See figure 1.

H2: Peak goal commitment moderates the effect of the distraction manipulation on matching ratio, such that persistence is greater for those who are more, as opposed to less, committed to their goals.
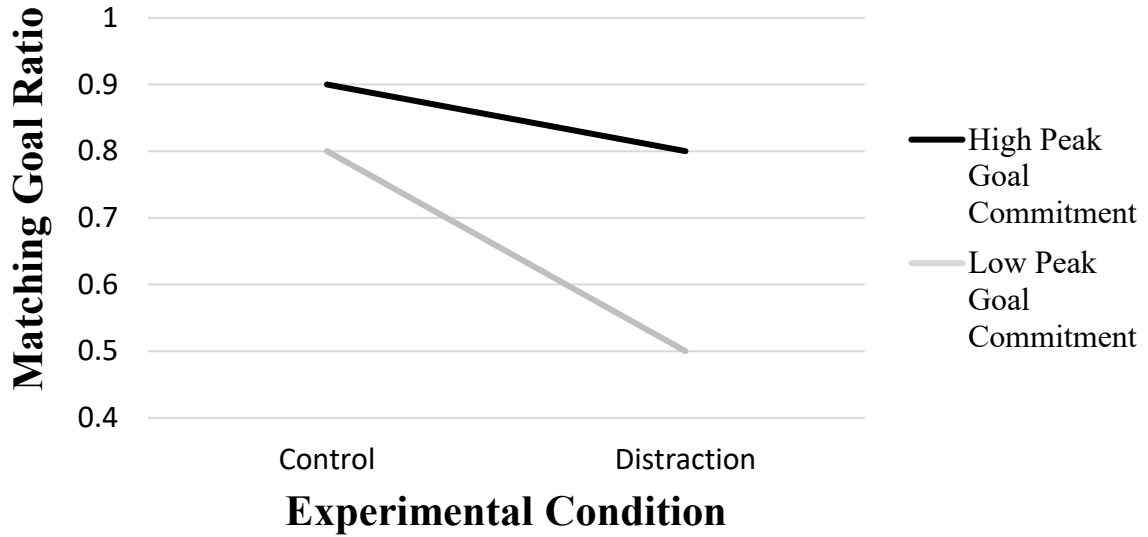
Figure 1. Peak goal commitment suggested interaction.

The other factor in time of goal construction is goal specificity, as goals that are more specific are more likely to have been thought about as well. See figure 2.

H3: Goal specificity moderates the effect of the distraction manipulation on matching ratio, such that a more specific peak will lead to greater goal persistence.
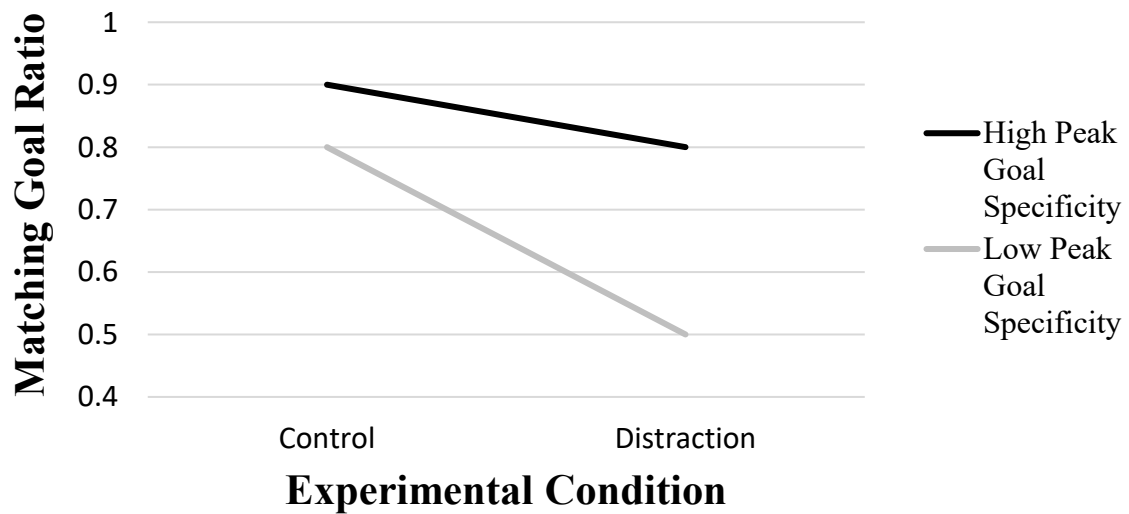
Figure 2. Peak goal specificity suggested interaction.

METHODS

Participants and Design

Two-hundred and twenty-four Introduction to Psychology students from a large Midwest public university were recruited by offering required research credit. Thirteen participants were excluded due to errors in reporting or recording. A single factor between-subjects experimental design was used; whereas, the experimental manipulation was whether students wrote about their goals in either the presence or absence of a working memory distraction task. IRB approval was gained for this research design, IRB-FY2017-71 on 9/30/2016.

Measures

Demographics. Students reported their gender, age, and whether they had a major. Additional demographic information collected included working status and number of hours per week, current major, year in college, and ACT score if available.

Peak Goal Commitment. Affective peak goal commitment was evaluated by participants on a seven-alternative scale with response options ranging from 1 (extremely strongly disagree) to 7 (extremely strongly agree). The scale was developed by McKenna (2014), and was shown to produce adequate reliability of $\alpha = .76$. (see Appendix J)

Peak Goal Specificity. Two raters evaluated peak goal specificity using two criteria: 1) The number of potential roles that could fulfill the goal, and 2) Additional information such as time, place, or qualifiers. Specificity was measured using a nine-

point scale validated between two raters with exact agreement of 75%, no disagreement greater than one point on the scale, and a reliability of α =.99. (see Appendix K)

Goal Reporting Counts. Matching ratio was computed to represent the accuracy of goal reproduction from time 1 to time 2 for the experimental and control groups. This ratio required three raters to evaluate the number of goals reported on the Goal Reporting Sheet (i.e., time 1), and the number of goals on the Structured Goal Reporting Sheet (time 2). Raters also evaluated the goals that appeared in both time 1 and time 2 reported by participants in the study. Matching ratio was then computed by dividing the matching goals by all goals set (i.e., matching goals/(time 1 goals set + time 2 goals set – matching goals)). The reliability for the three ratings performed by three raters were α = .94 for the number of goals set at time 1; α = .86 for the number of goals set at time 2; and α = .95 for raw number of goals matching from time 1 to time 2.

Manipulation

In Hazeltine, Ruthruff, and Remington (2006), the authors showed a mixing effect on distraction tasks in which a visual input – a word on a screen – and audio output – responding verbally with the word's category – resulted in higher levels of distraction than a comparable task with similar inputs and outputs. Changing the type of input and output, to a visual input and cognitive counting output, should retain the mixing effect. Apart from this change and corresponding required changes, the distraction task was functionally the same as the one used in Hazeltine, Ruthruff and Remington.

The distraction task (see Appendix D) consisted of a word being presented on a screen at a randomized time interval between 4 to 10 seconds. When the word was

presented, participants were required to make a cognitive count in the word's corresponding category. There were twelve words total and which word appeared was randomized by computer program. The twelve words and three categories were: ANT, FLEA, APHID, and BEETLE (Category: BUG); EGG, SOUP, CANDY, and COOKIE (Category: FOOD); OAK, PINE, CEDAR, and SPRUCE (Category: TREE).

Procedure

Participating students completed the experimental task in groups as large as twenty-eight. Students were assigned to experimental or control conditions by 'group' per a random procedure. For the first group, whether they were experimental or control was randomly determined just prior to the experiment. For each subsequent group, assignment was carried out with according to special rules (see Appendix L).

When students entered the room for the experiment, they were given an informed consent by the researcher, which included a generalized statement about the nature of the study and information about the rights of the participants (see Appendix A). The description of the experiment was left general so that students would not be primed to think about career goals prior to being asked to report. After all students for a given session were present, or at five minutes past the designated start time, the researcher closed the door to the room to initiate the study. Students then completed informed consent forms, if they had not done so already, and the researcher reminded students that they could withdraw from the study at any point. The researcher told students they needed a writing utensil for the study and a pencil was provided to students who needed one. The informed consent sheets were then collected.

For the experimental group only, the researcher gave students the distraction task sheet and reminded them not to write on it yet. The researcher then turned on the projector in the room displaying the distraction task PowerPoint (see Appendix E). The researcher proceeded to read distraction task instructions from a script (see Appendix B) and noted that the current task (distraction task) and another task would be performed at the same time. The researcher showed students an example of the completed distraction task sheet to ensure that students understood the task requirements. After instructions were read and the sample was explained, the researcher prompted students to ask questions if they had any.

For both the experimental and control groups, the researcher handed out two sheets of paper to each student and reminded them to not write on them until instructed to do so. These sheets were the Peak Goal Sheet (see Appendix G) and the Goal Reporting Sheet (see Appendix H). The researcher explained the purpose of the Peak Goal sheet, then provided students thirty seconds to complete the Peak Goal Sheet and reminded students that their written responses would be used to complete the next task. After thirty seconds elapsed, the researcher asked the students to stop writing, and virtually all students stopped within a few seconds of being asked. Next, the researcher read the instructions of the Goal Reporting Sheet. After delivering instructions, the researcher prompted students to ask questions to clarify task expectations.

For the experimental group, the researcher reminded students that the two tasks would need to be done at the same time (i.e., the distraction task and the completion of the Goal Reporting Sheet). Furthermore, the researcher noted that most time could be

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spent on the Goal Reporting Sheet and that attention was only needed for the distraction task when students heard the noise associated with a slide changing.

All students in the experimental and control groups were given ten minutes to complete the Goal Reporting Sheet. With only two exceptions in the entire study, all students completed their Goal Reporting Sheets prior to using the designated 10 minutes; however, the experimental group continued to complete the distraction task until the full 10 minutes expired. After the time allotted for reporting goals elapsed, the researcher instructed students to stop writing. For the experimental group, the researcher ended the PowerPoint and instructed students to write down their mental counts for the three categories of the distraction task. The researcher then collected the Goal Reporting Sheet and, for the experimental group, the distraction task sheet.

The researcher then handed students in both groups the Structured Goal Reporting Sheet (see Appendix I) and instructed them to not write on it yet. After all sheets were handed out, the researcher read the instructions for the sheet and explained an example, which appeared on the other side of the paper. The researcher then prompted for questions. Students were given ten minutes to complete the sheet. All students completed their Structured Goal Reporting Sheets prior to the full ten minutes. After ten minutes, the researcher instructed the students to stop writing. The researcher then collected the Structured Goal Reporting Sheet and Peak Goal Sheet.

After all goal-reporting was completed, the researcher handed each student a questionnaire (see Appendix J) and instructed them to not write on it until instructed to do so. After all questionnaires were handed out, the researcher told students that the questionnaire was confidential and to answer openly and honestly. The researcher also

instructed students to raise their hand if they had any questions while filling out the questionnaire, and to turn the questionnaire over when they were done. Students were given a timed 10 minutes to complete the questionnaire, but individual questionnaires were collected by the researcher as completed. All students completed the questionnaire before the full 10 minutes elapsed.

After questionnaires were completed, debriefing began. The researcher asked any student who suspected the purpose of the study to raise their hand. The researcher asked each student who raised their hand what they believed the purpose of the research was and whether their suspicion influenced what they wrote during the study. If any students had guessed close to the purpose or indicated their suspicion influenced their results, their results would have been marked for exclusion. However, no students were excluded for this reason. Afterwards, the researcher explained the purpose of the study and reminded students to not discuss the content of the study with anyone. The researcher solicited and responded to questions and asked students if they would like a copy of the informed consent. Finally, the researcher indicated the study was over and thanked the students for their participation.

Analyses were conducted using SPSS. Descriptive statistics of all variables

relevant to analyses can be found in Table 1.

Table 1. Descriptive Statistics

Variable	N	Range	M	SD
Gender	210	Female	65%	-
Age	210	18 - 25	18.88	1.16
Major	211		83%	-
Aff Commitment	211	3.57 - 7	5.53	.77
Specificity	211	1 - 9	5.66	2.55
Matching Goals	211	0 - 16	3.89	2.27
Total Goals	211	1 - 28	11.28	4.54
Time 1 Goals	211	1 - 20	6.59	2.92
Time 2 Goals	211	1 - 20	8.58	3.30
Matching Ratio	211	0 - 1	.40	.26

N = Sample size. M = Mean. SD = Standard deviation.

Correlations

Pearson product moment correlations were computed for study variables (see

Table 2). Correlations were as expected or otherwise unsurprising, with a few of note.

First, gender was significantly correlated with several variables, but did not directly

influence the IV or DV in the primary hypothesis and therefore was not included in

hypothesis testing. Second, peak goal specificity and commitment were correlated at r =

.30. This relationship is not commonly reported in motivation research, therefore could

be of interest to goal theorists. Finally, specificity was positively correlated to matching

goals and time 2 goals reported, suggesting that more specific peak goals lead to greater

generation of goals in goal structures when wholly undistracted.

Table 2. Correlational Analyses

Variable	1	2	3	4	5	6	7	8	9	10
Demographics										
1. Gender	--									
2. Age	-.19*	--								
3. Major	-.18*	.18**	--							
Moderators										
4. Aff Commitment	-.15*	.12	.25**	--						
5. Specificity	.08	.16*	.23**	.31**	--					
Goal Reporting										
6. Matching Goals	-.01	.17*	.10	.01	.14*	--				
7. Total Goals	.16*	-.00	.08	-.08	.09	.12	--			
8. Time 1 Goals	.10	.06	.12	-.10	.09	.57**	.69**	--		
9. Time 2 Goals	.13	.05	.07	-.02	.14*	.34**	.85**	.45**	--	
10. Matching Ratio	-.09	.11	.01	.05	.03	.64**	-.56**	-.02	-.32**	--

$* p < .05$, $** p < .01$

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Hypotheses

  Hypothesis 1. Hypothesis 1 predicted that the distracted group would have a significantly lower proportion of goals matching, over total goals generated. As previously discussed and justified, I used a ratio, as opposed to raw number of goals matching, because the predicted effect of the distraction on the raw number of matching goals, regardless of whether they were constructed on the spot or in memory. Time 1 goals reported were added to the regression analysis, to further partial out the predicted influence of the distraction on the reduced reporting of goals. The resulting variance the distraction explained is conceptualized in this study as being caused by those goals resulting from goal construction on the spot. The distraction condition significantly predicted matching goal ratio, ($\beta = -.193$, $t(208) = -2.72$, $p < .01$). This regression included the removal of variance from time 1 goals reported. The amount of variance explained by this model was also significant, ($\Delta R^2 = .035$, $F(2, 208) = 3.725$, $p < .05$). Overall, this shows weak support for hypothesis 1.

  Hypothesis 2. Hypothesis 2 predicted that those with low peak goal commitment would show a greater difference between experimental and control group, than those with high goal commitment. Peak goal commitment was included as a moderator in the regression between condition and matching ratio. The interaction between peak goal commitment and the distraction condition was not significant, ($\beta = -.120$, $t(206) = -1.77$, $p = .078$). An ANOVA was then computed using the interaction between commitment and experimental condition. The amount of variance explained by this model approached significance, but did not reach significance ($\Delta R^2 = .014$, $F(1, 206) = 3.136$, $p = .078$) and was in the opposite direction of prediction.
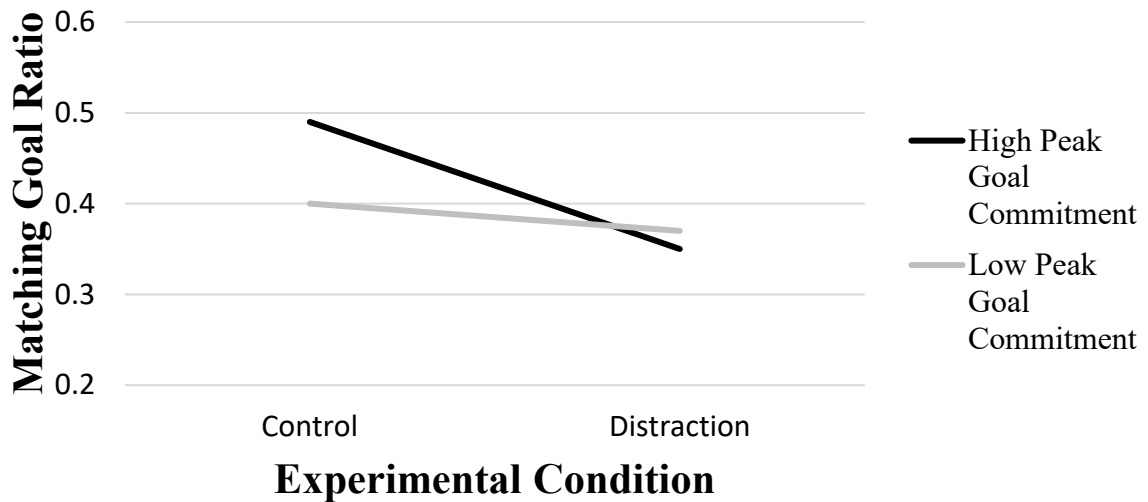
Figure 3. Peak goal commitment interaction.

Hypothesis 3. Hypothesis 3 predicted that those with low peak goal specificity would show a greater difference between experimental and control group, than those with high peak goal specificity. Peak goal specificity was included as a moderator in the regression between condition and matching ratio. The interaction between peak goal specificity and the distraction condition did not predict matching goal ratio, (β = -.059, $t(206)$ = -0.857, p = .393). The amount of variance explained by this model was also not significant, (ΔR^2 = .003, $F(1, 206)$ = .734, p = .393).

Additional Analyses

Part of the analyses strategy assumed that a different number of goals would be reported between the control and experimental group at time 1. The difference could confound the evaluation of consistency in goal structures from time 1 to time 2 because the differences in matched structures might be attributed to the differences in Time 1

reported goals. That is, those reporting fewer goals in time 1 might be at disadvantage for total number of goals matched. Therefore, to carry out this analysis strategy that involved controlling for these Time 1 goal differences, it was made necessary to test whether such differences existed. The distraction had a significant negative effect on the number of time 1 goals reported between those in the experimental (m = 5.80) and the control group (m = 7.45) (t = 4.26, p < .001). The distraction also predictably influenced raw number of matching goals, between experimental (m = 3.41) and control (m = 4.40) (t = 3.23, p = .001). No such difference in goals reported at time 2, or total goals, were found.

DISCUSSION

This study was the first of hopefully many attempts to understand the role of cognition in goal research. The results suggested that not all elements of reported goal structures are present in long-term memory. However, the results do not provide any information on why this occurs. Some guesses can be made, which can guide future investigations.

First, it is possible that goals that are more proximal are cognitively extended out of goals that are more distal. To be clearer, people would be more likely to store their vague and long term goals in their long-term memory, then use working memory to construct the related goal structures when needed, whether that need is for task performance, or reporting the goals. The low matching goal ratios for even the undistracted group gives weight to this idea. Furthermore, this notion would be consistent with discrepancy production theories of goals in self-regulation.

Second, some goals could be an exercise to rationalize concerns or anxiety. This would imply that individuals use goal setting to reduce negative cognitions and is consistent with discrepancy reduction theories of goals in self-regulation. Anxiety reduction would explain the counter-intuitive interaction of peak goal commitment with the distraction on matching ratio; those more committed to their peak goals would experience greater associated stress from thinking about them. Therefore they would generate more goals meant to address that stress when undistracted than those with lower commitment. For those distracted, this additional generation couldn't take place, or the stress was less present because of the mind being occupied by other thoughts.

Third, asking participants to report their goals could lead to social desirability effects, or activate achievement motivation. Those more influenced by these constructs would feel induced to increase reporting above those goals present in long-term memory. Distracting participants would either inhibit construction, or displace social desirability/achievement motivation onto the distraction task. This is the most easily testable explanation, as social desirability or achievement motivation could be measured in a replication of this study and included as another potential interaction term in the regression between experimental condition and matching goal ratio.

Another reported effect is also worth discussing. Time 2 goals and total goals not being influenced by experimental condition is an unexpected result if one assumed goal structures are wholly constructed on the spot. This lack of effect has two potential explanations. First, it could be the case that undistracted participants made up for most to all goals not written time 1, by producing them in time 2. This would suggest at least some goals are based in long-term memory. Second, it could be that there was a ceiling effect on participants' abilities to generate goals, such that there was enough time for all groups to hit their cognitive limits in producing goals from all potential sources when undistracted.

Limitations

This study contains several potential confounds, the potential effects of which can be addressed through future research. First, the use of predominately young college students could have limited the range of resulting career goal structures to those easily

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conceptualized by such a sample. Extending a study to include older working professionals may lead to a broader range of both peak goals and goal structures.

Second, the study relied upon a distraction task, but this design required more complicated analyses than potential alternatives. An alternative study and analysis design would be one in which both groups receive no distraction task, but the experimental group must wait longer than the control before reporting their goal structures a second time. So long as goals cannot be expected to change between the two reporting times, this alternative test should lead to greater decay of goals in working memory for the experimental group. Thus, the design is functionally similar, but easier to interpret.

Finally, outside raters were used to measure students' reported goals. Though these raters largely agreed, it is conceivable that these measures would be inaccurate compared to a student's own evaluation of their goal structures, if they were given the opportunity to compare their own goal sheets. Due to the imprecision of using language to report goals, it is entirely possible that matches were not caught due to students' inability to use similar enough language between reporting times. This is further compounded by the use of a phonological loop distraction task. It is even possible that the assumption of goals existing in verbal structures is wrong, and that goals are only converted into verbal structures for reporting.

Summary

Goal setting and self-regulation theory offer robust ability to predict human task performance. It has long been theorized that one of the mechanisms for this improvement is through cognitive strategy. It is further theorized that this strategizing is performed

through goal structures. However, participants in goal setting studies are offering at least some goals in response to reporting demands. This does not mean participants are not engaging in the exact same processes when generating goals in response to performance demands. Rather, the time of construction for goals is closer to goal-relevant demands than might be expected. This piece of the theoretical puzzle can be applied to explain seeming inconsistencies in goal setting effects. Future goal setting researchers would do well to consider cognitive processes involved in goal setting behavior. Finally, those who use goal setting theory in applied contexts might attempt differentiating between goals in long-term memory and goals generated from situational demands.

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APPENDICES

Appendix A. Informed Consent

Title of Research: Moderators in Information Processing

Supervising Professor: Thomas Kane, PhD, Psychology Department, Hill Hall 127
      Phone: 836-4901
      E-mail: TomKane@missouristate.edu

Project Leader: Monroe Pate, Graduate Student, Industrial/Organizational Psychology Program
Contact Information: Monroe1@live.missouristate.edu

This research is being conducted to increase our understanding of how students process information about themselves. This study has been approved by the University Institutional Review Board, which determined that our procedures meet ethical standards and are safe to you. You can benefit from this study through participation and, after participating, learning what this research is about. You will also gain course credit through your full participation in the study. You can request a summary of the study findings by e-mailing Monroe1@live.missouristate.edu at the end of the Spring 2017 semester.

If you choose to participate in this study, you will complete a series of tasks and a questionnaire that will take no more than forty-five minutes to complete. All personal information related to your participation in this study will be kept strictly protected and confidential. Your identity will not be connected to the information that you provide, therefore, the information you provide will be confidential.

You may discontinue your participation in this research at any time. You will not be penalized if you decide to withdraw from this study. If you have questions, please contact one of the researchers at any point during this study.

I VERIFY THAT I HAVE READ AND FULLY UNDERSTAND THE STATEMENT OF PROCEDURE AND THAT I MAY TERMINATE MY PARTICPATION IN THIS STUDY AT ANY TIME WITHOUT PENALIZATION. I FURTHER VERIFY THAT I AM AT LEAST 18 YEARS OF AGE.

Print Name_____   Signature: _____

For Credit Purposes:

    Class (e.g., PSY xxx):_____Days/times course meets _____

    Your Professor:_____

Appendix B. Researcher Script (Experimental)

ON-SITE PREP:

- Researchers will prepare the room before the study begins by placing an informed consent form at each station and …

- Turning on the computer and loading the macro-enabled PowerPoint distraction and distraction task example sheet.

- All times will be enforced with a timer, physical or digital

BEGIN:

- Students can enter the classroom before the study begins.

- At five minutes after the scheduled start time (or after all participants arrive), the study will begin.

- To initiate the study, the researcher says,

"In front of you is an informed consent, to indicate you understand your risks and rights involved in the study. Please read over it and sign at the bottom. So that I know you are done, please turn the sheet over after you sign it. Please know that this experiment is voluntary and that you may withdrawal from participation at any time."

- *"Does anyone need a writing utensil? You will need one during this research."* The researcher passes out pencils to any participant that needs one.

- Researcher collects informed consent.

- The researcher pulls up the distraction task PowerPoint and example sheet.

- The researcher says:

"You will be completing two tasks at the same time. This PowerPoint is the first task. For ten minutes, this PowerPoint will display words. Each word belongs to one of three categories. You will receive a sheet of paper with all three categories, but do NOT write on it or make any marks until after 10 minutes. There are 3 categories with 4 words each, and each time one of 12 words comes on screen, you will need to mentally add one to that word's category. You will be notified when 10 minutes have passed, at which point you will write down the three numbers for each category. The categories are BUG, FOOD, and TREE. The BUG words are: ANT, FLEA, APHID, and BEETLE. The FOOD words are: EGG, SOUP, CANDY, and COOKIE. The TREE words are: OAK, PINE, CEDAR, and SPRUCE. Here is an example."

- The researcher will show an example sheet on the screen. *"This person saw BUG words 31 times, FOOD words 35 times, and TREE words 26 times."*

- The researcher will then start the PowerPoint and say, *"This word is [word], therefore you'd mentally add one to category [category]."*

- After a little time has passed, a new word should pop up on screen. *"Then this word is [word], which is category [category], so you'd mentally add one there. If there are any questions about this first task, please ask them now."*

- After addressing questions, the PowerPoint will be exited

- Sheets of paper for the distraction task will be passed out.

<u>FOR ALL:</u>

- Sheets for the peak goal and written goal setting will be passed out. The researcher will say, "***Please do not write anything yet.***"

- The researcher will explain,

"Please look at the sheet which says Peak Goal Sheet. On this piece of paper, you will write down your most important career-related goal that you wish to accomplish in the next five to ten years. Be optimistic, yet realistic. It is ok if you don't know exactly what you want to do and, if you do not, then write more generally about what you would want most in your future career. Please do this now, before the task begins, as you will use what you write during the task. You have thirty seconds."

- Students are given thirty seconds to write their peak career goal. Then, the researcher will respond, ***"Time is up."***

- The researcher will then say, ***"Okay, now look at the sheet which says Goal Reporting Sheet. Please read the instructions while I read them out loud."***

- The researcher will then read the Written Goals sheet instructions out loud. ***"Are there any questions?"*** After questions are answered, the researcher can move on.

<u>INSTRUCTIONS:</u>

- The researcher will say,

"You are expected to do both tasks at the same time. Continue writing your goals for as long as you have goals to write, up to the ten-minute time limit. Because the screen changes only occasionally, you can focus most of your time on writing your goals. However, make sure you look up during the sound effect so you can catch new words." The PowerPoint will be restarted *"Is everyone ready?"*

<u>TASKS:</u>

- *"Begin."* After 10 minutes, the researcher says *"Ten minutes are up. Write down your mental counts for each of the three categories. I'm collecting the Goal Reporting Sheet and 3 categories sheet."* and all written goal and distraction task sheets are collected.

- Students will then be given the structured goal sheet and the researcher will explain

"Do not write yet. Please look at the sheet just handed out which says Structured Goal Reporting Sheet. Please read the instructions while I read them out loud."

- The researcher reads the Structured Goals sheet instructions and asks, *"You may make boxes as large or small as needed. You will be given ten minutes to write on this sheet. Continue writing until you are out of goals. Are there any questions?"*

- After questions have been answered, the researcher says, ***"You also have ten minutes for this task. Begin."***

- After ten minute, the researcher says ***"Ten minutes are up. I will collect both sheets."*** and the Structured Goals and Peak Career sheets are collected.

QUESTIONNAIRES:

- Finally, students are given the questionnaire and are told,

  "For this questionnaire, please read the instructions carefully and fill out the questionnaire accurately and honestly. Results are confidential and will not be tied to your name. If you have a question while filling out the questionnaire, please ask. You will be given 10 minutes to fill it out. Please turn your questionnaire over when you are done. Begin."

- Students will be given 10 minutes to complete this task, but this section may end early if all students complete it early.

DEBRIEFING

- After all questionnaires are turned in, debriefing will begin.

- Students will be told the purpose of the study,

  "It is time to debrief you all on the purpose of this study. I ask that you please do not tell others in your class about what you did in this study and what the purposes of this research were. First, please raise your hand if you suspected what this study was about." Participants who suspected the purpose

of the study will be asked *"What did you believe the purpose of the study was?"* and *"Did your suspicion influence what you wrote down?"*

- Participants who guess close to the purpose of the study, or affirm their suspicions influenced their result, will have their results marked for exclusion.

- The researcher will then explain,

"The purpose of this study was to assess the methodology of self-reported goals. Specifically, whether asking people to report their goals causes them to make up goals on the spot. Later, the Written Goal and Structured Goal sheets will be compared for their missing rate, which would be the number of goals that are in the Written Goal sheet, but not the Structured Goal sheet. Missing rates will then be compared between the experimental group, who were distracted while completing Written Goals, and control group who were not distracted. This is done because the distraction interferes with working memory, which would be necessary to memorize goals you made up on the spot. To repeat, please do not discuss the content of this study with anyone, as they or someone who overhears you could be a participant, which would ruin their results. Are there any questions?"

- If they have any questions, they will be answered.

- Students will be asked, *"Would any of you like a copy of the informed consent?"* Copies will be given to those that ask for it.

- Finally, the researcher will say, *"The study is now over, thank you for your time."*

-

Appendix C. Researcher Script (Control)

ON-SITE PREP:

- Researchers will prepare the room before the study begins by placing an informed consent form at each station and …

- All times will be enforced with a timer, physical or digital

BEGIN:

- Students can enter the classroom before the study begins.

- At five minutes after the scheduled start time (or after all participants arrive), the study will begin.

- To initiate the study, the researcher says,

"In front of you is an informed consent, to indicate you understand your risks and rights involved in the study. Please read over it and sign at the bottom. So that I know you are done, please turn the sheet over after you sign it. Please know that this experiment is voluntary and that you may withdrawal from participation at any time."

- *"Does anyone need a writing utensil? You will need one during this research."* The researcher passes out pencils to any participant that needs one.

- Researcher collects informed consent.

<u>FOR ALL:</u>

- Sheets for the peak goal and written goal setting will be passed out. The researcher will say, "***Please do not write anything yet.***"

- The researcher will explain,

"Please look at the sheet which says Peak Goal Sheet. On this piece of paper, you will write down your most important career-related goal that you wish to accomplish in the next five to ten years. Be optimistic, yet realistic. It is ok if you don't know exactly what you want to do and, if you do not, then write more generally about what you would want most in your future career. Please do this now, before the task begins, as you will use what you write during the task. You have thirty seconds."

- Students are given thirty seconds to write their peak career goal. Then, the researcher will respond, ***"Time is up."***

- The researcher will then say, ***"Okay, now look at the sheet which says Goal Reporting Sheet. Please read the instructions while I read them out loud."***

- The researcher will then read the Written Goals sheet instructions out loud. ***"Are there any questions?"*** After questions are answered, the researcher can move on.

TASK:

- ***"You will have ten minutes to complete this task. Begin."***

- After 10 minutes, the researcher says ***"Ten minutes are up, I'm collecting the Goal Reporting Sheet, not the peak goal sheet."*** and all written goal sheets are collected.

- Students will then be given the structured goal sheet and the researcher will explain

"Do not write yet. Please look at the sheet just handed out which says Structured Goal Reporting Sheet. Please read the instructions while I read them out loud."

- The researcher reads the Structured Goals sheet instructions and asks, *"****You may make boxes as large or small as needed. You will be given ten minutes to write on this sheet. Continue writing until you are out of goals. Are there any questions?"***

- After questions have been answered, the researcher says, ***"You also have ten minutes for this task. Begin."***

- After ten minute, the researcher says ***"Ten minutes are up. I will collect both sheets."*** and the Structured Goals and Peak Career sheets are collected.

QUESTIONNAIRES:

- Finally, students are given the questionnaire and are told,

  "For this questionnaire, please read the instructions carefully and fill out the questionnaire accurately and honestly. Results are confidential and will not be tied to your name. If you have a question while filling out the questionnaire, please ask. You will be given 10 minutes to fill it out. Please turn your questionnaire over when you are done. Begin."

- Students will be given 10 minutes to complete this task, but this section may end early if all students complete it early.

DEBRIEFING

- After all questionnaires are turned in, debriefing will begin.

- Students will be told the purpose of the study,

  "It is time to debrief you all on the purpose of this study. I ask that you please do not tell others in your class about what you did in this study and what the purposes of this research were. First, please raise your hand if you suspected what this study was about." Participants who suspected the purpose of the study will be asked ***"What did you believe the purpose of the study was?"*** and ***"Did your suspicion influence what you wrote down?"***

- Participants who guess close to the purpose of the study, or affirm their suspicions influenced their result, will have their results marked for exclusion.

- The researcher will then explain,

"The purpose of this study was to assess the methodology of self-reported goals. Specifically, whether asking people to report their goals causes them to make up goals on the spot. Later, the Written Goal and Structured Goal sheets will be compared for their missing rate, which would be the number of goals that are in the Written Goal sheet, but not the Structured Goal sheet. Missing rates will then be compared between the experimental group, who were distracted while completing Written Goals, and control group who were not distracted. This is done because the distraction interferes with working memory, which would be necessary to memorize goals you made up on the spot. To repeat, please do not discuss the content of this study with anyone, as they or someone who overhears you could be a participant, which would ruin their results. Are there any questions?"

- If they have any questions, they will be answered.

- Students will be asked, *"Would any of you like a copy of the informed consent?"* Copies will be given to those that ask for it.

- Finally, the researcher will say, *"The study is now over, thank you for your time."*

Appendix D. Distraction PowerPoint Code

(In PowerPoint's Visual Basic Macro System)

```vba
Sub randomSlide()

    'Goes to a random powerpoint slide

    Randomize

    ActivePresentation.SlideShowWindow.View.GotoSlide

Int((ActivePresentation.Slides.Count - 1 + 1) * Rnd + 1)

End Sub


Public Function slideDelay() As Integer

    'When ran, returns a number 4 through 10

    Randomize

    slideDelay = Int((10 - 4 + 1) * Rnd + 4)

End Function


Public Function waitABit() As Integer

    'Counting and delaying function so the program can stop on the appropriate slide for 4

to 10 seconds, and know how long it has been on that slide

    Dim thisDelay As Integer

    thisDelay = slideDelay()

    Start = Timer

    Do While Timer < Start + thisDelay

        DoEvents
```

```vba
        Loop

    waitABit = thisDelay

End Function


Sub fullEffect()

    'The full distraction

    Dim timeElapsed As Integer

    timeElapsed = 0

    'The 587 value is the amount of time the loop should function for, not counting the

final loop. This means the program can run from anywhere from 587 to 597 seconds (10

second var)

    Dim totalTime As Integer

    totalTime = 587

    'For the duration of up to 597 seconds, changes slides every 4 to 10 seconds

    Do While timeElapsed < totalTime

        timeElapsed = timeElapsed + waitABit()

        randomSlide

    Loop

End Sub
```

Appendix E. All PointPoint Slides

APHID

BEETLE

EGG

SOUP

CANDY

COOKIE

OAK

PINE

CEDAR

SPRUCE

Appendix F. Distraction Task Reporting Sheet

Instructions: DO NOT WRITE ON THIS SHEET UNTIL INSTRUCTED, AT THE END OF THE TASK. When the task is over and you are instructed, write your mental count for each category.

_____

BUG

_____

FOOD

_____

TREE

Peak Goal Sheet

Instructions: On this sheet, write your most important and long-term career goal. Only write one goal.

Goal Reporting Sheet

Instructions: On this sheet, write all of your goals meant to help you achieve your important and long term goal from the Peak Goal Sheet. If you have sub-goals for your goals, also write them.

Structured Goal Reporting Sheet

Instruction: Put your peak goal from the Peak Goal Sheet in the box.

Instructions: On this sheet, write one box per goal meant to help you achieve your peak goal above. Also make one box per sub-goal. Draw lines connecting goals. See the other side for an example.

EXAMPLE

This example uses writing a paper as the peak goal.

```
                        ┌─────────────────┐
                        │   Peak Goal:    │
                        │ Writing a Paper │
                        └─────────────────┘
        ┌───────────────────────┬───────────────────────┐
        │ Get feedback on themes │ Outline Paper │ Read Research │
        │    from professor      │               │               │
        └───────────────────────┴───────────────────────┘
        ┌───────────────────────┬───────────────────────┐
        │  Come up with paper    │ Read Example Papers │ Gather Research │
        │       themes           │                     │                 │
        └───────────────────────┴───────────────────────┘
        ┌───────────────────────┐
        │   Read Instructions    │
        └───────────────────────┘
```
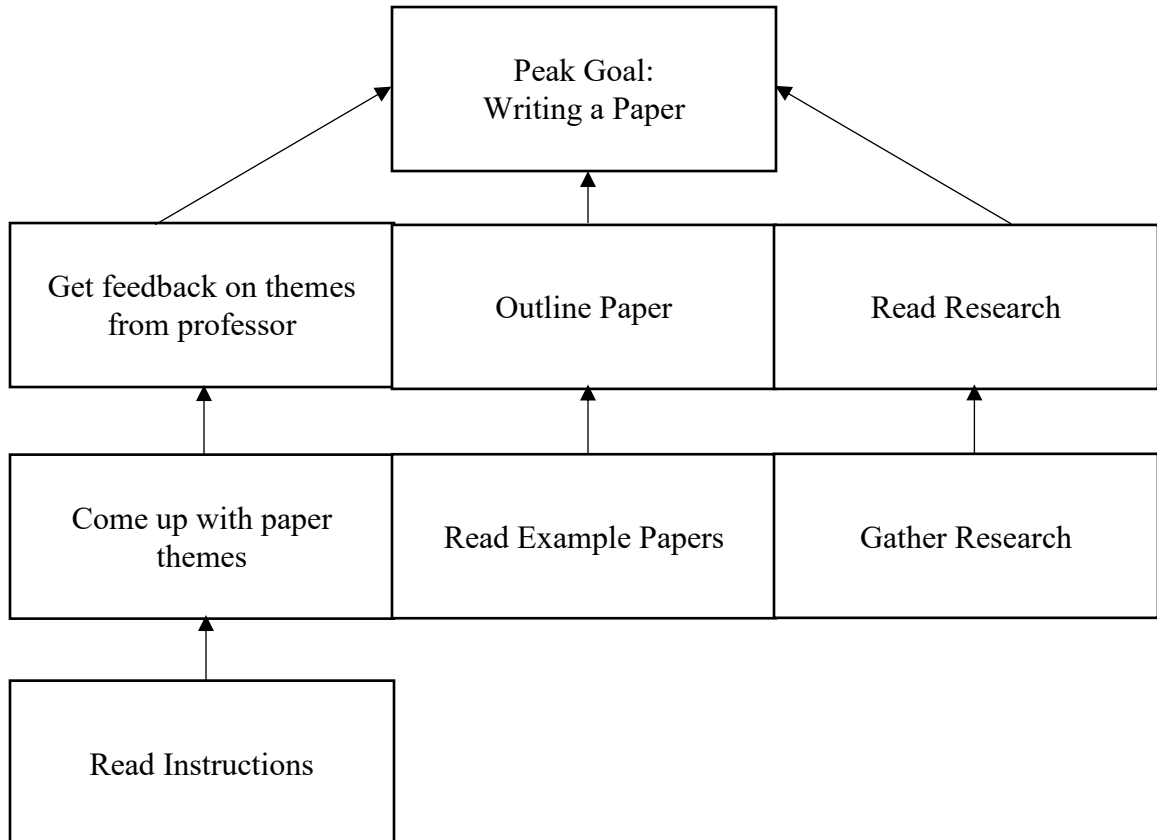
Appendix J. Questionnaire

<div align="right">

Participant #_____

</div>

<div align="center">

Study Questionnaire

PART I: CAREER GOAL FIT

</div>

Use the following scale to answer the following questions about your <u>*reported peak career goal:*</u>

1- Extremely   2- Strongly   3- Disagree   4 Neutral   5- Agree   6- Strongly   7- Extremely
  strongly   disagree   agree   strongly
  disagree   agree

<div align="right">

Enter (1 to 7)

</div>

1. Attaining my career goal is important to my self-image.   _____

2. Attaining my career goal will make me proud of myself.   _____

3. I feel unusually passionate about reaching my career.   _____

4. My career goal is perfect for me.   _____

5. I may regret my career goal choice.   _____

6. I can't imagine ever lowering my career goal.   _____

7. Compared to other students I know, I have a lot of passion for my career goal.   _____

8. It would be too costly for me to change my career goal at this point in my life.   _____

9. Attaining my career goal is financially important to me.   _____

10. I have invested too much time to change my career goal now.   _____

11. I want to reach this goal because it will allow me to get other things I value in life.   _____

12. I want to reach my career goal because it will make other people who are important to me proud.

                                                                                                    _____

13. I want to reach my career goal because it will show others that I am a successful person.   _____

14. I often have doubts about reaching my career goal.   _____

15. I'm not sure that I will excel in my chosen career.   _____

16. I may not be able to do all that it takes to attain my career goal.   _____

PART II: DEMOGRAPHICS

Please circle or write your response.

1. Gender: MALE / FEMALE

2. What is your age? _____

3. Are you currently working? YES / NO   If yes, hours per week? _____

4. Have you declared a major? YES / NO   If yes, what major? _____

5. What is your year in college? FRESHMAN / SOPHMORE / JUNIOR / SENIOR / SENIOR+

6. What overall score did you get on your ACT? If you can't remember, make your best guess. If you

   didn't take the ACT, put N/A. _____

PART III: OPINION OF CAREER GOALS

Enter your confidence for each statement from 0% (No confidence) to 100% (Complete Confidence) in the space to the right.

Confidence

(0% to 100%)

1. I will make progress toward attaining my career goal this semester.   _____

2. My accomplishments this semester will exceed what is necessary to assure progress toward my career

   goal.   _____

3. I will attain my career goal in the time span that I envision attaining it.   _____

4. I will not only attain my career goal, but I will excel as a top achiever in my chosen career.   _____

5. If I don't end up in the career that I envision, then the career that I end up pursuing

   will be at least as challenging as my stated career goal.   _____

6. I will perform at least as well as the average professional in my chosen career.   _____

7. I will become well-known as 'exceptional at what I do' in my chosen career.   _____

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PART IV: Other

Please circle your response

1. How often do you think about your career goals?   Daily / Weekly / Monthly / Yearly / Never

2. How many times do you typically meet with your academic advisor per semester?   0 / 1 / 2 / 3 / 4+

Use the following scale to answer the following questions:

1- Strongly disagree	**2- Disagree**	**3- Neutral**	**4- Agree**	**5- Strongly agree**

Enter (1 to 5)

3. In the past, I have received feedback from teachers that has made me feel like a good writer.   _____

4. I believe I am a good writer.   _____

5. Compared to other college students, I am a better writer.   _____

6. I may regret my career goal choice.   _____

7. I frequently discuss my career goals with friends or family.   _____

8. I frequently discuss career goals with my academic advisor.   _____

9. I am very satisfied with the help my academic advisor has given me.   _____

10. I believe my academic advisor has done a great job in helping me.   _____

11. My academic advisor has been a useful resource to me.   _____

12. My advisor has provided me useful guidance about my career goals.   _____

Please circle how distracted you felt for each of the two situations below.

13. How distracted I felt while attempting to develop my written goals the first time. (When you wrote your goals)

1 Not at all   2 A little   3 Somewhat   4 A lot   5 Completely

14. How distracted I felt while attempting to remember my goal structure the second time. (When you put goals in boxes)

1 Not at all   2 A little   3 Somewhat   4 A lot   5 Completely

Appendix K. Peak Goal Specificity Rating Sheet

Goal specificity rating (base score):

    a. Broad: Get a job (1)

    b. Somewhat restricted: Get a job in {field} (4)

    c. Restricted: Get a job as {specific role} (7)

Additional information (+1 specificity per):

    a. Time

    b. Place

    c. Qualifier ("good" job, "well-paying" job, so on)

Range: 1 through 9

Examples:

1: Find a job/graduate/do my best (1 for base)

2: Find a job that makes me happy (1 base for get a job, +1 for one qualifier)

3: Get a job that makes me happy and pays a lot (1 base, +2 for two qualifiers)

4: Get a job in medicine (4 base)

5: Get a job in medicine by the time I graduate (4 base, +1 for time)

8: Get a well-paying job in medicine by the time I graduate (4 base, +1 for time, +1 for one qualifier)

7: Get a job as a doctor (7 base)

8: Get a job as a doctor at a major hospital (7 base, +1 for place)

9: Get a job as a doctor at a major hospital within ten years (7 base, +1 for place, +1 for time)

Sub-goals do not increase specificity rating, as these can be expected to be replicated in the goal-structure and therefore would skew results for a significant specificity effect

Appendix L. Random Assignment Rules

1. If the previous group was randomly assigned, the following group was given the opposite condition.

2. If the previous group was not randomly assigned, then the number of participants so far assigned to each group was assessed.

   a. If the condition the previous group was in had a lower number of participants thus far, the following group was assigned to the same condition.

   b. Otherwise, the following group was randomly assigned.

3. The final group was assigned to the condition with the lowest number of participants.