

Examining the Influence of Goal Attainment Scaling on Changes in Goal Attainment
in a Coaching Versus Non-Coaching Context

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ABSTRACT

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This study examined the impact of two interventions on goal attainment: Goal attainment scaling (GAS) and coaching. Participants identified a goal they were motivated to pursue over the course of approximately 4 weeks. Half the participants received coaching to support their goal attainment and half did not, while all participants were randomly assigned to either a GAS or No-GAS condition. GAS is an interview technique in which the researcher (1) discusses how the goal articulated connects to the participant's "big picture" objective and (2) identifies potential "micro" outcomes that are specific and behavioral. GAS is a recognized outcome assessment technique originally created for the mental health field (Kiresuk & Sherman, 1968) but has been applied in numerous contexts over the past forty two years, including educational settings (Schlosser, 2004). It has been suggested that the technique may facilitate the goal attainment of participants, and recently that GAS may work well with coaching (Spence, 2007). This study was the first to examine the intersection of the two techniques' influence on goal attainment. Results indicate that the effectiveness of the interventions depended on the type of goal articulated by participants (career versus personal), whether it was a "big picture" or "micro" goal, and the degree of conscientiousness of participants.

Keywords: goal attainment scaling, coaching, goal type, goal order, conscientiousness

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Chapter 1: Introduction

The purpose of this study was to examine whether or not the Goal Attainment Scaling (GAS) interview technique increased a participant's goal attainment in a coaching context. While researchers have suggested that GAS likely facilitates a participant's goal attainment (Schlosser, 2004), this had not been empirically examined. This study was the first to test this hypothesis directly and to explore potential moderating and mediating variables utilizing a randomized controlled between-subject design. This chapter reviews this study's context, namely the undeveloped state of coaching research in general, including the lack of empirically verified techniques. The chapter also identifies goal attainment as an important outcome variable in coaching research and reviews the GAS process. Lastly, the chapter concludes by identifying how this study can contribute to the coaching and GAS research literatures.

Background and Scientific Justification

Coaching is an enormously popular intervention that lacks rigorous outcome research. According to one of the leading global professional coaching associations, there are approximately 10,000 coaching practitioners in the US, and 18,000 worldwide (International Coaching Federation, 2011). The coaching industry is growing globally with an estimated market value between one and two billion US dollars (Orenstein, 2006). Despite this, coaching research is in its infancy (Passmore & Gibbs, 2007), with recent reviews highlighting the fact that out of the 234 coaching outcome studies published since 1980, only 13 utilize a randomized between-subjects research design (Grant, 2011). As a result, there is little empirical evidence that justifies coaching's widespread practice (Bennet, 2006; Lowman, 2005).

A fundamental difficulty of coaching outcome research is the extreme heterogeneity of issues, problems and goals in different coaching interventions, making it difficult to identify

outcome measures which are applicable to a range of coaching interventions (Greif, 2007). Identifying outcome measures that are relevant to a range of coaching interventions encourages their repeated use and replication studies, which ultimately helps determine the circumstances under which coaching may be efficacious. As Greif (2007) states, “Scientific proof of the effectiveness of coaching requires samples with comparable results and replication studies” (p. 226). One such outcome measure is goal attainment. Goal attainment is defined in the literature as the degree to which goals are successfully achieved or realized by coachees (Spence, 2007). It has been described as a general outcome measure not logically dependent on the specific intervention applied (Greif, 2007). The variable has been utilized by nine experimental coaching studies published in peer-reviewed journals, which is noteworthy given the lack of existing experimental studies on coaching. A research focus on goal attainment also makes sense since coaching is, at its core, a goal-focused process (Grant, 2003). Professional associations, researchers, and practitioners commonly explicate the importance of goal-setting during coaching. For example, the International Coaching Federation (2011) describes the coaching process as, “Coaches help people set better goals and then reach those goals.” Coaching researcher Spence elaborates: “The articulation and clarification of personal goals is...central to the coaching process and these goals are generally set to stretch an individual’s capacities...Coaches seek to accelerate goal attainment by helping individuals develop and implement solutions to the ongoing challenges faced during goal striving” (2008, p.60). When coaching is defined in such a way, goal attainment becomes a key dependent variable for measuring the outcome of a coaching intervention.

Advancing the field of coaching outcome research requires an understanding of coaching techniques that enhance goal attainment, and under what conditions or circumstances this occurs.

As Greif (2007) states, “[Future coaching research] needs more theoretically founded instruments...which can be applied to test the predicted specific effects of different types of coaching intervention” (p. 226). The following study seeks to deepen understanding of the potential impact a coaching intervention called Goal Attainment Scaling, or GAS, may have on a participant’s goal attainment.

GAS has recently been proposed as one approach to enhancing goal attainment during coaching (Spence, 2007). GAS was originally created for the mental health field by Kiresuk and Sherman (1968) and the technique has been applied in numerous contexts including clinical professions such as physical therapy, occupational therapy, and psychotherapy, as well as educational settings (Schlosser, 2004). Research has demonstrated GAS to be particularly useful in programs that involve specific goals (MacKay & Lundie, 1998). GAS involves an interview with a researcher, or helping professional such as a coach, to yield the creation of a GAS chart for the participant.

GAS technique: a procedural description. The exact steps a researcher or coach takes to create a GAS chart with a participant in a coaching context has been documented previously (Ottenbacher & Cusick, 1990; Spence 2008) and this study followed the eight procedures articulated in Table 1. An example chart, created by the steps outlined in Table 1, is displayed in Figure 1.

Utilizing GAS in coaching could benefit both the researcher and the person being coached, or coachee. GAS charts encourage objectivity and reduce bias by making goals specific, observable and behavioral. As such, they allow for more exact measurement of change, which is of particular interest to researchers. Furthermore, the GAS process encourages collaboration between the coachee and the researcher or coach. The process engages coachees in

goal-oriented cognitions (e.g., self-reflection, planning), and helps coachees operationalize higher-order goals to a level where they can see a range of specific outcome options (Spence, 2007). Furthermore, Spence (2007) hypothesizes that the GAS process may facilitate greater goal attainment by coachees through the stimulation of intermediary mechanisms including an increase in goal planning and goal commitment. In a review of GAS studies from other fields, including Burgee's (1996) study on teacher-support consultation and Parilis's (1996) dissertation on college student goal setting, Schlosser (2004) also concluded that GAS may facilitate goal attainment. However, this core proposition and its corollary assumptions and mechanisms, were untested.

This Study's Contribution

Despite GAS's track record as a recognized technique in numerous professional helping contexts, and despite theoretical proposals by numerous researchers (e.g., Schlosser, 2004, Spence, 2007), there was no empirical evidence that GAS may facilitate a participant's goal attainment in a coaching context. Furthermore the mechanisms by which GAS may facilitate goal attainment had not been explored empirically. The following study was the first to test whether GAS influences goal attainment. It also explored a number of mediating and moderating variables to help explore *why* and *when* GAS may influence a participant's goal attainment. Finally, this study compared the impact GAS may have on goal attainment when supported by coaching to when the technique is enacted without coaching. Few studies have examined the impact of GAS as a "stand-alone" intervention, and parsing out the impact coaching may have on the technique would help advance the coaching literature in particular. The results may help coaches and researchers know if coaching significantly enhances GAS's influence on goal attainment. Such knowledge may be particularly useful to the emerging coaching outcomes

literature given goal attainment's centrality in coaching processes and its utility in diverse contexts.

Overall, this study sought to advance the knowledge of GAS as an intervention technique. Knowledge gained from this study's application of GAS may contribute to the multi-disciplinary body of empirical literature supporting GAS and further knowledge of the technique's effective use in various professional helping contexts, such as coaching.

Chapter 2: Literature Review

Empirical Coaching Research

Coaching is an extensive practice in organizations today with an estimated 25,000 coaches globally (International Coach Federation, 2011). As a fast-growing industry (Williams, 2007) estimates of coaching's global market ranges from \$1Bn (Liljenstrand & Nebeker, 2008) to \$2Bn (Fillery-Travis & Lane, 2006) per annum. Despite its popularity, there is little empirical evidence substantiating this extensive practice (Bennett, 2006; Kampa-Kokesch & Anderson, 2001; Kilburg, 2000, 2004; Stevens, 2005) and coaching research appears to still be its infancy (Passmore & Gibbs, 2007).

A major meta-analysis in 2001 identified a severe dearth of empirical studies on the efficacy of coaching (Kampa-Kokesch & Anderson), and while recent reviews acknowledge an increase in outcome research (Grant, 2011; Grant & Cavanaugh, 2007; Passmore & Gibbs, 2007) few studies satisfy minimum standards of academic rigor (Greif, 2007). These standards includes (1) research which measures and predicts outcomes using reliable and valid scales, (2) experimental studies with control or comparison groups and random assignment of the participants to the groups, and (3) quasi-experimental studies without random assignment (Greif, 2007). A similar conclusion is drawn by Grant's summary of seventy plus years of coaching research (2011):

The first peer-reviewed paper on coaching was published in 1937. Between 1937 and 1st January 2011 there were a total of 634 published papers. There have been 234 outcome studies published since 1980; 131 case studies, 77 within-subject studies and 25 between-subject studies. Of the 25 between-subject studies, only 13 were randomized studies.

The majority of coaching outcomes research conducted over the past three decades used a single-group, pretest posttest design (Grant, 2011). This research design is vulnerable to

numerous internal validity threats, such as history and maturation (Campbell & Stanley, 1966), and limits the use inferential statistics to support conclusions. Case studies were the second most popular design (Grant, 2011), which are useful in generating coaching effectiveness theories but do not usually entail quantitative data analysis or necessarily have generalizability. Overall, recent reviews do also indicate that the knowledge base underpinning coaching appears to be growing at an exponential rate and the quality of coaching research is slowly moving towards greater scientific rigor, including an increase in between-subjects studies (Grant, 2011).

Challenges of coaching research. Coaching researchers suffer from many of the dilemmas faced by field researchers including the lack of political will and support from organizations, lack of funding, the competing needs of various stakeholders (e.g., client, coach, researcher, program administrator), and relatively small sample sizes (Bennett, 2006). Table 2 documents the sample sizes of coaching outcomes studies that utilize a between-subjects research design.

A serious challenge to coaching outcome research is that coaching interventions are conducted in a variety of different contexts that contain different issues, problems and goals. This makes it difficult to identify outcome measures that are applicable and useful to a range of coaching interventions (Greif, 2007). As noted earlier, identifying outcomes measures that are relevant to a range of coaching interventions encourages their repeated use and replication studies, which ultimately helps determine the circumstances under which coaching may be efficacious. Empirical coaching research is similarly hindered by a lack of measurement tools. Few validated instruments are used (Greif, 2007) and few measurement methods are applied across the diverse contexts in which coaching is utilized. Different outcomes are valued and measured in different contexts, and a large variance of coaching methods and approaches has

appeared. Since coaching is not a regulated field there are no standard approaches, no universally accepted competencies, and little accountability for practitioners. This is not entirely unexpected as coaching is arguably a new profession.

Overall, despite the challenges discussed above, there are reasons to be optimistic regarding the profession and the future of coaching research. Steps are being taken towards the professionalization of the field, including the emergence of a number of global coaching associations, such as the International Coaching Federation. Researchers have called for the creation of more theoretically founded instruments to test predicted specific effects of different types of coaching interventions (e.g., Greif, 2007). Finally, a promising stream emerging in the coaching literature entails the importance of goals in the coaching process and the use of goal attainment as a dependent variable.

The importance of goals in coaching. Numerous professional associations and authors define coaching as involving goals. For example the International Coaching Federation states: “Coaches help people set better goals and then reach those goals; ask their clients to do more than they would have done on their own; focus their clients better to more quickly produce results; [and,] provide the tools, support and structure to accomplish more” (2011). Wilkins (2000) notes, “Coaching is a one-on-one relationship where a coach supports, collaborates with, and facilitates client learning by helping a client to identify and achieve future goals through assessment, discovery, reflection, goal setting and strategic action” (p. 5). Furthermore, authors, organizations and researchers commonly offer coaching process models that seek to identify and achieve coachee goals. For example, goal-focused coaching, is posited by Grant (2003) as “a collaborative, solution-focused and systematic process aimed at enhancing performance, self-

directed learning and well-being.” Goal setting is one of five key factors for successful goal-focused workplace coaching identified by Grant (2003):

1. Coaching sessions that deliver an outcome which is of tangible value;
2. The development of a strong collaborative working alliance between coach and coachee;
3. An emphasis on constructing solutions, rather than merely analyzing the problem;
4. Efficient goal setting; and
5. Managing the coaching process over time and holding the coachee accountable for completing any agreed actions.

In other words, the coach’s role can be conceptualized as enhancing the *goal-directed self-regulation* of coachees. As Grant states (2003):

Goal-directed self-regulation consists of a series of steps in which an individual sets a goal, develops a plan of action, begins action, monitors his or her performance (through self-reflection), evaluated his or her performance by comparison to a standard (gaining insight), and based on this evaluation changes his or her actions to further enhance performance and better reach his or her goals. The coach’s role is to facilitate the coachee’s movement through the self-regulation cycle towards goal attainment (p.255).

This process is presented visually in Figure 2 as the generic model of self-regulation and goal attainment.

Grant and his colleagues at the University of Sydney have conducted a number of studies utilizing this model and measuring goal attainment as a dependent variable. One of the first such studies conducted found that a coaching program enhanced the mental health, quality of life, and goal attainment of participants (Grant, 2003). This study utilized a within-subjects research design with a sample of twenty adults recruited from a post-graduate institution. All subjects were exposed to the same condition: participants met for ten weekly group coaching sessions where they worked towards attaining a specific, tangible and measureable goal they had been previously unsuccessful in achieving. A *t*-test revealed that participation in the coaching program was associated with increased goal attainment, with a large observed effect size ($d = 2.85$; Cohen, 1992). Most recently, Grant, Curtayne, and Burton (2009) utilized a between-subjects

randomized controlled treatment (RCT) research design and found that coaching enhances goal attainment, resilience, and workplace wellbeing. This was the second RCT design used in the history of coaching research and involved a sample of forty one executives from a public health agency who experienced four individual coaching sessions. This was the first study to involve professional external coaches as well as the first study to find a significant effect due to coaching relative to a control group. A repeated measures analysis of variance (ANOVA) for goal attainment showed a significant time by group interaction effect, significant at the $p = .001$ level, indicating that participants' goal attainment significantly increased after coaching relative to a control group. Previously the impact of coaching on dependent variables such as goal attainment had not been parsed out, and therefore Grant et al. 2009's study represents an important advancement for the coaching outcomes literature.

Goal attainment as a key coaching outcome variable. Given the importance of goals in coaching, goal attainment becomes a key variable to those interested in measuring coaching outcomes. Goal attainment is defined in the literature as the degree to which goals are successfully achieved or realized by coachees (Spence, 2008). Greif, in his 2007 review of coaching outcomes studies, identified goal attainment as one of the outcome variables commonly measured. He classified goal attainment as a *general* coaching outcome variable, as opposed to *specific*, since it is not logically dependent on the specific problem, goal or type of intervention. Furthermore, Greif (2007) noted that goal attainment as a general coaching outcome measure is usually independent of the theoretical approach and assumptions of the authors. As such, Greif argues that this variable is versatile and may be applicable to a large range of coaching contexts as well as to other fields of interventions and evaluation research (e.g., training effectiveness, business consulting results, etc.). Indeed over the past ten years, goal attainment has been

measured by researchers conducting predictive studies of coaching outcomes (Brauer, 2005, 2006; Runde & Bastians, 2005) as well as researchers experimentally evaluating the outcomes of a coaching intervention (Willms, 2004).

For example, Brauer (2005, 2006) found that goal specificity and the quality of the coaching relationship predicted goal attainment among 92 participants receiving individual coaching. Runde and Bastians (2005) investigated the predictability of goal attainment using data from 67 police officers and found, using multiple regression analysis, that the quality of the coaching relationship was its the strongest predictor. Willms (2004) found that students participating in a self-coaching program significantly increased their goal attainment relative to a control group (N = 76). These participants were assigned randomly to the self-coaching or control group, matching pairs of subjects according to scores on a personality measure (NEOFFI). In both groups goal attainment was significantly predicted by persistence, and interestingly Willms (2004) suggested that certain self-regulation competencies, such as Goal Oriented Attention and Planning Ability (Kuhl & Fuhrmann, 1998), developed by the self-coaching program may be required for goal attainment. Overall, studies such as these demonstrate the track record that goal attainment has as a dependent variable in numerous coaching contexts, and suggest that further exploration of coaching techniques that enhance coachee's goal attainment are warranted. This study heeds calls for exactly such an exploration and will be detailed shortly, but first how goal attainment is measured merits discussion.

Measurement of goal attainment in coaching research. The measurement of goal attainment in coaching research has been accomplished via self-report tools (Spence, 2008). Procedures outlined by personal goal researchers, such as Emmons (1986) and Sheldon, Kasser, Smith, and Share (2002), typically start with participants recording a specified number of goals

in a personal workbook or questionnaire. Goal attainment ratings are then obtained in one of two ways (Spence, 2008). First, a pre-coaching goal attainment score is obtained by having participants rate their success on the goals they identified using a simple 5-point Likert scale (e.g., 1 = *0% successful* and 5 = *100% successful*). This score becomes the goal attainment score for Time 1, unless multiple individual goals are employed. If multiple individual goals are employed, these “Goal Success” ratings are then added and this total is subsequently divided by the total number of goals to obtain a mean attainment score for Time 1. This process is repeated post-coaching at Time 2, and possibly thereafter (Time 3, etc.) depending on the research design and possible follow-up interventions. Once a series of attainment scores have been compiled, data from multiple time points can be statistically analyzed to establish the impact of coaching on goal attainment. Both Green, Oades, and Grant (2006) and Spence and Grant (2007) employ this method.

Second, the method above can be extended by adding a “difficulty rating” that can be measured in a similar manner (e.g., on a Likert scale with 1 = *very easy* and 5 = *very difficult*). Goal attainment scores are calculated by asking participants to rate their success on a goal they identify (also known as their “Goal Success”) and then multiplying this number by a difficulty rating. The following equation summarizes this method of calculation: $\text{Goal Attainment} = (\text{Goal Success} \times \text{Difficulty})$. Note that, like the first method above, goal attainment can be measured in this way at multiple points in time (e.g., pre and post an intervention) in order to calculate an overall goal attainment change score.

Adding a difficulty rating is important because very difficult or very easy goals can skew the goal attainment change scores and lead to a misinterpretation of results. One participant’s goal attainment score may be very high because easy goals were set, while another participant’s

score may be very low since difficult goals were set. Without a difficulty rating participants' progress may be mistakenly attributed to another factor such as commitment or ability. Overall, by weighting each goal for its perceived degree of difficulty, this method becomes sensitive to change as goals with a high difficulty rating exert more influence on the overall goal attainment change scores than goals with lower ratings (Spence, 2008). Thus, if one participant rates their goal as 1 (*very easy*) and a second participant rates their as 4 (*very difficult*), and the same amount of progress is observed for both goals between two time points (e.g., a change in success rating from 50% to 75%), then a greater degree of attainment will be recorded for the second participant than the first, due to the weighting it has received. Figure 3 offers this example to illustrate and compare goal attainment change score calculations with and without the difficulty rating. Notice in the example that without the added accuracy a difficulty rating provides, a researcher may draw an erroneous conclusion, namely that the two participants achieved the same progress on their goal attainment over time. This method, documented by Spence (2008), is simple and easy to use and has been employed by in peer-reviewed published research such as Spence and Grant (2007) and Grant (2003).

The following study follows the procedure outlined above and utilizes difficulty ratings when calculating goal attainment change scores. In other words, this study's dependent variable, goal attainment, is calculated by having each participant identify one goal and rate their success and difficulty on this goal, at time 1 and time 2. More detail about this study's method is discussed in Chapter 3. The following section now discusses this study's independent variable, the Goal Attainment Scaling (GAS) interview technique.

GAS scaling as an intervention technique. GAS is an interview technique that helps individuals progress towards goals (Kiresuk, Smith, & Cardillo, 1994) and was originally created

for the mental health field by Kiresuk and Sherman (1968). As Schlosser's (2004) review notes, the GAS technique has a track record in numerous professional helping contexts including clinical interventions such as physical therapy, geriatric care, Alzheimer's rehabilitation, family-focused therapy, and mental health (Bailey & Simeonsson, 1988; Lewis, Spencer, Haas, & DiVittis, 1987; Rockwood, Graham, & Fay, 2002; Simeonsson, Bailey, Huntington, & Brandon, 1991; Stephens & Haley, 1991; Stolee, Stadnyk, Myers, & Rockwood, 1999). In addition, GAS has been utilized in occupational therapy (Ottenbacher & Cusick, 1993), pediatric and geriatric rehabilitation (Mitchell & Cusick, 1998; Stolee, Zaza, Pedlar, & Myers, 1999), psychotherapy (Shefler, Canetti, & Wiseman, 2001), and multi-disciplinary health initiatives such as the delivery of remote health services (Cox & Amsters, 2002). Overall, research has demonstrated the technique to be particularly useful in programs that set specific goals (MacKay & Lundie, 1998) and it is typically used as a clinical tool to help address the physical or psychological needs of clients (Spence, 2008).

Concretely, a GAS interview yields the creation of a GAS chart for the participant. An example chart was displayed previously in Figure 1 in Chapter 1 of this document, as were the exact steps a researcher takes to create such a chart during a GAS interview. It is important to note that when Spence (2007) introduced the technique to the coaching literature, he was proposing GAS be used to measure goal attainment as a *dependent* variable. In other words, he proposed GAS charts be used as an alternative to simple self-report measures of goal attainment (e.g., calculating goal attainment by multiplying 'success' and 'difficulty' scores, as this study intends to do). Spence (2007) demonstrated that GAS charts themselves can be used to numerically calculate participants' level of goal attainment pre and post a coaching intervention, and that this difference score can then be used to demonstrate the impact, or lack thereof, of a

coaching intervention. For example, in the chart listed in Figure 1, a numerical value of 5 can be assigned to represent “Best expected outcome,” 4 for “Better than expected outcome,” 3 for “Expected outcome,” 2 for “Less than expected” outcome, and 1 for “Worst expected outcome.” If the participant started at level 1 (e.g., “Worst expected outcome”) and by the end of the coaching intervention was at level 4 (e.g., “Better than expected outcome”) than a difference score of 4 minus 1, or 3, would represent the progress of the participant in attaining their goal. The progress of participants can thus be numerically quantified regardless of the types of goals they set.

This paper does not dispute that using GAS in this way has some advantages over simple self-report measures, despite GAS being more time-consuming and less efficient as Spence (2007) himself acknowledges. However, the focus of this study is not on GAS as an outcome variable, but rather of GAS as a process predicting outcomes. Therefore, evaluating the merits of calculating goal attainment scores using GAS are outside the scope of this study. Instead, this study focuses on whether the GAS chart-building process may itself facilitate a participant’s goal attainment. This study’s hypothesis is in fact an outgrowth of Spence’s (2008) study, where in his discussion of results and future research needs, he suggested: “[Future] research could further examine the motivational properties of GAS and its ability to act as a facilitator of goal attainment,” (p. 188). To date, no research has been found that directly examines GAS’s potential impact on participants’ goal attainment. However a number of studies tangentially address the issue by comparing participants in a GAS condition to participants in a no-GAS condition.

For example, Parilis (1995) dissertation study investigated the effects of GAS on self-efficacy, motivation, and performance by comparing GAS to the typical setting of challenging

goals in beginning college students. Results supported the hypothesis that GAS would reduce the negative effects of nonattained goals on self-efficacy, motivation, and performance. Burgee's (1995) dissertation case-study examined the impact of incorporating GAS scaling into a teacher-support team consultation model. GAS was found to have a facilitative effect on teacher's and consultant's integrity with regarding to monitoring and documenting students' outcomes, as well as with defining problems in behavioral terms and setting relevant student goals. Finally, as noted by Burgee (1995), the counseling literature has found that collaborative goal setting between counselors and clients using GAS results in greater client satisfaction, motivation and positive therapy outcome in comparison to clients in a no-GAS condition (Barbrack & Maher, 1984; Kiresuk, Smith & Cardillo, 1994; La Ferrier & Calsyn, 1978; Maher, 1981; Smith, 1976). In retrospect, as noted by Burgee (1995), these researchers reported that the use of GAS increased clients' motivation because clients became more aware of their responsibilities in counseling (Smith, 1976) and experienced the opportunity to determine the direction of counseling (Le Ferrier & Calsyn, 1978).

Whether or not GAS yields similar findings in a coaching context remains to be examined. Before this paper discusses literature explaining how and why GAS may facilitate goal attainment in a coaching context, a number of other important findings from previous GAS research are shared.

GAS research methodology considerations. When Spence (2007) introduced GAS and the above procedures to the field of coaching, he identified a number of best practice guidelines for use of the tool in this context. His guidelines were based on the comprehensive discussion offered by Lewis, Spencer, Haas, and DiVittis (1987) on applying GAS for research purposes.

These guidelines are offered below since they inform the procedures to be employed by this proposed study (Spence, 2008, p.152):

GAS psychometric properties improve if certain methodological requirements are met... Researchers are encouraged to minimize threats to internal validity by using control conditions (Schlosser, 2004), randomly assigning participants to groups after the completion of goal setting (Ottenbacher & Cusick, 1990), and ensuring that research staff are adequately trained in all aspects of goal scaling, such as the assessment of the initial attainment status (Cytrynbaum, Ginath, Birdwell, & Brandt, 1979; Shefler et al., 2001).

Furthermore, Spence (2008) indicated that separating the research component from the coaching component was important to safeguard against bias. In other words, the GAS researcher should not also be coaching participants. Having one person in both researcher and coaching roles could lead to a role conflict (Levinson, 1959) in that the researcher's interest is in measuring actual, objective results may conflict with the coach's interest in encouraging growth and goal-progress of coachees. Therefore, ideally the GAS chart is co-created by the researcher and participant, while a coach works with the participant on achieving and monitoring their goal. It is theoretically plausible for the coach to also participate in the GAS chart creation process, which may help ensure that realistic goals are chosen and may also help the participant transition from working with the researcher to working with the coach. However, to date no such practice has been documented in the literature, and given the additional coordination required this study will only involve researcher and participants in the GAS chart creation process.

Spence (2008) also offered a number of additional best-practices for the GAS process. Spence (2008) encouraged that realistic, meaningful, and specific goals be identified. Furthermore, the current level of attainment by coachees should be set at the "Less than expected" or "Worst expected" outcome levels of the GAS chart. As the example chart in Figure 1 illustrated, the current level of attainment, symbolized by the "(c)" was set at "Worse expected," which indicates that the participant at the start of the intervention was not initiating

any new conversations with any new people daily. These best practices are supported by research in the areas of goal-setting and control theory. These literatures indicate that initial goal levels are positively correlated with past performance and ability, and that future goals will typically be set at slightly higher levels than past performance levels (e.g., Campion & Lord, 1982). As such the GAS best practice that calls for setting current levels of attainment at low levels (e.g., “Less than expected” or “Worst expected”) allows for slight improvements in future performance to aligns with one’s typical aspirations.

A final best-practice identified by Spence (2008) is that GAS should be used with coachees in an “implementation mindset” rather than coachees in a “deliberative mindset.” These terms refer to mindset theory, which is one of the most prominent frameworks to emerge from motivational research examining the cognitive processes that support and maintain goal pursuit (Gollwitzer, 1990; Kruglanski, Shah, Fishbach, Friedman, Chun, & Sleeth-Keppler, 2002; Sorrentino & Higgins, 1986). This theory posits that successful goal pursuit requires the accomplishment of two important tasks: (1) choosing a goal and (2) implementing a chosen goal. Furthermore, a great deal of empirical research demonstrates that these two tasks activate two distinct mindsets, or cognitive procedures, called “deliberative” and “implementation” mindsets (summaries by Gollwitzer & Bayer, 1999; Gollwitzer, Fujita, & Oettingen, 2004). A deliberative mindset refers to the cognitive procedures associated with choosing a goal and is characterized by the careful examination of competing goals. For example, when individuals choose a goal to pursue they may deliberate between the many wishes and desires they may have, and often will focus their thoughts on issues goal desirability, feasibility, and other similar expectancy-value considerations (Fishbein & Ajzen, 1975). Once a goal is chosen, individuals shift their focus onto issues relating to implementation.

An implementation mindset refers to the cognitive procedures associated with planning and executing actions relevant to a chosen goal, and is characterized by a commitment to attain the goal and one's initial steps to move towards that goal. For example, individuals in this implementation mindset often focus their thoughts on when, where and how they will act in order to implement their goal (Fujita, Gollwitzer, & Oettingen, 2007). It was to these two research-supported concepts that Spence (2008) referred to when he suggested that GAS be used with coachees in an implementation mindset, rather than coachees in a deliberative mindset.

Spence (2008) explained:

Coachees in the ... deliberative mindset are unlikely to greet a GAS process with much enthusiasm since these coachees do not have a compelling reason to change. GAS is more likely to be effective when a client has decided to make a change... GAS is likely to provide a useful process for formulating realistic action plans and once formulated, the GAS chart may be a useful point of reference during implementation... and for sustaining effort (p. 155-156).

In other words, Spence (2008) suggested that GAS would be most effective with coachees in the implementation mindset since coachees in this mindset are interested in specifying how they will carry out their goal. On the other hand, Spence (2008) suggests that the GAS chart-making process may not appeal to coachees in the deliberative mindset since the process does not explicitly help a coachee decide which goal they should pursue.

Therefore, to account for this research and perspective, the following study instructed participants to pick a goal that they were motivated to pursue and ready to implement. These instructions sought to minimize the potential resistance from participants to the GAS process by focusing on goals that are associated with an implementation mindset. In other words, this study did not test whether GAS works best with an implementation mindset, as Spence (2008) suggested, but sought to create boundary conditions that facilitate participants' implementation mindset prior to their engagement in a GAS chart making process.

The creation of GAS charts according to the procedures and best-practices described above has a number of potential benefits to researchers, coaches and participants (Spence, 2008). First, GAS reduces self-report bias of participants by making goals observable and behavioral, and allows for more exact measurement of change. This process helps participants operationalize higher-order goals and allows them to see a range of outcome options. Furthermore, the process encourages collaboration between the participant and researcher since it requires a dialogue about the nature of the goal (e.g., its purpose and level of specificity), the goal's related behaviors (e.g., how to monitor progress), and potential outcomes (e.g., best expected versus worst expected). As a result of this conversation, participants can gain greater clarity, including how to better achieve their goal. Finally, making goals observable and behavioral may interest all parties vested in seeing and measuring coaching-driven progress, including researchers, coaches, and participants.

Contributions from Goal-setting Research and Control Theory

Since GAS is a goal-focused process, our understanding of why GAS is an effective intervention could benefit from the well-established research on goal-setting. Goal setting is a popular motivational technique firmly supported by approximately 40 years of field and laboratory experimentation (e.g., Champion & Lord, 1982; Locke & Latham, 2002). The following section summarizes this research and also discusses related conceptual models, including control theory (Carver & Scheier, 1981), to help explain why GAS works.

Goal specificity. The GAS interview process creates specific goals. As explained earlier, GAS charts identify outcomes for participants that range from “best expected” to “expected” to the “worst expected,” and each outcome must be specific and mutually exclusive. The chart may lead to an increase in goal attainment for participants partly because specific goals produce better

performance than ambiguous goals (e.g., “Do your best.”). For example, Locke and Latham meta-analysis (1990) found large effect sizes on performance, ranging from .42 to .80, favoring specific difficult goals over “do it your best” urgings. Additionally, GAS charts’ specific goals serve a *directive* function in that they direct attention and effort toward goal-relevant activities and away from goal-irrelevant activities. Such direction of attention is likely to increase goal attainment given that specific goals have been found to direct attention and improve performance in the goal setting literature. For example, goal specificity was found to reduce variation in performance by clarifying what is to be attained (Locke, Chan, Harrison, & Lustgarten, 1989). Locke and Bryan (1969) observed that people who were given feedback about multiple aspects of their performance improved their performance on the dimensions for which they had goals but not on other dimensions. Lastly, previous GAS research supports this direction-of-attention notion, as GAS research participants have agreed with the statement: “I find that that I ‘carry’ my goal charts around in my head,” indicating a belief that the chart helped them maintain a high level of awareness about their goal (Spence, 2008, p. 176).

Goal difficulty. GAS interviews also identify difficult goals. Research has found that high goals lead to greater effort than low goals on both cognitive tasks (Locke & Latham, 2002) and physical tasks (e.g., Bandura & Cervone, 1983). Hard goals prolong effort (LaPorte & Nath, 1976) and tight deadlines lead to a more rapid work pace (Bryan & Locke, 1967). Goal setting research has also found that difficult goals lead to greater persistence (Locke & Latham, 1990). Therefore, goals, and by extension GAS, serve an *energizing* function and affect *persistence*. Difficult goals lead to increased efforts and performance by setting a higher referent standard and creating a greater perceived discrepancy between the current state and the future desired state (Campion & Lord, 1982; Locke and Latham, 2002). The GAS process inherently creates difficult

goals for participants when the “best expected” outcome is identified. This helps ensure that the coachees are challenged by a difficult goal, increasing the likelihood that coachees increase their efforts and attain their goal. Previous GAS research participants have indicated their general agreement with the statement: “The goal chart helps me to stay motivated,” indicating that GAS charts may indeed energize and possibly encourage persistence among participants (Spence, 2008, p. 176).

It is important to note that difficult goals lead to increased effort and higher performance only when goals are realistic or attainable (Locke & Latham, 2002). If goals are beyond the capabilities of the goal-setter, lowering goals and changing strategies are likely consequences of goal-performance discrepancies (Campion & Lord, 1982). Experimental research has demonstrated that performance levels off or decreases only when the limits of ability were reached or when commitment to a highly difficult goal lapsed (Erez & Zidon, 1984). To help prevent limits of competence from interfering with participants’ attaining their goals, GAS best-practices require researchers to make certain that the “expected outcome” identified is not beyond the ability of the participant. This can be accomplished, for example, by researchers inquiring whether the goals articulated are realistic.

Performance feedback. GAS charts also provide a feedback mechanism for participants. Charts allow for progress to be observed on goals at any time with behavioral indicators ranging from “best expected” to “worst expected.” Goal setting research has demonstrated that specific goals, such as the ones detailed on GAS charts, improve performance because they permit more precise feedback from the environment and thus are clearer referent states (Locke & Latham, 2002). In other words, to be effective, people need feedback that reveals progress in relation to their goals. If people do not know how they are doing, it is difficult or impossible for them to

adjust their efforts or strategies. When people discover they are below their target, they typically increase their efforts (Matsui, Okada, & Inoshita, 1983) or try a new strategy. The fact that GAS charts provide participants with a range of specific goals and potential results, ranging from “worst expected” to “best expected,” means that the charts can feedback relative progress, or lack thereof, to participants. Further supporting the notion that GAS charts acts as referent states that feedback progress is the finding that GAS participants often agree with the statement that they “carry around” the chart in their “heads” (Spence, 2008).

Research has also demonstrated that goals with feedback have been shown to be more effective than goals alone (Locke & Latham, 2002). This may be explained by control theory (Carver & Scheier, 1981) and motivational control systems (Campion & Lord, 1982) which emphasize the importance of goal setting and feedback for motivation. Control theory explains that self-regulating systems, including individuals, seek to reduce discrepancy between current states and a desired state (also known as a referent state or value). For example, the participant who created the GAS chart in Figure 1 may seek to initiate new conversations once a discrepancy is noticed between their current level of attainment (e.g., no conversations with anyone new) and their desired goal of being more social. This aspect of control theory is also known as a “negative feedback loop,” since the *output* of the system (e.g., the behavior of the GAS participant) seeks to *reduce* the discrepancy between the current and desired states. Figure 4 displays this cyclical process of comparing the current state with the desired state, and labels this process as using a “comparator” between “input functions” (e.g., perceptions of the current state) and a “reference value” (e.g., the desired state). The figure illustrates that certain resulting behaviors may occur, labeled “output function,” as a result of this comparison. Control theory and motivation control systems argue that the *perception* of a discrepancy between the current

state and a referent value, or standard, is important, and whether or not that leads to corrective action depends on the individual and the environment. Either the current state will be modified with behaviors and/or cognitions or the referent itself will change (labeled “output function” and “referent value” respectively in Figure 4). In other words, continuing with the example from Figure 1, either the GAS participant will increase their number of social interactions to align with their goal of being more social, or alternatively the participant may change this goal. The goal, or referent standard, in this example may change for numerous possible reasons such as (1) the participant may not enjoy increasing the number of social interactions and thus abandoned the desired goal, or (2) the participant may learn from a coach that being introverted is normal and they don’t need to become more social. Coincidentally, in control theory terms, this information from the participant’s coach would be called a “disturbance” since it is something external to the participant which impacted the participant’s environment and perception of their referent standard. Regardless, control theory’s main contribution to this study holds: discrepancies inherent in all GAS charts create self-correcting motivation for participants to either pursue their goal or change it. This negative feedback loop concept also has important implications for coaching.

Grant’s generic model of self-regulation and goal attainment (2003), introduced earlier in Figure 2 to emphasize the importance of goals in coaching, has a remarkably similar structure to the negative feedback loop displayed in Figure 4. Both figures have a cyclical process at their core. Both figures also indicate that actions impact the environment, and that the results of these actions depend on perceptions of success. Success in Grant’s model results from monitoring progress and evaluating it, which according to control theory model is done by comparing the current state to a referent standard. This makes sense in a coaching context since coaching

conversations may result in a heightened awareness of the current state (Grant, 2003) and may elicit some desired future state, particularly if a goal setting process, such as GAS, is involved. Similarly, as stated previously, GAS charts also create referent values that are monitored and evaluated by participants as they enact or fail to enact specific goal-related behaviors.

Overall then, this review suggests compatibility between the “self-correcting” motivational concepts inherent in a negative feedback loop, Grant’s coaching model, and the GAS process. Given this potential synergy, the following study will seek to deepen understanding of the GAS technique by testing the potential motivational impact the technique may have on participants in a coaching context. Since both coaching and the GAS process may serve to motivate participants, parsing out the effects that GAS and coaching may individually have on goal attainment would be useful. For example, it is theoretically possible that GAS may be effective in facilitating goal attainment as a “stand-alone” intervention (e.g., without coaching) due to its ability to provide feedback to participants. It is also possible that coaching may significantly increase participants’ goal attainment above and beyond the effects of GAS. In other words, coaching may enhance participants’ goal attainment more than a GAS intervention does. Finally, coaching delivered in tandem with GAS may be more effective in facilitating participants’ goal attainment than either a GAS or coaching intervention could do alone. However, to date all of these possibilities remained empirically unexamined. The current study tested these possibilities, but before further elaborations are made regarding the study the following section submits one final additional explanation as to why GAS is likely an effective intervention.

Goal hierarchy. The GAS chart-creation process helps participants operationalize higher-order goals into lower-order goals (Spence, 2008). Higher-order goals are objectives that

are expressed at a vague, global level (e.g., “Become more social”). Lower-level goals are more definitive objectives that focus in on specific actions related to growth and development (e.g., “Increase number of social interactions to overcome shyness”). The GAS process assists participants to express their goals in lower-level terms and as specific behavioral units that are easily observable, measureable, and realistic (e.g., “Initiate conversations with two new people every day”). Spence (2008), the first researcher to apply GAS to a coaching context, used a GAS workbook with participants when conducting a number of empirical studies. This workbook included hierarchical diagrams to help participants move from articulating their goals at a higher order level to more specific lower order goals. An example diagram from Spence’s (2008) GAS workbook is displayed in Figure 5 and highlights the hierarchical relationship between higher-order goals and lower-order goals.

Modeling goals in a hierarchical fashion – that is, in a vertical progression from abstract, superordinate levels down into concrete, subordinate goals -- is common among goal setting researchers and theorists (e.g., Campion & Lord, 1982; Carver & Scheier, 1981; Chulef, Read & Walsh, 2001; Gallistel, 1980; Hacker, 1985). Research has further demonstrated that individuals may prefer to express their goals at various levels of abstraction (Emmons, 1992). In other words, some GAS participants when asked about a goal they intend to pursue may reply “Perform more acts of kindness,” while others may state “Volunteer every month at a Meals-on-Wheels shift.” Regardless of participant’s individual differences, Spence (2008) observed that there may be benefits to helping people understand how their goals fit together, as the diagram in Figure 5 illustrates. In particular, Spence (2008) noted that the GAS process allows “big picture” discussions about participant’s personal goal systems and can illustrate the degree to which their goals are congruent (i.e., reflect their values and interests) (Sheldon & Kasser, 1995). Whether

or not this discussion and illustration ultimately facilitates participant's goal attainment remains to be empirically examined.

Lastly, goal hierarchy may also relate to the concept of goal stability, which is defined as the degree to which the aspirations, intentions, and motivations driving goal pursuit remain steady or consistent (Spence, 2008). Goal instability has been identified as one of the challenges for goal setting research, including GAS methodology (Spence, 2008). In other words, participants' goals may change or evolve over time due to changes in aspirations, intentions, or motivation. As Spence (2008) notes, "For some this might as a consequence of changed personal circumstances (e.g., personal injury, occur job loss) or because an individual lacks commitment and is not appropriately energized towards...[their goal]" (p. 154). Furthermore, some researchers have suggested that higher-order goals may be more stable and less susceptible to change relative to low-order goals (e.g., Carver & Scheier, 1982). Regardless of the underlying reasons, changed goals are problematic since GAS charts cannot be changed without an additional interview and misguided conclusions may be made. For example, if a participant's goal changes, say because of new found insights, their goal attainment scores may in fact go down since the goal they originally identified and scaled on the GAS chart is no longer relevant. However, this does not necessarily mean the GAS process or coaching was ineffectual. Rather this is an indication that the participant's goal changed and that the GAS methodology has limitations.

Summary of Previous Research

To summarize, previous research from goal-setting and control theory literature suggests that GAS is a successful intervention technique because the chart-making process: (1) makes goals specific, (2) identifies difficult goals, while also providing a range of outcome options, (3)

provides feedback, and (4) transforms higher-order goals into lower-order goals that are behaviorally specific. Goal setting research has demonstrated that these characteristics lead to higher performance and suggests, as does previous GAS research, a hypothesis that the following study empirically examined: GAS may facilitate the goal attainment of participants. As Spence (2008) noted (p. 157):

The GAS process encourages expenditures of cognitive effort by a client. That is, setting specific and realistic goals requires a client to think clearly about what they want to achieve and how much they are capable of doing. As Locke (1996) has noted, there is overwhelming evidence that intensive cognitive processing is a major factor in successful goal attainment. Thus, the use of GAS in coaching seems sensible because increased self-reflectivity, the collaborative nature of the process and the formal agreement of goals, may all interact to stimulate goal-oriented cognitions (e.g. planning) and behaviour (e.g. monitoring), whilst enhancing goal commitment; other variables known to be important for successful self-regulation (Locke, 1996).

In other words, Spence (2008) hypothesizes that the GAS process may facilitate the goal attainment of participants through the stimulation of intermediary mechanisms including an increase in goal oriented planning and goal commitment. Similarly, after conducting a series of studies examining goals that utilized GAS methodology, Sheldon and Elliot (1998) suggested that “participants who undergo the GAS procedure might better attain their goals than participants who do not, because the procedures makes the goal representations more concrete and specific, easier to regulate and thus more attainable (Locke & Latham, 1990)” (p.555). To verify this, they suggested that the GAS procedure itself be used as an independent variable in subsequent research. Finally, in a review of GAS studies from other fields, including Burgee’s (1996) study on teacher-support consultation and Parilis’s (1996) dissertation on college student goal setting, Schlosser (2004) also concluded that GAS may act as a “facilitator of goal attainment” (p. 225). However, this core proposition and the potential underlying mechanisms, were untested.

To address this gap in the literature the following study tested the hypothesis that GAS increased the goal attainment of participants relative to participants who did not scale their goals. To increase the knowledge-base underpinning GAS and to examine the use of GAS in a coaching context, this study also compared the goal attainment of participants who received coaching in addition to GAS with the goal attainment of participants who received GAS without coaching. Since coaching can increase the goal attainment of participants (Grant et. al., 2009), it is important to separate the impact coaching may have had on goal attainment from the impact GAS may have had on goal attainment. Otherwise if coaching is used in tandem with GAS, as suggested recently by researchers (e.g., Spence, 2008), it will not be clear how the two interventions individually influence goal attainment or if the two interventions interact in influencing goal attainment. It is theoretically possible that GAS utilized in tandem with coaching facilitates goal attainment more than GAS used as a “stand-alone” intervention. It is also theoretically possible that GAS utilized in tandem with coaching facilitates goal attainment more than coaching alone. However these possibilities remained empirically unexamined.

Furthermore, despite GAS being recently introduced to the coaching literature by Spence (2007) and being utilized by a number of studies (e.g., Spence, 2008), it is still not a commonly used technique during coaching and its potential impact on goal attainment had not been empirically examined. If the following study is able to demonstrate that GAS does indeed increase participants’ goal attainment, and if this study demonstrates that coaching can enhance this effect, GAS may become a more utilized methodology in coaching. As discussed previously, the field of coaching needs more research-validated techniques (Grief, 2007) and given that coaching is a goal-focuses process (Grant, 2003), GAS has great potential in a coaching context (Spence, 2007).

Finally, this study was also the first study to explore *when* and *how* GAS may influence goal attainment. In other words, one of this study's goals was to identify mediators and moderators that may influence GAS's impact on goal attainment. The mechanism underlying GAS's potential influence on goal attainment had never been empirically examined in previous research and as such this study represents a unique contribution to the literature. To this end, the following section explores potential mediators, after which potential moderators will be discussed.

Potential Mediators

Perceived goal competence. This paper's discussion of control theory, Grant's coaching model, and the negative feedback loop emphasized the importance of participant *perceptions* when setting goals, receiving feedback, and ultimately attaining goals. Previous research also indicates that GAS may increase goal attainment for participants by improving a participant's *perceived goal competence*. Competence involves feeling that one can act effectively and bring about goals (Sheldon, Ryan, & Reis, 1996). People perceive themselves to be competent when they feel able to attain important outcomes (Sheldon et. al, 1996). The construct of perceived competence is similar to that of self-efficacy, which is defined as a feeling that one can bring about desired outcomes (Bandura, 1986). Several established theories of motivation have the concept of perceived competence (i.e., efficacy) as a central variable (e.g., Locke & Latham, 1990). Accordingly, when people perceive themselves as competent at a behavior that is instrumental to a desired outcome, they will be motivated to engage in that behavior (Williams & Deci, 1996). Perceived competence has been assessed in numerous studies and has been used to predict maintained behavior change and effective performance (e.g., Williams, Freedman, & Deci, 1998; Williams & Deci, 1996). For example, a study on management of glucose levels

among patients with diabetes found that perceived competence at carrying out the treatment regiment in turn predicted patients' glucose control (Williams et al., 1998). Similarly, the causal influence of perceived competence on improving academic related behaviors has been thoroughly demonstrated (Schunk & Pajares, 2005). Obviously, no amount of perceived competence can produce success when requisite skills and knowledge are absent. However, empirical evidence clearly indicates that motivation and ultimately goal attainment is significantly influenced by perceptions of competence (Elliot & Dweck, 2005). Therefore, of particular relevance to the following study is the question: what types of activities enhance perceived competence?

Previous research has demonstrated that perceived competence can be enhanced in numerous ways. Generally, activities that make information available about how to achieve a goal may result in enhancing a person's perceived competence (Bandura, 1986; Locke & Latham, 1990). Instructional strategies such as strategy training, goal setting, and progress feedback, have all been demonstrated to enhance perceived competence and ultimately improve performance (Schunk & Pajares, 2005). Furthermore, mental simulations in which people envision the steps they will take to achieve a goal have been shown to significantly improve performance in academic settings (Taylor, Pham, Rivkin, & Armor, 1998). Overall, the GAS process has many similar attributes to these activities. As discussed previously, GAS involves setting goals, envisioning steps, and providing progress-related feedback. Therefore, it is possible that the GAS technique process influences participants' perception of competence regarding their goals ultimately leading to higher goal attainment. However, this potential mediating variable of GAS on goal attainment had never been empirically tested and represents a unique contribution to the literature.

Planning. Another potential mediating variable of the relationship between GAS and goal attainment is planning. Planning is defined as a cognitive process that specifies the steps required to attain a goal (i.e., how, when, and where) as well as the potential obstacles that may impede the goal's attainment. Numerous studies have explored the role of planning in successful goal attainment, and research has demonstrated that simply the act of identifying a goal stimulates task-relevant knowledge (e.g., obstacles, opportunities) and strategies (Wood & Locke, 1990). For example, when a goal is new people engage in deliberate planning to develop strategies to enable attainment of these goals (Smith, Locke, & Barry, 1990). Furthermore, as cited previously, mental simulations in which people imagine the actual steps they will take to achieve a goal have been shown to significantly improve performance (Taylor et al., 1998). Similar results were found by Gollwitzer and Brandstatter (1997) who analyzed a goal intention, (i.e., writing a report about how the participants spent Christmas Eve) that had to be performed at a time when people were typically busy (i.e., during the subsequent two Christmas holidays). The results of this study indicated that research participants who specified when, where, and how one wanted to get started on this project were about three times more likely to actually write the report than those who did not. Overall, empirical research indicates that people who engage in more intensive cognitive processing regarding their goals and their plans to attain them are more likely to actually carry out the relevant actions than those who engage in less intensive processing (Gollwitzer, Heckhausen, & Ratajczak, 1990).

Therefore, this body of research suggests that the GAS technique may facilitate participants' goal attainment by stimulating the planning of participants. In fact, previous GAS research participants have indicated their agreement with the statement: "I seem to be planning my daily activities better these days" (Spence, 2008, p. 176). Therefore, this study tested the

notion that creating GAS charts may facilitate goal attainment by stimulating the planning of participants, which had never before been empirically examined.

Goal commitment. Another important variable that may mediate GAS's impact on goal attainment is goal commitment. Goal commitment has been a central concept in goal-setting theory since its inception and can be defined as one's determination to reach a goal (Locke & Latham, 1990). One of the key research findings is that commitment can have a positive, direct affect on performance (Erez & Zidon, 1984; Locke & Latham, 1990). For example, Locke & Shaw (1984) found a significant positive relationship between commitment and performance when participants competed for a small monetary prize on a perceptual speed task. It is also important to note that generally very hard goals, which lead to high performance, are often less accepted (e.g., lower commitment) than easy goals, which leads to low performance (Locke & Latham, 1990). Therefore finding ways to enhance commitment of participants to challenging goals is one of the keys to achieving high goal attainment. Since the GAS technique involves identifying specific and difficult goals, it is possible that commitment may mediate the impact of GAS on goal attainment. The critical questions therefore are *why* and *how* would GAS enhance the commitment of participants? Previous research offers potential explanations.

Two factors have been found to facilitate goal commitment: (1) the importance of goal outcomes and (2) the belief that one can attain the goal (i.e., perceived competence or self-efficacy) (Locke & Latham, 2002). There are numerous ways to demonstrate that a goal is important. Studies have shown goal commitment to be enhanced when a public commitment to a goal is made (Hollenbeck, Williams, & Klein, 1989), and when people receiving an inspiring vision or supportive behaviors from a supervisor (Latham & Saari, 1979; Ronan, Latham, & Kinne, 1973). Therefore, GAS may facilitate commitment among participants since the activity

asks participants to articulate a goal they intend to pursue “out loud” to the researcher. In other words, the GAS process demonstrates to participants that the goal is important by asking them to share their goals with the researcher and make a commitment to the goal. In addition, GAS best-practices encourage the researcher to enact supportive behaviors in the creation of a GAS chart and to set realistic and attainable goals with participants, which may help participants’ believe they can attain the goal (i.e., their perceived competence). Overall then the following study tested whether the GAS technique process facilitates participants’ goal commitment, ultimately leading to greater goal attainment.

Potential Moderators

Goal Self Concordance. Research has demonstrated that the motivation underlying people’s pursuit of self-set goals may predict their goal attainment (Sheldon, Arndt & Houser-Marko, 2003). Specifically, if goals are “self-concordant,” that is if they largely express participants’ enduring interests and values, they are more likely to attain them (Sheldon & Elliot, 1998). Goals are self-concordant when participants identify more strongly with autonomous reasons for pursuing a goal than controlled reasons (Sheldon & Elliot, 1998). Autonomous reasons indicate that goals are undertaken with a sense of full willingness and choice, while controlled reasons indicate that goals are felt to be compelled by internal or external forces or pressures (Sheldon & Elliot, 1998). Studies have demonstrated this distinction important when people self-set goals and the content of goals is unconstrained, as is the case in the current study.

For example, in a series of three studies Sheldon and Elliot (1998) found that autonomous motivation for goals positively predicts successful attainment, while controlled motivation does not. Autonomous motivation is motivation that is characterized by primarily autonomous reasons of goal-pursuit, while controlled motivation is characterized by primarily controlled reasons of

goal-pursuit. The studies, one of which incidentally included GAS, consistently found this result across three different samples, across concurrent and prospective methodologies, and across short-term and long-term personal goals. Furthermore, the positive effects of autonomous motivation was found to influence goal attainment even when participant's commitment, perceived competence and the interaction between these two variables (Competence X Commitment) was controlled. To explain the results these researchers theorized that autonomous goals were pursued for two reasons. First, autonomous goals may be pursued for intrinsic reasons, which by definition are interesting and enjoyable (Deci & Ryan, 1985), and thus likely to be self-energizing (Omodei & Wearing, 1990). Second, autonomous goals may also be pursued because they were aligned with participant's enduring values and beliefs. Such alignment may help goals remain personally salient for participants, and continue to receive effort even if pursuing them is hard work and not enjoyable. In fact there is evidence that self-concordant goals do lead participants to exert more sustained effort towards achieving their goals, ultimately resulting in greater goal attainment (Sheldon & Elliot, 1999). Controlled motivation for goals, on the other hand, are pursued by definition without a full sense of ownership (Ryan, 1995), may be characterized by anxiety and guilt, and thus may be more vulnerable when frustration or setback occur (Sheldon & Elliot, 1998).

Overall then, a goal's self-concordance, the degree to which the goal pursuit is driven by autonomous versus controlled reasons, may moderate the impact of GAS on goal attainment. Since self-concordant goals are more likely to lead to sustained goal pursuit efforts, participants who choose self-concordant goals may in fact achieve higher goal attainment over time irrespective of the GAS intervention. Furthermore, it is possible that participants who choose self-concordant goals will enjoy the GAS process, which is essentially a planning discussion

about their goal, more since self-concordant goals are aligned with their values and beliefs. However, it is also possible that participants who choose goals that are less self-concordant may benefit more from the GAS process than participants who choose goals that are highly self-concordant. Participants who are obliged to achieve goals that are not aligned with their values may not be motivated to invest time planning how they will achieve their goal, which the GAS process requires. As discussed previously research has demonstrated that people who spend more cognitive effort planning their goals are more likely to attain them (Gollwitzer et al., 1990). To date, these potential linkages between Goal Self Concordance, GAS, and goal attainment have not been examined empirically and would represent a contribution to the literature.

Conscientiousness. Another variable that may moderate the impact of GAS on goal attainment is a participant's conscientiousness. Conscientiousness is one of the Five-Factor-Model personality traits (Costa & McCrae, 1992) and is defined as having a propensity for planning, organizing, carrying out tasks, being reliable, purposeful, strong-willed and determined (Costa & McCrae, 2002). Out of the multitude of personality variables, conscientiousness "may be the most important trait-motivation variable in the work domain" (Barrick Mount, & Strauss, 1993,, p. 721) and researchers have suggested that the trait might be the most appropriate variable to examine in studying the role of individual differences in goal setting (Kalnbach & Hinsz, 1999; Klein & Lee, 2006). This may be because personality is a distal predictor of performance and affects behavior by influencing proximal self-regulatory mechanisms such as goal setting (e.g., Barrick et al., 1993; Klein & Lee, 2006). Meta-analytic findings provide further insights regarding the impact of conscientiousness on performance and goal-setting.

Meta-analyses have found conscientiousness to be a consistent predictor of job performance (Stewart, Palmer, Wilkin, & Kerrin, 2008), suggesting that conscientious

individuals may be more likely to attain goals than non-conscientious individuals. Similarly, Hurtz and Donovan (2000) and Mount and Barrick (1995) meta-analyses demonstrated the positive relation between conscientiousness and performance. In relation to goals, Judge and Ilies (2002) found after analyzing 150 correlations from 65 studies a true score correlation of .22 between conscientiousness and goal setting level or difficulty. In other words, the more highly conscientious an individual is the more ambitious they are in setting challenging goals. As discussed previously, more difficult goals lead to increased effort and higher performance when the goals are also realistic and attainable (Locke & Latham, 2002).

Furthermore, conscientiousness was found to relate to goal commitment, which as explained previously has been found to significantly impact goal attainment (Locke & Latham, 2002) and is thus another key variable in the current study. Individuals high in conscientiousness are diligent and persistent, and as such they are also likely to be highly committed to their goals (Klein & Lee, 2006). Colquitt and Simmering (1998) found conscientiousness to be positively related to goal commitment, while Klein & Lee (2006) and Barrick et. al. (1993) both found that commitment fully mediated the effects of conscientiousness on performance. The finding that conscientiousness may affect performance through an individual's commitment to their personal goals (Barrick et al., 1993; Klein & Lee, 2006) suggests that a primary reason why individuals high in conscientiousness tend to perform at higher levels is due to greater levels of determination and persistence exhibited through goal commitment (Klein & Lee, 2006).

This body of research has a number of potential implications for the following study. First, given their natural proclivities for planning and being strong-willed, it is possible that highly conscientious individuals may achieve their goals regardless of whether they utilize a GAS process or not. On the other hand, individuals who are not highly conscientious may find

the GAS process enhance their goal attainment given that the process encourages planning and possibly commitment, which may not come as naturally to these individuals. Ironically, these findings also suggest that even though conscientious individuals may not need GAS to enhance their goal attainment, they may nonetheless find GAS's planning process appealing since the orderly process is more in-line with their personality. However, these potential linkages had never been empirically examined, and as such represent potential contributions to the literature.

Current Study and Hypotheses

Literature has been reviewed to establish the possibility that the GAS technique may result in the increase of goal attainment for participants, as has been theorized by numerous empirical researchers (e.g., Schlosser, 2004; Sheldon & Elliot, 1998; Spence, 2007). This assertion had never been empirically examined despite the technique's long track record in various professional helping settings (Schlosser, 2004) and its utilization in various goal-setting studies (e.g., MacKay & Lundie, 1998; Sheldon & Elliot, 1998), and as such, testing this possibility is a unique contribution of this study to the literature. To do so, the following study used a randomized controlled between-subject design to compare the goal attainment over time of participants who scaled their goals according to GAS best-practices (Spence, 2008), with participants who do not scale their goals. As discussed previously, and as illustrated in Figure 3, the following study incorporated a difficulty rating in the measurement of participants' goal attainment over time in order to increase the study's precision. Furthermore, in line with previous research this study tested the impact of GAS by measuring goal attainment at two points in time (e.g., Spence & Grant, 2007): immediately before the intervention was implemented with participants and four weeks later. The longitudinal aspect to the study gave participants time to pursue their goals and allowed for a comparison of changes in goal attainment scores between

participants who used the GAS technique with those who did not. Overall, this study hypothesized that participants who experienced the GAS technique would have greater goal attainment than participants who set goals without the GAS technique over time. This core hypothesis is displayed visually in Figure 6.

Hypothesis 1: Participants who scale their goals with the GAS technique will achieve higher goal attainment than participants who do not scale their goals over time.

Furthermore, given that coaching is often conceived as a goal-focused process (Grant, 2003) in that coaches helps participants achieve goals (International Coaching Federation, 2011), the current study also sought to contribute to the growing body of coaching outcome literature that suggests coaching enhances goal attainment (e.g., Grant et al., 2009; Willms, 2004). The study's between-subject randomized control design was also able to test the hypothesis that over time participants who experienced coaching achieved higher goal attainment change scores than participants who were not supported by coaching. This additional hypothesis is displayed visually in Figure 7.

Hypothesis 2: Participants whose goals are supported with coaching will achieve higher goal attainment change scores than participants whose goals are not supported with coaching.

Given that both coaching and GAS potentially enhance goal attainment, the following study sought to parse out the influence of each intervention by examining whether or not the GAS technique yields greater goal attainment over time in a coaching context versus a non-coaching context. In other words, this study examined whether or not GAS used in tandem with coaching was significantly more effective in enhancing participants' goal attainment than if either coaching or the GAS technique were used as "stand-alone" interventions. To date no research had been found that examines this possibility. As reviewed earlier, GAS was introduced to the coaching literature recently (Spence, 2007) and this body of literature, while growing

(Grant, 2011), is still lacking in rigorous experimental research designs and validated instruments and techniques (Greif, 2007). By testing the GAS technique's potential impact on goal attainment in a coaching context, this study addressed calls by coaching researchers for evidence-based techniques (Greif, 2007) and examined Spence's (2008) suggestion that GAS "appears well suited for coaching" (p. 156).

Overall then, this study made the following hypothesizes regarding potential interactions between GAS and coaching. First, participants who experience GAS in tandem with coaching will achieve higher goal attainment change scores than participants who experience GAS without coaching. Second, participants who experience GAS in tandem with coaching will achieve higher goal attainment than participants who only receive coaching.

Hypothesis 3a: Participants who experience the GAS technique while being supported by coaching will achieve higher goal attainment change scores than participants who experience the GAS technique without coaching.

Hypothesis 3b: Participants who experience the GAS technique while being supported by coaching will achieve higher goal attainment change scores than participants who experience coaching without the GAS technique.

On the whole, this study made another important contribution to the literature: exploring *how* and *when* GAS may positively influence the goal attainment of participants. Goal-setting literature was reviewed (e.g., Locke & Latham, 2002) to determine possible mediators and moderators influencing GAS's potential impact on goal attainment. Specifically, three potential mediators (perceived competence, planning, and goal commitment) and two potential moderators (Goal Self Concordance and conscientiousness) were identified. Figure 8 models the potential mediating and moderating variables in a coaching versus non-coaching context.

As discussed previously, research on goals suggests that GAS's impact on goal attainment may be mediated by participants' perceived goal competence (e.g., Sheldon et al.,

1996). The GAS interview process, by helping participants envision concrete and realistic behaviors necessary to reach goals, likely enhances participants' perception of competence regarding their goals ultimately leading to higher goal attainment. As such this study hypothesized that the perceived goal competence of participants who experience a GAS technique will be higher than participants who do not scale their goal.

Furthermore, since research has demonstrated that motivation and ultimately goal attainment is significantly influenced by perceived competence (Elliot & Dweck, 2005), this study hypothesized that participants with higher perceived goal competence will achieve higher goal attainment change scores than those with lower perceived goal competence.

Hypothesis 4a: Participants who experience a GAS technique will have higher perceived goal competence than participants who do not experience a GAS interview.

Hypothesis 4b: Participants with higher perceived goal competence will achieve higher goal attainment change scores than participants with lower perceived goal competence.

Additionally, previous goal-setting research suggests GAS's impact on goal attainment may be mediated by goal-planning. As discussed previously, people who engage in more intense planning are more likely to attain their goals (Gollwitzer et al., 1990). Given that the GAS-chart creation process is fundamentally a process that stimulates goal planning, it is likely that participants who experience the GAS process will spend more time and cognitive effort planning their goal than participants who do not experience the GAS process. To examine this possibility, this study measured planning as a potential mediating variable and hypothesized that participants who experience GAS will do more planning to achieve their goal than participants who do not experience a GAS technique. Furthermore, given previous research findings, this study also hypothesized that participants who do more planning will achieve higher goal attainment over time.

Hypothesis 5a: Participants who experience a GAS technique will do more planning than participants who do not experience a GAS technique.

Hypothesis 5b: Participants who do more planning will achieve higher goal attainment change scores than participants who do less planning.

As discussed previously, goal-setting research (e.g., Locke & Latham, 2006) also suggests that goal commitment may mediate the impact of GAS on goal attainment. The GAS process may enhance participants' commitment to their goals by (1) requiring participants to identify a goal they intend to pursue "out loud" with the researcher, and by (2) enhancing participants' belief that they can achieve their goal since the GAS process supports participants in identifying realistic and attainable goals. As such, the following study hypothesized that participants who experience the GAS technique will have greater commitment to their goals than participants who do not experience the GAS technique. Furthermore, the study hypothesized that participants with greater commitment will achieve higher goal attainment change scores than participants with lower commitment.

Hypothesis 6a: Participants who experience a GAS technique will be more committed to their goals than participants who do not experience a GAS interview.

Hypothesis 6b: Participants with higher commitment will achieve higher goal attainment change scores than participants with lower commitment.

Additionally, research has demonstrated that a goal's self-concordance (Sheldon & Elliot, 1999) may moderate the impact of GAS on goal attainment. As discussed previously, GAS may actually benefit participants choosing goals that are not self-concordant more than participants choosing goals that are self-concordant since the GAS process requires planning, which these participants may not naturally be inclined to do on their own. In other words, this study hypothesized that over time GAS will likely improve the goal attainment of participants who choose goals with low Goal Self Concordance more than it improves the goal attainment of

participants who choose goals that are highly self-concordant. Furthermore, the following study hypothesized that among participants that chose goals with low self-concordance, participants who experience a GAS intervention will achieve greater goal attainment over time than participants who do not experience GAS. Similarly, the following study hypothesized that among participants that choose goals that are highly self-concordant, participants who experienced a GAS intervention will achieve greater goal change scores than participants who did not experience GAS. However among highly self-concordant participants this positive change in goal attainment scores will likely be smaller since these participants will likely achieve their goals irrespective of GAS.

Hypothesis 7a: GAS will improve the goal attainment change scores of participants with low Goal Self Concordance more than for participants with high Goal Self Concordance.

Hypothesis 7b: The goal attainment changes scores of GAS participants with low Goal Self Concordance will be higher than scores by No-GAS participants with low Goal Self Concordance.

Hypothesis 7c: The goal attainment changes scores of GAS participants with high Goal Self Concordance will be slightly higher than scores by No-GAS participants with high Goal Self Concordance.

Finally, as reviewed previously, meta-analyses on personality and work performance (e.g., Hurtz and Donovan, 2000) suggest that conscientiousness may moderate GAS's impact on goal attainment. There are a few potential implications to the current study based on the research reviewed. First, highly conscientious individuals may achieve greater goal attainment relative to less conscientious individuals regardless of whether they experience a GAS technique. This may be because highly conscientious individuals are more committed to their goals, as previous research findings have discovered (e.g., Klein & Lee, 2006). Furthermore, less conscientious individuals may benefit more from the GAS process given that orderly planning and being strong-willed are not their natural strengths. Finally, given that highly conscientious participants

often achieve their goals, this study anticipated a relatively small improvement in goal attainment change scores when comparing highly conscientious participants in GAS and No-GAS

conditions. Overall, therefore the following hypotheses were proposed in the current study.

Hypothesis 8a: Participants in the No-GAS condition who are highly conscientious will achieve higher goal attainment change scores than participants in the No-GAS condition who are less-conscientious.

Hypothesis 8b: The goal attainment changes scores of GAS participants with low conscientiousness will be higher than scores by No-GAS participants with low conscientiousness.

Hypothesis 8c: The goal attainment changes scores of GAS participants with high conscientiousness will be slightly higher than scores by No-GAS participants with high conscientiousness.

Chapter 3: Methodology

The following chapter details the exact methodology utilized by this study. It includes an explanation of the study's design, including a description of participants, the recruitment process, and a number of important considerations regarding the coaches. The chapter also details the procedure employed in each condition, particularly the manipulations inherent to the goal attainment scaling (GAS) conditions, and the measures utilized.

Design

To examine GAS's potential influence on goal attainment in a coaching context, the following study utilized a 2 x 2 between-subjects research design using GAS (yes versus no) and Coaching (yes versus no) as the two independent variables. This design is diagramed in Figure 9. The dependent variable, participants' total goal attainment, was assessed via two telephone interviews with the researcher. Details regarding the exact procedure utilized in these interviews follow this overview of the design and participants. For now, it is important to note that participants were randomly assigned to the GAS condition, but not the Coaching condition. This is due to limitations inherent to this study's sample, which are now explained.

This study had two groups of research participants: current students and prospective students of the coaching certification program offered by the Hudson Institute of Santa Barbara, headquartered in California. Current students of the program, which lasts eight months, receive 15 hours of coaching as part of the school's standard educational curriculum. Prospective students of the school's program were recruited for this study to comprise the non-coaching condition. Prospective students had completed a one-day workshop at the Hudson Institute, which is a prerequisite for the coaching certification program. Overall then, the school's current and prospective students are a convenience sample to conduct coaching research.

The initial plan for this study was that the current students of school would comprise the coaching condition of this study, while prospective students would comprise the non-coaching condition, since presumably prospective students are not receiving coaching. As the study commenced, this assumption proved true for most, but not all of the prospective students. Eight prospective students, out of the 25 successfully recruited, were in fact receiving coaching. Rather than disqualifying their participation and reducing this study's sample size, the eight prospective students were included in the coaching condition of the study. Further description of the study's participants, including a comparison of the two Coaching groups (yes versus no), is provided below.

Participants. Fifty subjects were recruited for this study, which included approximately 25 current students and 25 prospective students. Fifty subjects completed the Time 1 interview with the researcher, while 48 subjects completed the Time 2 interview. Thus, the sample size for this study is 48. Demographic data for the overall sample is provided in Table 3. Overall, the average age of participants was 54 years with a standard deviation of nearly 7 years. The group was slightly more female than male (56% versus 44%), mostly Caucasian (90%), and the majority of participants were fully employed (73%).

Table 4 compares the demographic data of the two Coaching groups (yes versus no). Overall, participants in both groups share a number of characteristics including similar employment backgrounds (e.g., approximately 10-15 years of professional management experience) and demographic characteristics. Specifically, the average age of participants in the coaching group was 51 years, while participants in the non-coaching group averaged 55 years. Participants in the coaching group were 91% Caucasian, while participants in the non-coaching group were 88% Caucasian. 75% of participants in the coaching group were fully employed,

while 69% of participants in the non-coaching group were fully employed. 50% of participants in the coaching group were female, while 62% of participants in the non-coaching group were female.

Individuals in both groups also share an interest in the field of coaching and an interest in developing themselves professionally. Since 75% of participants in the coaching condition are current students in the Hudson program, which is time-intensive and rigorous, this group of participants overall has greater interest and availability for these pursuits. Given their additional training, the current students also likely have a deeper working knowledge of the process of coaching relative to prospective students.

Overall, despite not having an even distribution of current and prospective students in each Coaching condition (yes versus no), the groups are approximately equivalent on many characteristics. The comparison of GAS's impact on changes in each group's goal attainment is a convenient method of testing the technique's efficacy and underlying mechanism in a coaching context.

Participant recruitment. The executive director of the Hudson Institute made an appearance during regularly scheduled classes to inform current students of the opportunity to participate in this coaching research study. She said the following approximately:

“In keeping with our commitment to continual learning and evidence-based practice, the Hudson Institute will be researching coaching outcomes in partnership with Yaron Prywes, PhD candidate at Teacher's College, Columbia University's program in Social-Organizational Psychology. Specifically, the investigation will examine factors that support coachee's attainment of goals during coaching. Since goals play such a large role in coaching, further our understanding of goal attainment would be an important advancement to the field. I encourage you to participate in the study, which involves having two phone conversations with a coaching researcher who has expertise in goal-setting. You can expect to discuss with the researcher a goal you are interested in pursuing over the course of the next four weeks or so. I hope that you do choose to participate, however there will be no negative consequences to your student status if you

do not. Those interested in participating should e-mail the researcher directly at yp2002@columbia.edu to set up their telephone interview. ”

The director also e-mailed potential participants this study’s research recruitment flier, displayed in Appendix 1. As noted earlier, potential participants include current and prospective students of the school’s coaching certification program. Note that prospective students did not receive an in-person invitation from the director of the institute given that they are not physically present at the school on a regular basis, but received a similarly worded e-mail invitation.

Finally, once any current or prospective student indicated their interest in participating in the study, they received an e-mail from the researcher informing them of their rights as research participants and an informed consent document. Appendix 2 contains these forms.

Coach experience, recruitment, and approach. The experience level of coaches may affect this study’s results. For example, it is possible that participants who are coached by highly experienced coaches will achieve greater goal attainment than participants coached by inexperienced coaches. Similarly, the number of hours participants spend being supported by their coach may affect their goal attainment change scores. As such, the following study measured both the coaches’ experience (e.g., years in practice) and total coaching hours received, as control variables.

As stated earlier, current students receive coaching as part of their educational experience at the Hudson Institute. Current students typically interview a number of Hudson certified coaches before picking one to work with. Regardless of whom they pick as their coach, Hudson certified coaches utilize a similar method of coaching, which is illustrated in Appendix 3. This process has five steps: contracting, understanding the current situation, identifying obstacles, executing the plan, and concluding the coaching engagement. Within this process, the coach is required to carefully outline desired goals that will help move the coachee towards a desired

future state. Coaches are expected to support coachees by providing insight, including insights into what's working and what's not. In that sense, the process is similar to Grant's generic model of self-regulation and goal attainment discussed previously in Chapter 2 and displayed in Figure 2.

As discussed previously, eight out of the thirty-three participants in the coaching condition were perspective students of the Hudson Institute. It was determined that all but one of these participants utilized a coach certified by the Hudson Institute to support their goal attainment. Overall, having research participants receive coaching in a relatively uniform manner helps minimize the study's random error and may help prevent non-significant results from occurring. As Grief noted (2007, p. 238), "In future research it might be necessary to analyze and control the coaching process for deviations from the coaching concept, which is implicitly assumed." In other words, if coaches employ vastly different coaching processes, the resulting goal attainment scores may be due to the coaching technique rather than the GAS intervention. The current study's design, while not perfect, helps minimize this issue.

Procedure

Research participants were interviewed over the telephone to determine a goal they were motivated to pursue and implement over the course of approximately four weeks. Their current attainment on this goal is assessed during a first telephone interview, and their goal attainment is reassessed during a post-test, second telephone interview. Goal attainment change scores are calculated in accordance with procedures discussed previously and illustrated in Figure 3.

In order to determine the impact of GAS on goal attainment change scores within a coaching context, this study created four conditions: (1) participants create a GAS chart and receive coaching (2) participants create a GAS chart and do not receive coaching, (3) participants

do not create a GAS chart and receive coaching, and (4) participants do not create a GAS chart and do not receive coaching. Table 5 lists the pretest and posttest variables that are assessed in each condition via telephone interview. As the table illustrates, the three mediating variables (perceived competence, planning and commitment) were assessed during the first telephone interview and the remainder variables, including the two moderators (self-concordance and conscientiousness), were assessed during the second telephone interview. Note that during the first interview in the GAS condition, goal attainment and the mediating variables were assessed *after* the GAS chart was created so that the potential impact of GAS on these variables could be assessed.

In preparation for their first telephone interview, participants in all conditions received an email asking them to think about a goal they are motivated to pursue and are interested in implementing over the course of approximately four weeks. Participants who are receiving coaching were asked to pick a goal for this study that aligns with the work they are doing with their coach. This procedure was in place to prevent participants in the coaching condition from picking a goal that they are not receiving coaching support around, which is technically what the no-coaching condition is reserved for. Furthermore, participants in the coaching condition are encouraged to share their goals, and GAS charts when applicable, with their coach. These procedures allow a comparison of the impact GAS may have on goal attainment in a coaching context versus a non-coaching context.

The rationale for a four week time frame deserves explanation. Generally a field experiment studying goals and coaching must identify a time frame that avoids problems at either extreme – that is, a time frame that is too long or too short. Four weeks is likely long enough to give participants an opportunity to attain their goal regardless of the type of goal they

chose (e.g., speak more often during meetings, schedule more networking lunches). For the participants in the coaching condition this time frame also gives them the opportunity to receive two or three coaching sessions in support of their goal. Previous research has demonstrated that short-term coaching interventions ranging from one session to four sessions can be effective (Burke & Linley, 2007; Grant et al., 2009). According to the Hudson Institute, current students typically receive coaching once every two or three weeks. Therefore, the number of coaching sessions participants in the coaching condition experience throughout the duration of the study was assessed. Furthermore, all participants were asked during the second interview whether or not they had an opportunity to attain their goals.

Importantly, a four week time frame is also short enough to reduce the risk that participants' goals change, or naturally evolve, over time. As discussed previously, goal instability has been identified as one of the challenges for goal setting research, including GAS methodology (Spence, 2008). While there is no way to ensure stability of participants' goals over time (Spence, 2008), it stands to reason that the more time that passes the greater the risk that a participant's goal may change. Overall, a four week timeframe appears to strike a reasonable balance: long enough to give participants opportunities to attain their goals while not so long that participant goals become highly susceptible to change.

Therefore, during the second telephone interview participants were also assessed the degree to which their goal remained stable over the four week timeframe. During this posttest interview, participants in the GAS condition were also assessed regarding their perceptions of the GAS process. At this time participants with exemplary goal charts were also be asked if their personal goal charts can be displayed in the results or discussion of this paper, or shared with others.

Confidentiality. All research participants were informed that all data collected during the research interview would not be shared with anyone without identifying information first being deleted and names being changed (i.e., pseudonyms). Participants in the GAS condition were asked permission for their goal chart to be shared as examples for future research with their names being changed or deleted. Only goal charts that receive permission from participants and have been modified to conceal identity have been shared (e.g., publications).

Aggregate data is reported in this dissertation, and may be published in the future. Aggregate data has also been shared with the Hudson Institute of Santa Barbara, whose student sample was used to collect data. Reporting “aggregate data” means that the sample’s overall goal attainment is calculated and documented, but no individual’s names or goal attainment is reported. Using aggregate data in this way, as well as the use of pseudonyms and participant-permissions, minimizes the risk of data collected being identified with an individual participant.

These procedures were put into place in order to protect the privacy of research participants. All data was gathered via two telephone interviews (Time 1 and Time 2), which were made from a private location. As part of the interview protocol, the researcher made certain that no other people were present when making phone calls to participants, so that the conversations would not be overheard. Phone calls were not taped or recorded in any way. Data collected from interviews were kept in the researcher’s locked file cabinet which is locked at all times.

GAS condition. GAS charts were created following the steps outlined by previous researchers (Ottenbacher & Cusick, 1990; Spence, 2008). First participants identified a goal they were interested in and motivated to pursue over the course of four weeks. As explained previously, participants in the coaching condition were encouraged to pick a goal that aligns with

the work they are doing with their coach. All participants reviewed the example goal hierarchy chart displayed in Figure 5 and an example GAS chart displayed in Figure 1. With the examples and researcher guiding them, research participants articulated their goal in higher-order and lower-order terms. Their goal was reduced into specific, observable, and reportable behaviors that would indicate progress toward goal attainment. The participant and researcher then appraised and agreed on an “Expected Outcome” level of attainment that is both meaningful and realistic for the participant to accomplish given their history and the upcoming four week time frame. Next alternative levels of attainment were identified in order to quantify greater and lesser levels of performance. Overlapping goals and gaps between levels of attainment were then reviewed. Gaps between levels are not permissible and were addressed by defining a behavioral range for each goal level. Finally, participants’ current level of attainment was ascertained. An example illustrating the creation of a GAS chart following these procedures was offered in Figure 1 of Chapter 1 with a participant seeking to become “more social” by increasing the number of social interactions (e.g., conversations) with new people daily.

Once a GAS chart was created by following the above procedure, the researcher emailed the participant a copy of their chart and encouraged them to print and display the chart in an appropriate location (e.g., near their desk). For participants receiving coaching, the researcher encouraged the participants to share the chart with their coach. Once a week, a short reminder email was sent to participants regarding their goal. During the second telephone interview participants’ level of attainment was reassessed according to the outcome criteria identified by participants’ charts. Finally, participants’ level of Conscientiousness and Goal Self Concordance was determined by administering a short questionnaire orally.

No-GAS condition. Participants in the no-GAS condition were not exposed to the GAS chart creation procedure described previously. Instead participants in this condition simply identified a goal they were interested in and motivated to pursue over the course of four weeks. Once a participant articulated their goal, it was reiterated to the participant by the researcher to ensure accuracy. As explained previously, for participants receiving coaching the researcher encouraged choosing a goal that aligned with the work they were doing with their coach and, once identified, they were encouraged to share this goal with their coach. Once a week, a short reminder email was sent to participants regarding their goal. During the second interview, participants' level of attainment was reassessed. Finally, participants' level of Conscientiousness and Goal Self Concordance was determined by administering a short questionnaire orally.

It should be noted that another difference between these two conditions was the brevity of the no-GAS condition relative to the GAS condition. This difference creates an alternative hypothesis, namely that participants in the GAS condition increased their goal attainment more than participants in the no-GAS condition since they received more time and attention from the researcher. However, previous research comparing GAS to other techniques, such as typical setting of challenging goals (Parilis, 1995), also share this limitation. Given the time-consuming nature of creating GAS charts, this research vulnerability may be unavoidable.

Measures

Each of this study's measures is explained below, and a list of each variable's corresponding items is presented in Appendix 4.

Goal attainment change score. This variable was measured using a method employed by numerous coaching researchers (e.g., Grant, 2003; Spence & Grant 2007; Spence 2008). First an individual goal is identified by asking participants, "Please identify a goal you are motivated

to pursue and are ready to implement over the next four weeks.” This goal is then recited back to the participant to ensure accuracy. Next participants’ current success is measured by asking, “To this point, how successful have you been in attaining this goal? (From 0% successful to 100% successful).” Next the goal’s difficulty rating is assessed by asking, “How difficult is this goal? (1 = *very easy* to 5 = *very difficult*).” Goal attainment scores at Time 1 for each individual are calculated by multiplying the success score by the difficulty score. As illustrated previously in Figure 3, this procedure is repeated at Time 2 and an overall goal attainment change score is then calculated by subtracting the goal attainment scores of Time 1 from Time 2.

Perceived competence. This construct was measured by adapting the scale created by Deci and Ryan (2009), which has been published in a variety of peer-reviewed publications (e.g., Williams & Deci, 1996; Williams, Freeman, & Deci, 1998). The scale has four items that are typically written to be relevant to the specific behavior or domain being studied (Deci & Ryan, 2009), and this study adapted the items to reflect participants perceived competence related to the goal they intend to pursue. The alpha measure of internal consistency for the perceived competence items in this study was 0.72, which is similar to alphas utilized in other study’s adapting the scale (e.g., Williams, Ryan, & Deci, 2009). This study’s scale used Likert-type agreement anchors ranging from 1 = *Strongly Disagree* to 4 = *Neutral*, and finally to 7 = *Strongly Agree*. Sample items include, “I feel confident in my ability to attain my goal” and “I am capable of attaining my goal.” The complete list of items is located in Appendix 4.

Planning. A four-item measure was created for this study based on goal-setting research findings. As discussed previously, participants who engage in more intense cognitive processing, specifically if they (1) articulate when, where, and how they plan on implementing their goals, and (2) visualize the steps required for goal achievement, they are more likely to achieve them

(Gollwitzer et. al, 1990, Taylor et. al, 1998). To accommodate the fact that participants all created unique goals to pursue over the course of the study (four weeks), the following questions focus broadly on the *how* dimension of goal planning. Example items include, “I’ve visualized the steps I will take to accomplish my goal,” and “I’ve anticipated barriers that may interfere my attaining my goal.” The complete list of items for this variable is located in Appendix 4. This scale used Likert-type agreement anchors ranging from 1 = *Strongly Disagree* to 4 = *Neutral*, and finally to 7 = *Strongly Agree*, and yielded an alpha reliability coefficient equal to 0.74.

Goal commitment. This variable was measured using a five item measure validated by Klein, Wesson, Hollenbeck, and Wright (2001). Klein et al. (2001) identified this measure by combining results of 17 independent samples and 2918 subjects, in a study that utilized meta-analytic and multisample confirmatory analytic techniques. The scale was shown to be unidimensional and equivalent across measurement timing, goal origin, and task complexity, and was also show to be a psychometrically sound, construct relevant, robust, and widely generalizable measure of one’s determination to reach a goal. Example items include, “I am strongly committed to pursuing this goal,” and “I think this is a good goal to shoot for.” The complete list of items for this variable is listed in Appendix 4. This scale used Likert-type agreement anchors ranging from 1 = *Strongly Disagree* to 4 = *Neutral*, and finally to 7 = *Strongly Agree*, and yielded an alpha reliability coefficient equal to 0.72.

Goal self concordance. This construct was measured using a scale created by Sheldon & Elliot (1998), and further refined by Sheldon & Houser-Marko (2001). Participants were asked to rate their agreement with four reasons they may be pursuing their goal, listed in Appendix 4. Their relative ratings determines the degree they are pursuing goals for autonomous versus controlled reasons. Example items include, “You strive for this goal because you really believe

it's an important goal to have.” for autonomous reasons and, “You strive for this goal because you would feel ashamed, guilty, or anxious if you didn't.” for controlled reasons. The two controlled reasons questions are reverse scored. A single self-concordance score was calculated by summing the autonomous ratings and subtracting the controlled ratings as has been done in research previously (e.g., Burke & Linley, 2007; Sheldon & Houser-Marko, 2001; Williams, Grow, Freedman, Ryan, & Deci, 1996). A series of studies conducted by Sheldon & Houser-Marko (2001) using this scale reported a Cronbach's alpha = .78 and .75 respectively. The following scale used Likert-type agreement anchors ranging from 1 = *Strongly Disagree* to 4 = *Neutral*, and finally to 7 = *Strongly Agree*.

In this study, Cronbach's alpha coefficient of internal consistency for GSC equaled 0.52. This score is below the 0.70 “acceptability” standard: according to George and Mallery (2003) an alpha coefficient score of between 0.5 and 0.6 is “questionable”, while a score below 0.5 would be “poor and unacceptable.” Although the scale had performed in accordance to the 0.70 standard in previous studies (e.g., Burke & Linley, 2007), the alpha score obtained in this study indicates that the scale in this case lacked internal consistency and reliability. This was an unexpected result and follow-up analysis demonstrated that GSC's two sub-scales, which measure relative ‘autonomous’ and ‘controlled’ reasons for goal pursuit, also received low reliability scores. One contributing factor to this result may be that each subscale was composed of two items each, which is one fewer than suggested by scale measurement researchers (e.g., Fishman, & Galguera, 2003). Overall, therefore, the results of the hypothesis test for this variable, presented in the next chapter, should be viewed with extraordinary caution given the questionable alpha of the GSC scale.

Conscientiousness. This construct was assessed by a 10-item subscale of the International Personality Item Pool (IPIP) (Goldberg, 1999). The IPIP scales measure personality based on the Five Factor Model of personality (Costa & McCrae, 1992). Participants were presented with statements and asked to indicate their agreement with how accurately each one describes them. This study used the IPIP subscales conscientiousness (IPIP-C, N=10) and internal reliabilities of this subscale has been found to be .81 in previous studies (Goldberg, 1999). The alpha reliability coefficient in this study was found to equal 0.84. Example items include, “I am always prepared” and “I carry out my plans.” This scale used Likert-type agreement anchors ranging from 1 = *Strongly Disagree* to 4 = *Neutral*, and finally to 7 = *Strongly Agree*. The complete list of items for this variable is in Appendix 4.

Goal stability. Since goal instability can confound findings of goal setting research, including GAS methodology (Spence, 2008), the following scale was developed to determine whether participants’ goals changed or evolved over the course of the study. The 3-item scale was created by reviewing literature that discussed the role of goal instability in conducting goal-setting research, most notably Spence (2008). As discussed previously, goal stability is defined as the degree to which the aspirations, intentions, and motivations driving goal pursuit remain steady or consistent. The three items created to assess this construct were: “My reasons for pursuing this goal have remained steady over the past four weeks or so,” “My interest in this goal did not change significantly over the past four weeks or so,” and “My understanding of this goal did not change significantly since the first telephone interview.” Each individual question used Likert-type agreement anchors ranging from 1 = *Strongly Disagree* to 4 = *Neutral*, and finally to 7 = *Strongly Agree*. The goal stability scale yielded a reliability alpha coefficient equal to 0.77.

Goal opportunity. To verify that research participants had the opportunity to pursue their goals, the following item was created: “I had the opportunity to pursue my goal over the past four weeks or so.” The question used a Likert-type agreement anchor ranging from 1 = *Strongly Disagree* to 4 = *Neutral*, and finally to 7 = *Strongly Agree*.

Demographic variables. In order to describe this study’s sample the following demographic data of participants was measured: age, gender, race, and employment status. Exact questions are listed in Appendix 4.

Information about coaching sessions. For participants in the coaching condition, two items were created to measure coaches’ experience. To clarify these items do not comprise a scale. All participants were asked the following questions: “Is your coach new (practice for 0 – 3 yrs), experienced (3 – 7 yrs), or a seasoned (8 or more yrs)?” and “Was your coach certified by the Hudson Institute?” This second question was to test the assumption that the vast majority of coaches were certified by the HI Institute. In addition, the following items were created to assess the number of coaching sessions participants experienced over the course of the study, “How many coaching sessions have you experienced since the first telephone interview?” This information helps verify that participants in the coaching condition spent a similar number of hours being supported by a coach with similar training and similar experience. All items are also listed in the Appendix 4 for reference.

Chapter 4: Results

The following chapter details the results obtained by this study. Preliminary analyses are discussed first, and then the results from each of the study's hypotheses are examined in turn. Supplementary analysis follows one of the important hypothesis test findings. The chapter concludes with a presentation of additional post-hoc, exploratory analyses.

Preliminary Analysis

Four preliminary analyses were conducted for this study. First demographic variables were correlated with the dependent variable, total goal attainment, to determine whether or not these variables unintentionally influenced the outcome of the study. Table 6 presents the correlations of participants' age, employment status, and gender with the dependent variable. None of the correlations were found to be significant at a p-value equal to 0.05 or less when using Pearson's Product-Moment Correlation Coefficient 2-tailed test. Additionally, Table 7 displays a univariate analysis of variance (ANOVA) examining whether participants' racial group membership influenced total goal attainment, which was also not significant, $F(3, 44) = 46.89, p = .88, ns$. Therefore, overall, the demographic variables did not yield undue influence upon the study's dependent variable.

Second, goal opportunity was assessed in order to eliminate a competing hypothesis, namely, that participants did not have the opportunity to pursue their goal during the experimental period. Only one participant strongly indicated that he or she did not have the opportunity due to a family emergency that occurred during the experimental period. The mean response for goal opportunity was 6.3 on a 7-point Likert-type scale, with a relatively low standard deviation of 1.5. Furthermore, 90% of participants answered between 5 and 7 to indicate an "Agree" to "Strongly Agree" response. Overall, therefore, nearly the entire sample

agreed that they had the opportunity to pursue their respective goals during the experimental period.

Third, goal stability was assessed in order to eliminate another competing hypothesis, namely, that participants' goals changed significantly, or that participants' understanding of their goal changed significantly, and therefore the goal was no longer relevant or worthy of pursuit. The mean response for the 3 items equaled 6.5 on a seven-point Likert-type scale, with 87% of participants answering between 5 and 7 on all 3 items to indicate an "Agree" to "Strongly Agree" response. Overall, therefore, it appears that for the vast majority of participants, their goals did not change significantly and were stable over the course of the experimental period.

The final preliminary analysis relates to this study's coaching condition. The total number of coaching hours received between Time 1 and Time 2 was measured for each participant in the coaching condition, as was the relative experience of their coach. The average number of coaching hours these participants received was 3.5 hours, with a standard deviation of 1.5 hours. 70% of participants enlisted the assistance of an experienced or seasoned coach, as opposed to a new coach defined as less than 3 years of professional practice. Therefore, despite some variance, overall the participants in the coaching condition received a similar coaching intervention by a similarly trained coach with a similar level of experience.

Hypotheses Tests

Table 8 displays the means, standard deviations and correlations of the study's variables. A 2x2 univariate ANOVA with GAS (yes versus no) and Coaching (yes versus no) was utilized to explore potential interactions of the between subject factors as predictors of the dependent variable, total goal attainment. In line with Baron and Kenny's (1986) mediator analysis procedure, regression was used to determine the possible impact of mediators on the dependent

variable, while T-tests were used to determine an impact of each IV on each potential mediator. Finally, linear regression was used to analyze the potential impact of moderators since Conscientiousness and Goal Self Concordance are continuous variables.

Main effects and interactions: GAS and Coaching. Table 9 displays the cell means and standard deviation for each of the four quadrants of the 2x2 ANOVA. Despite the means being in the hypothesized directions, no significant main effects were detected for GAS, $F(1, 48) = .03, p = .86, ns$, or Coaching, $F(1, 48) = .81, p = .37, ns$. The interaction effect for GAS x Coaching was also not significant, $F(1, 48) = .00, p = .98, ns$. Therefore, hypotheses 1, which stated that participants who scale their goals with the GAS technique will achieve higher goal attainment than participants who do not scale their goals over time, was not supported. Similarly, hypothesis 2, which stated that participants whose goals are supported with coaching will achieve higher goal attainment change scores than participants whose goals are not supported with coaching, was not supported. Hypothesis 3a, which stated participants who experience the GAS technique while being supported by coaching will achieve higher goal attainment change scores than participants who experience the GAS technique without coaching, was also not supported. Finally, hypothesis 3b, which stated participants who experience the GAS technique while being supported by coaching will achieve higher goal attainment change scores than participants who experience coaching without the GAS technique, was also not supported.

Potential mediators: Perceived goal competence, Planning, and Goal commitment. Since no main effect was found for GAS on the dependent variable, total goal attainment, a mediator analysis is immaterial (e.g., Baron & Kenny, 1986). However, a number of analyses can be conducted to explore where the hypothesized causal chain breaks down. For example, it is possible that GAS affects the mediators and that the mediators do not affect participants' total

goal attainment. Independent samples t-tests and Pearson's correlations were utilized to determine if the affect of GAS on total goal attainment breaks down in certain steps or in its entirety. See Table 10. Each hypothesized link is examined below in turn.

Hypothesis 4a, which stated that participants who experience a GAS technique will have higher perceived goal competence than participants who do not experience a GAS interview, was tested with an independent samples t-test. No significant effect of GAS on perceived goal competence was found, $t(48) = .07, p = .95, ns$. Therefore, hypothesis 4a was not supported.

Hypothesis 4b, which stated that participants with higher perceived goal competence will achieve higher goal attainment change scores than participants with lower perceived goal competence, was examined using Pearson's correlation. No significant correlation between perceived goal competence and total goal attainment was found, $r(46) = .13, p = .37, ns$. Therefore, hypothesis 4b was not supported.

Hypothesis 5a, which stated that participants who experience a GAS technique will do more planning than participants who do not experience a GAS technique, was tested with an independent samples t-test. Results indicate a non-significant trend in the hypothesized direction with participants planning more in the GAS condition ($M = 4.80, SD = 1.50$) than in the No-GAS condition ($M = 4.67, SD = 0.92$), $t(42) = -.40, p = .69, ns$.

Hypothesis 5b, which stated that participants who do more planning will achieve higher goal attainment change scores than participants who do less planning, was examined using Pearson's correlation. No significant correlation between planning and total goal attainment was found, $r(46) = -.03, p = .84, ns$. Therefore, hypothesis 5b was not supported.

Hypothesis 6a, which stated that participants who experience a GAS technique will be more committed to their goals than participants who do not experience a GAS interview, was

tested with an independent samples t-test. Results indicate a non-significant trend in the hypothesized direction with participants having higher commitment in the GAS condition ($M = 6.45$, $SD = 0.55$) than in the No-GAS condition ($M = 6.28$, $SD = 0.79$), $t(41) = -.84$, $p = .41$, *ns*.

Hypothesis 6b, which stated that participants with higher commitment will achieve higher goal attainment change scores than participants with lower commitment, was examined using Pearson's correlation. A significant, positive correlation between goal commitment and total goal attainment was found, $r(46) = .36^{**}$, $p = .01$. Therefore, hypothesis 6b was supported and participants with higher goal commitment did achieve higher goal attainment change scores as predicted.

Potential moderator: Goal self concordance. Since Goal Self Concordance (GSC) is a continuous variable, regression was used to evaluate the impact of the moderator on GAS's potential impact on the dependent variable, total goal attainment. The overall regression model was not significant, $R^2 = .03$, $F(3, 47) = .43$, $p = .73$, *ns*. The main effect for GSC was not significant, $b = -.13$, $t(43) = -.58$, $p = .57$, *ns*. The main effect for GAS was also not significant, $b = .04$, $t(43)$, $p = .87$, *ns*. The interaction of GSC and GAS was also not significant, $b = -.07$, $t(43) = -.25$, $p = .80$, *ns*. See Table 11. Therefore, no support was found for hypothesis 7a, which stated that GAS will improve the goal attainment change scores of participants with low Goal Self Concordance more than for participants with high Goal Self Concordance. No support was found for hypothesis 7b, which stated that the goal attainment changes scores of GAS participants with low Goal Self Concordance will be higher than scores by no-GAS participants with low Goal Self Concordance. Finally, no support was found for hypothesis 7c, which stated that the goal attainment changes scores of GAS participants with high Goal Self Concordance will be slightly higher than scores by no-GAS participants with high Goal Self Concordance.

Potential moderator: Conscientiousness. Since Conscientiousness is a continuous variable, regression was used to evaluate the impact of the moderator on GAS's potential impact on the dependent variable, total goal attainment. The overall regression model was not significant, $R^2 = .06$, $F(3, 47) = .96$, $p = .42$, *ns*. The main effect of Conscientiousness was found to approach significance: $b = .32$, $t(43) = 1.69$, $p = .10$. No main effect for GAS was found, $b = .99$, $t(43) = .90$, $p = .37$, *ns*. The interaction of GAS and Conscientiousness was also not significant, $b = -1.0$, $t(43)$, $p = .37$, *ns*. See Table 12. Therefore, no support was found for hypothesis 8a, which stated that participants in the no-GAS condition who are highly conscientious will achieve higher goal attainment change scores than participants in this condition who are less-conscientious. Highly conscientious participants appeared to achieve higher goal attainment change scores than those who are less-conscientious overall, but not necessarily in the GAS condition as the hypothesis predicted.

No support was found for hypothesis 8b, which stated that the goal attainment change scores of GAS participants with low conscientiousness will be higher than scores by no-GAS participants with low conscientiousness. Finally, no support was found for hypothesis 8c, which stated that the goal attainment changes scores of GAS participants with high conscientiousness will be slightly higher than scores by no-GAS participants with high conscientiousness.

Supplementary Analysis of Conscientiousness. To this point, the analysis of Conscientiousness as a potential moderator of total goal attainment only included GAS as the between subject variable. Given that Conscientiousness was found to influence goal attainment, a more comprehensive supplementary analysis was conducted that included Coaching as an independent variable as well. The forthcoming section presents the results of a multiple linear

regression that examined a potential 3-way interaction between Conscientiousness, GAS and Coaching, in predicting total goal attainment.

Results of GAS, Coaching, and Conscientiousness Multiple Regression. Table 13 displays the regression coefficients, t-values, and p-values for the regression equation. The overall regression model was not significant, $R^2 = .17$, $F(7, 40) = 1.16$, $p = .35$, *ns*. The main effect for GAS was not significant, $b = -1.81$, $t(38) = -.94$, $p = .35$, *ns*. The main effect for Coaching was not significant, $b = -2.77$, $t(38) = -1.58$, $p = .12$, *ns*. The main effect for Conscientiousness was not significant, $b = -.36$, $t(38) = -.81$, $p = .43$, *ns*. Therefore, each of the three independent variables did not significantly affect the dependent variable, total goal attainment, individually.

The two-way interaction between GAS and Coaching approached significance, $b = 4.79$, $t(38) = 1.92$, $p = .062$. The two-way interaction between GAS and Conscientiousness was not significant, $b = 1.90$, $t(38) = .96$, $p = .34$, *ns*. The two-way interaction between Coaching and Conscientiousness approached significance, $b = 3.04$, $t(38) = 1.69$, $p = .099$. Therefore, there is some evidence that two pairs of independent variables -- GAS and Conscientiousness, as well as Coaching and Conscientiousness -- interacted in predicting participants' total goal attainment.

Finally, the three-way interaction between GAS, Coaching, and Conscientiousness approached significance, $b = -5.02$, $t(38) = -1.95$, $p = .058$. Therefore, there is some evidence that the three independent variables interacted as a group to predict participants' total goal attainment.

Researchers such as Cohen (1990), as well as Rosnow and Rosenthal (1989), suggest *p* values approaching alpha levels of 0.05 are noteworthy and warrant analysis. Furthermore, interpreting 3-way interactions present in multiple regression outputs takes precedent over interpreting 2-way findings. Therefore, the following section will further explore the meaning of

the 3-way interaction between Conscientiousness, GAS, and Coaching that approached significance, as opposed to the two 2-way interactions that approached significance.

Interpreting GAS, Coaching, and Conscientiousness 3-way finding. Graphing assists interpretation of 3-way interactions. Cohen and Cohen (1983) recommend using cell means at one standard deviation above and one standard deviation below the continuous variable, Z , in order to graph the 3-way interaction of $X*Y*Z$ when X and Y are categorical variables. This recommendation applies to this study since Conscientiousness is a continuous variable, while GAS and Coaching are categorical variables. Thus, the mean and standard deviation of Conscientiousness in this sample were calculated: $M = 5.5$, $SD = 0.8$. Participants who scored above or below the mean are henceforth referred to as High Conscientious and Low Conscientious respectively. The 3-way interaction effects were then graphed following the procedure outline by Preacher, Curran, and Bauer (2006) and displayed in Figure 11.

Low Conscientious participants in this study achieved the highest goal attainment change scores when they received both GAS and Coaching to support their goal ($M = 316$). GAS did not appear to help this population as much without Coaching ($M = 110$). Coaching without GAS did not appear to help this population as much either ($M = 75$). Finally, when participants did not receive either Coaching or GAS their total goal attainment scores were higher than when they received only one of these two interventions ($M = 218$).

High Conscientious participants in this study achieved the highest goal attainment change scores when they received Coaching without GAS to support their goals ($M = 276$). GAS did not appear to help this population as much when combined with Coaching ($M = 116$). GAS without Coaching appeared to help this population somewhat more ($M = 173$). Finally, when participants did not receive either GAS or Coaching their total goal attainment scores were lowest ($M = 64$).

Therefore, for Low Conscientious participants GAS appeared to work better than No GAS when the participants were supported by coaching. However, when Low Conscientious participants were not supported by coaching, No GAS worked better than GAS. For High Conscientious participants, No GAS appeared to work better than GAS when the participants were supported by coaching. However, when High Conscientious participants were not supported by coaching, GAS worked better than No GAS.

Additional Exploratory Analyses

After all data was collected and the initial analysis was complete, three areas appeared worthy of further statistical exploration. They are titled (1) Retrospective Goal Attainment, (2) Goal Type, and (3) Goal Order respectively, and each is discussed in turn.

Retrospective total goal attainment. The first area relates to potential instrumentation threats to the validity of the dependent measure, total goal attainment. Research focusing on unintentional participant bias in survey methodology has demonstrated that people's understanding of key concepts may evolve between measurement occurrences, thereby confusing interpretation of results. For example, a participant may set a goal of becoming a visionary leader and rate themselves at Time 1 as 50% successful at this goal. Approximately one month later at Time 2 they rated themselves again as being 50% successful at achieving this goal. This could mean that the participant did not make progress on their goal, or alternatively, that this participant, with the aid of their coach, developed a deeper understanding of what visionary leadership entails and a more accurate understanding of their current state. In other words, this participant may have unintentionally over-rated themselves at Time 1. This type of reconceptualization, or redefinition, of key concepts is called "gamma change" (Golembiewski, Billingsley & Yeager, 1976) and the resulting threat to validity is called "response shift bias"

(Howard, 1981). A technique called “retrospective recall” (Howard, Millham, Slaten, & O’Donnell, 1981) helps address response shift bias by asking participants at Time 2 to rate their Time 1 baseline measure again, post-hoc. This helps ensure that participants’ understanding of their goals, in this case, is consistent. In line with this methodology, participants were asked in this study at Time 2: “Looking back at Time 1, how would you rate your baseline goal attainment from 0% to 100%?” Similarly participants were asked in this study at Time 2 about their goal difficulty: “Looking back at Time 1, how would you rate your baseline goal difficulty from 1(very easy) to 5 (very difficult)?” Using these two numbers a *retrospective* total goal attainment score was calculated, and used as an alternative measure for the dependent variable. The core hypotheses of this study were then explored using this retrospective measure and the results are discussed below.

Retrospective total goal attainment results. As listed in Table 8, retrospective total goal attainment’s mean was somewhat higher ($M = 186$) relative to total goal attainment ($M = 161$), and the constructs were significantly correlated, $r(46) = .82$, $p < .01$. None of the hypothesized effects proposed in any of this study’s eight hypotheses yielded significant results when retrospective total goal attainment was used in lieu of total goal attainment. For the reader’s reference, Table 14 displays the cell means and standard deviations for the main effect of GAS and Coaching on retrospective total goal attainment. Even though retrospective total goal attainment did not produce significant results in the previous analyses, it did yield significant results in the following analyses involving Goal Type and Goal Order.

Goal Type and Goal Order. The second and third areas that appear worthy of further exploration relate to the nature of participants’ goals. After listing all goals chosen by this study’s sample it became clear that they could be organized into two different categories. First,

the goals could be organized by *Goal Type*, meaning that participant goals appeared to cluster around two types of goals: career-related objectives or, alternatively, personal-life related objectives. “Career goals” were defined as objectives relating to performance improvement, professional development (including school work), financial management, finding work, and other issues related to work. “Personal goals” were defined as objectives relating to health, exercise, diet, work-life balance, and other activities intended to nurture one’s personal life. Table 15 lists specific participant goals organized into the Career versus Personal categories.

Secondly, in line with research done on the hierarchical nature of goals (Emmons, 1992; Spence 2008; Carver & Scheier, 1982), the goals from this study could be categorized as *High Order* or *Low Order* goals. High Order refers to goals that address the “big picture” and are under pinned by sub-goals. Low Order refers to goals that are easily measurable in that they are specific, behavioral, and quantifiable. In other words, if a participant would need to break down a big goal into numerous, smaller goals in order to achieve it, then the goal is High Order. For example, if a participant’s goal is to pass a standardized test, and this goal requires studying numerous hours, hiring a tutor, and taking practice exams, then the goal of passing the standardized test would be considered High Order. Taking two practice exams every week for 6 weeks would be considered a Low Order goal. Table 16 lists specific participant goals organized into High versus Low order goals.

To help establish that the two new constructs, Goal Type and Goal Order, each had strong internal reliability, a number of analyses were conducted. First, Career related goals were coded “1”, while Personal related goals were coded “0.” A second independent rater also coded the goals, and a very high inter-rater reliability coefficient was found: Cohen’s Kappa equaled 0.96, with a standard error of 0.04. Note that for participants in the GAS condition, the goals used for coding were the goals these participants articulated *after* the GAS intervention, since

goals may be modified as a result of the GAS process. In other words, coding after the GAS intervention ensures that the coding reflects the goal that the participant actually pursued.

Frequencies of Goal Type are presented in Table 17.

Second, High order goals were coded “1”, while Low order goals were coded “0”. A second independent rater was used to determine inter-rater reliability of the coding results, and a high inter-rater reliability coefficient was found: Cohen’s Kappa equaled 0.83, with a standard error of 0.08. Note that for participants in the GAS condition, the goals used for coding were the goals these participants articulated *before* the GAS intervention, since the GAS process creates Low order goals by design. In other words, coding before the GAS intervention prevents goals from all being coded as Low order goals. Frequencies of Goal Order are presented in Table 17.

Finally, two tests were conducted to demonstrate that the two new constructs were in fact different from one another. First, as listed in Table 8, the two variables were found not to be significantly correlated with one another, $r(47) = .13$. Second, a binomial nonparametric test was conducted to verify that the rate at which Low and High Order goals appear in the sample at large is equal to their rate of appearance within Personal and Career Goals. In other words, if the two constructs are in fact independent of one another, then the proportion of one variable’s occurrence within the sample at large should equal its rate of appearance within the other variable. A binomial test revealed this to in fact be the case, $z = .85$, $p = .29$, *ns*.

Thus, overall, the two constructs appear to be internally consistent and significantly independent from one another. As such, it is possible to explore whether Goal Type and/or Goal Order moderate the influence of GAS and Coaching impact on total goal attainment. Multiple regression was utilized to explore this possibility. Results are presented below.

Goal Type results. To explore whether Goal Type moderated the relationship between GAS and the goal attainment of participants, a 2 x 2 univariate ANOVA examined the 2-way interaction between Type and GAS. When using total goal attainment as the dependent variable, the interaction approached significance: $F(3,48) = 2.9, p = .09$. However, when using retrospective total goal attainment as the dependent variable, the interaction was significant: $R^2 = .14, F(3,47) = 5.2, p = .03$. The 2-way interaction graph is displayed in Figure 12. The estimated marginal means for Career Goals were 269 in the GAS condition and 150 in the No GAS condition. For Personal Goals, the estimated marginal means were 134 in the GAS condition and 196 in the No GAS condition. A post-hoc comparison of these means confirmed this by finding the significance to lie within Career goals (GAS versus No GAS, 95% CI [-3.6, 240.9], $p = .057$) as opposed to Personal goals (GAS versus No GAS, 95% CI [-41.0, 164.6], $p = .23, ns$). Therefore, it appears that for Career related goals, GAS works better than No GAS. On the other hand, for Personal goals there was no significant difference between GAS and no GAS.

To explore whether Goal Type moderated the relationship between Coaching and the goal attainment of participants, a 2 x 2 univariate ANOVA was used to examine the 2-way interaction between Type and Coaching. No significant results were detected when using total goal attainment or retrospective total goal attainment as the dependent variable. See Tables 18 and 19.

Finally, multiple linear regression was used to test for a possible 3-way interaction between Type, GAS, and Coaching. No significant results were detected when either total goal attainment or retrospective total goal attainment was used as a dependent variable. See Tables 20 and 21.

Goal Order results. To explore whether Goal Order moderated the relationship between GAS, Coaching, and the goal attainment of participants, multiple linear regression was used. Table 22 displays the regression coefficients, t-values, and p-values for the regression equation. The main effect for GAS was not significant, $b = -.47$, $t(38) = -1.3$, $p = .20$, *ns*. The main effect for Coaching was not significant, $b = -.15$, $t(38) = -.43$, $p = .67$, *ns*. The main effect for Order was not significant, $b = -.50$, $t(38) = -1.32$, $p = .20$, *ns*. Therefore, each of the three independent variables did not significantly affect the dependent variable, total goal attainment, individually.

The two-way interaction between GAS and Coaching approached significance, $b = .68$, $t(38) = 1.95$, $p = .059$. The two-way interaction between GAS and Order also approached significance, $b = .66$, $t(38) = 1.81$, $p = .078$. The two-way interaction between Coaching and Order did not approach significance, $b = .37$, $t(38) = 1.00$, $p = .32$. Therefore, there is some evidence that two pairs of independent variables -- GAS and Coaching, as well as GAS and Order -- interacted in predicting participants' total goal attainment.

The three-way interaction between Order, GAS, and Coaching was significant in predicting total goal attainment, $R^2 = .18$, $F(1,48) = 2.3$, $p = .02$. When using retrospective total goal Attainment as the dependent variable, the 3-way interaction was also significant, $R^2 = .26$, $F(1, 48) = 2.4$, $p = .02$. The three-way interaction effects were graphed and displayed in Figure 13, also using total goal attainment as the dependent variable. The graph was created following the procedure outline by Preacher, Curran, and Bauer (2006).

Interpreting GAS, Coaching, and Order 3-way finding. For participants who identified Low order goals, the most effective goal attainment intervention by far was GAS combined with Coaching ($M = 328$). When participants do not receive GAS, the total goal attainment change scores are relatively comparable whether they receive Coaching or not ($M = 176$ versus $M =$

209). Participants scored the lowest goal attainment change scores when they only received GAS without coaching ($M = 104$).

For participants who identified High order goals, the most effective goal attainment intervention was when they only received GAS ($M = 189$). When participants only received Coaching, this yielded slightly lower goal attainment change scores ($M = 176$). When participants received both Coaching and GAS, their goal attainment change scores were somewhat lower ($M = 114$). Participants scored the lowest goal attainment change scores when they did not receive GAS or Coaching ($M = 85$).

Therefore, for participants with Low order goals, GAS was better than No GAS when they were supported by coaching. Without the support of coaching, No GAS was better than GAS for participants with Low order goals. For participants with High order goals, No GAS worked better than GAS when they were supported by coaching. Without the support of coaching, GAS worked better than No GAS for participants with High order goals.

Chapter 5: Discussion

This study is part of the growing body of empirical research on coaching outcomes, particularly those that focus on goal attainment as the dependent variable (e.g., Grant et al., 2009). To help put the current study's contribution into context, the first published coaching study that utilized goal attainment as a dependent variable was eight years ago (Grant, 2003), and of the 18 between-subject studies ever published on coaching, 5 utilize goal attainment as an outcome variable (Grant, 2011).

This study is also part of the body of empirical research on Goal Attainment Scaling (GAS). Despite GAS's long track record in various professional helping settings (Schlosser, 2004), and its utilization in goal-setting research (e.g., MacKay & Lundie, 1998), this was the first study to test the hypothesis that GAS may increase the goal attainment of participants. A number of researchers had theorized this possibility (e.g., Sheldon & Elliot, 1998), including Spence (2007) when he introduced the cognitive-behavioral technique to the coaching literature.

The current study found that goal attainment was not directly affected by GAS when the technique was used on its own, when coaching was used on its own, or when the two interventions were used in combination. In fact, a more complex relationship was discovered where the influence of GAS and coaching on goal attainment depended on the type of goal an individual selected and the individual characteristics of the coachee. This relationship, gleaned from exploratory analyses, will be explained later. First, this study's hypothesized, albeit non-significant findings are explained.

Hypothesized Findings

The current study did not find GAS nor coaching to significantly influence participants' goal attainment. It also did not find a significant interaction between GAS and coaching to

predict participants' goal attainment. Furthermore, a potential moderator variable, Goal Self Concordance, did not affect whether or not GAS influenced participants' goal attainment. Finally, three potential mediating variables - perceived competence, planning, and goal commitment – were investigated to help determine *why* GAS may influence participants' goal attainment. Since no statistically significant main effect was found for GAS, the hypothesized chain of events for these mediators could not be validated. However, some supporting linkages were found for two out of the three mediating variables proposed. Each is now discussed in turn.

Goal self concordance. No support was found for Goal Self Concordance (GSC) as a possible moderator of GAS's influence on goal attainment. In other words, goal attainment was not dependant on whether participants articulated goals that expresses their enduring interests and values, or not. This finding contrast with previous research that demonstrated that when goals are self-concordant, participants are more likely to attain them (e.g., Koestner, Lekes, Powers, & Chicoine, 2002). Although participant responses to GSC were not restricted or heavily weighted towards either a floor or ceiling effect, the measure did record a low reliability alpha of 0.52. This is below the 0.70 standard and thus the variable may not have reliably measured the extent to which participants' goals were self concordant. If so, this would help reconcile this study's non-significant findings with the body of research that found GSC to influence participants' goal attainment.

Perceived competence. GAS did not significantly influence participants' perceived competence, and perceived competence did not significantly impact participants' goal attainment. These findings contrast with previous research linking perceived competence and goal attainment (Elliot & Dweck, 2005; Schunk & Pajares, 2005). This discrepancy may be explained by the fact that this sample scored themselves high on the perceived competence

measure regardless of whether they (1) ended up achieving their goals and (2) were exposed to the GAS technique. This lack of variability could have prevented a relationship with goal attainment from being detected. So why did the participants score themselves high on the perceived competence measure? The answer may relate to this sample's affiliation with a coaching institution. Coaching often presumes that people have the requisite inner-resources and capabilities to achieve their goals and create their desired future state. Therefore, students in a coaching school may perceive that they have the competence to achieve the goals they set.

Furthermore, this study's non-significant results suggest that the GAS technique may not enhance participants' perception that they are competent at a behavior that is instrumental to their desired outcome. This is evidenced by the fact that the mean scores in the GAS and No-GAS conditions were comparable. For example, if a participant's goal is to demonstrate strategic behaviors in her weekly meetings, such as asking more questions and sharing knowledge from higher up in the organization, she may not necessarily feel more capable of performing these behaviors after creating a GAS chart. In other words, just because a participant articulates a specific goal and identifies a range of possible outcomes, does not necessarily mean that the participant's confidence to exhibit the required behaviors will be enhanced, even if the goal is vetted as being realistic. Future research is required to further explore what exactly enhances people's perceptions of competence, and whether or not the steps of creating a GAS chart can be modified in order to facilitate such enhancement, because the current procedure does not appear to do so.

Planning. GAS did not significantly influence the amount of planning participants engaged in when pursuing their goals. Furthermore, the amount of planning participants engaged in did not significantly result in an increase in goal attainment. The lack of statistically

significant findings contrasts with previous research which has demonstrated strong linkages between planning and goal attainment (e.g., Smith, et al., 1990; Gollwitzer & Brandstatter, 1997). It should be noted that a non-significant trend was found between GAS and planning in the hypothesized direction, which aligns with suggestions made by previous GAS researchers, such as Spence (2007) and Sheldon and Elliot (1998), that GAS may enhance participants' goal attainment because the technique stimulates planning. It is possible however that the GAS process does not stimulate as much planning as presumed. For example, the technique does not necessarily guarantee that participants spend a lot of time thinking about how to accomplish their goal, or how they will overcome barriers. Furthermore, GAS does not have participants imagine the actual steps they will take to achieve their goal, which has been shown to significantly improve performance (Taylor et al., 1998). Overall, the GAS chart making procedure may cause some of these thoughts to occur in participants, but because it is not a formal part of the process there is no guarantee that they will occur.

Goal commitment. GAS did not significantly influence participants' goal commitment. However, a non-significant trend between GAS and goal commitment was found in the hypothesized direction, and a significant correlation between goal commitment and participants' total goal attainment was detected. The latter finding aligns with the robust literature on goal-setting which links goal commitment to successful performance (e.g., Lock & Shaw, 1984). The hypothesized link between goal commitment and GAS, on the other hand, was based partly on the presumption that when participant articulate their goal to the researcher during the GAS chart making process, that this would be similar to making a public commitment. Research has shown that when goals are made public, goal commitment is enhanced (Hollenbeck, Williams, & Klein, 1989). In retrospect, this may have been a flawed presumption since participants shared their

goals in a private, confidential manner with the researcher and thus a public commitment to the goals was not truly made. Furthermore, participants in the No-GAS condition also articulated their goals to the researcher, so the GAS process may not have provided much added benefit in this regard.

Finally, the hypothesized link between GAS and goal commitment was also based on research that shows goal commitment to become enhanced when people receive supportive behaviors from a supervisor (Latham & Saari, 1979; Ronan, Latham, & Kinne, 1973). Given that researchers are often seen as authority figures, it was presumed that the supportive behaviors enacted by the researcher during the GAS process would have a similar impact on participants. This too may have been a flawed presumption. However, the non-significant trend in the hypothesized direction suggests that in fact a similar impact may have occurred, only weaker.

Major Findings

The Role of Goal Type. One of the major finding of this study was that the type of goals that participants chose, whether they were personal or career related, influenced the impact of GAS on goal attainment. Specifically, GAS resulted in higher goal attainment relative to the No-GAS condition for career related goals. However, for personal goals no significant difference in goal attainment was detected between GAS and No-GAS. It is possible that different types of goals, such as career or personal goals, will be influenced differently by coaching techniques or methodologies.

Perhaps the objective nature of GAS and its focus on concrete, observable behaviors makes it work well with career related goals. For example, demonstrating specific, strategic behaviors in weekly meetings with subordinates may be a logical and straightforward step for a participant wishing to become a visionary leader at work. In other words, the behaviors

identified by the GAS technique may help motivate participants to achieve their work-related goals. This possibility needs to be confirmed with future research.

Conversely, perhaps the behavioral focus and structured method of GAS does not lend itself as well to goals that are personal. In other words, perhaps the GAS process may feel too “emotionally detached” to participants who pursue these types of goals. Furthermore, a number of the personal goals pursued by participants in this study related to weight loss, exercise and “leading a healthier life.” This domain may be a specialty beyond the influence of GAS – certainly weight-loss and smoking-cessation goals are supported by their own research and theoretical bodies of knowledge (e.g., Prochaska, DiClemente, & Norcross, 1992).

Overall, as the body of GAS and coaching research grows certain parameters, such the types of goals set, may be found to consistently influence the utility of particular interventions on participants’ goal attainment. Another such parameter may be Goal Order.

The Role of Goal Order. A second major contribution of this study was that depending on whether participants chose big picture goals or micro specific goals to pursue, and whether or not they were supported with additional coaching, the GAS technique yielded different results. Previous goal setting researchers utilizing GAS asked participants to “keep in mind the higher-level goals their current goals were serving” (Sheldon et al., 2002, p. 8), underlying a belief that making this connection explicit would help facilitate participants’ goal attainment. The current study explicitly measured whether participants’ actually articulated high order or low order goals before engaging in GAS, and drew an empirical connection between this articulation and participants’ subsequent goal attainment. The results raise a number of interesting questions.

Participants Choosing Low Order Goals. For participants who chose low order goals and did not receive coaching, this study found that those that did not receive GAS achieved

higher goal attainment than those who did receive GAS. Why did this occur? What is it about the GAS process that may inhibit these participants' goal attainment? The answer may lie in the steps one takes when creating GAS charts.

The eight step procedure for creating GAS charts identified by Spence (2007) begins with an identification of an overall objective and then an articulation of specific goals that would support this object. It is possible that the GAS technique works more effectively when the structured conversation flows in this manner, from high order goals to low order goals, rather than in the reverse direction. If a participant intuitively begins the process by articulating a low order goal, perhaps the GAS process of connecting this specific goal to the larger, super-ordinate objective causes the participant to reevaluate whether or not they want to pursue that specific goal. High order goals by definition have multiple sub-goals underneath them and perhaps "going in reverse" weakens a participant's resolve to pursue a singular low order goal since he or she becomes aware of multiple small goals that could be pursued to achieve the larger objective. Instead of focusing on achieving this singular goal, such participants may exert cognitive resources revisiting the question of whether the pursuit of the goal is in fact worthwhile. This is what goal attainment researchers label as going from an "implementation" mindset back to a "deliberative" one (Gollwitzer & Brandstatter, 1997).

Furthermore, it is also possible that these participants expend energy pursuing a number of related goals in addition to the original low order goal they identified. Since their attention is divided, this would likely result in a lower goal attainment score for the individual goal, but progress could also be measured on numerous other related goals. This possibility was not examined in the current study and would need to be confirmed by future research. In the end, since participants' pursuit of the goal they articulated was found to be stable, it is likely that the

GAS process did not completely derail participants who articulated low order goals. However, the results of this study do indicate that GAS may not facilitate goal attainment for these participants without additional support.

For participants who chose low order goals and did receive coaching, GAS yielded higher goal attainment relative to those who did not experience GAS. Building on the rationale discussed above, it is possible that the coaching that these GAS participants received helped them work through the added complexity that going in “reverse” may have caused. Coaching is a client-centered process that, in part, provides a supportive space for reflection and learning. Participants may have used this space to work through the additional questions that the GAS process may have stimulated. In fact, the combination of coaching with GAS for participants who chose low order goals resulted in the highest goal attainment change scores relative to participants in any other condition. So perhaps the comprehensive exercise of connecting low order goals to higher order goals and working through the complexity of going “in reverse” with the support of the coach is in fact the most effective approach to facilitating goal attainment. Future research is required to confirm that this finding holds true for other coachees, and if so, to identify exactly what aspects of coaching complements the GAS process so well for these participants.

Participants Choosing High Order Goals. For participants who chose high order goals, and did not receive coaching, this study found that GAS resulted in higher goal attainment relative to participants who did not receive GAS. This finding is not surprising since GAS was designed to help participants convert their high order goals into desirable specific behaviors. Participants in the No-GAS condition did not receive support in identifying desired behaviors that would support their overall goal. Thus participants in the No-GAS condition may have had

more trouble converting their big picture objectives into concrete actions. This difference likely accounts for the discrepancy detected in goal attainment between these two conditions.

For participants who chose high order goals and did receive coaching, this study found that No-GAS worked better than GAS in facilitating goal attainment. In other words, for these participants coaching as a “stand alone” intervention worked better than the combination of GAS and coaching. Why is this so? What is it about the combination of coaching and GAS that appears to undermine the goal attainment of participants who choose high order goals to pursue? Frankly, this finding is challenging to explain. Perhaps the two interventions in this circumstance are working cross purposes in that GAS is focusing participants on micro behaviors while coaching is focusing participants on the big picture. Regardless, future research is required to understand why the two interventions may not complement one another in this circumstance, and to determine if this finding was in fact an anomaly.

The Role of Conscientiousness. Another major contribution of this study was the finding that depending on whether or not participants were highly conscientious, and whether or not they were supported with additional coaching, the GAS technique yielded different results. This study found that conscientiousness significantly predicted participants’ goal attainment. This connection was not surprising given previous empirical research: a significant body of studies have found that more conscientious individuals are more likely to attain their goals (e.g., Klein & Lee, 2006). Additionally, conscientiousness has been related to coaching outcomes. Specifically, the personality characteristic was found to be associated with greater application of learning from coaching engagements, and higher maintenance of coaching outcomes (Stewart et al., 2008). Thus, it is not surprising that conscientiousness was predictive of goal attainment in

this study. The more nuanced relationship found between all three variables – conscientiousness, coaching, and GAS – is now addressed.

High conscientious participants. For highly conscientious participants who did not receive coaching, GAS facilitated higher goal attainment change scores relative to the No-GAS condition. Highly conscientious participants have a propensity for carrying out tasks and being determined (Costa & McCrae, 2002), and therefore these participants may have benefited from the identification of concrete behaviors that the GAS process provides. In other words, GAS may have given these highly conscientious participants clearer “marching orders” to channel their efforts relative to those who did not receive GAS. Highly conscientious participants in the No-GAS condition may have worked hard, but without the specific focus provided by GAS they perhaps were not able to channel their energy as effectively towards attaining their goal.

For highly conscientious participants who received coaching, this study found that those that did not receive GAS achieved higher goal attainment than those who did receive GAS. It is possible that the GAS process in this context was redundant with coaching, and did not provide additional benefit over and beyond the coaching intervention. Like GAS, coaching is a goal-focused process (Grant, 2003), and perhaps highly conscientious participants only require some support in order to achieve their goals since they already have good habits related to goal attainment. Substantiating the notion that only some support is necessary for this population is the fact that the highest goal attainment scores were achieved in the “coaching only” condition. Furthermore, the next highest goal attainment was achieved by participants in the “GAS only” condition. However, when the two interventions were combined, the goal attainment change scores were not as high for these participants. Future research is required to investigate why the

combination of interventions may not only have been redundant, but also perhaps interfered with goal attainment for this population.

Low conscientious participants. For low conscientious participants who received coaching, GAS facilitated higher goal attainment change scores than for participants who did not experience GAS. In other words, this population appeared receptive to the combination of GAS and coaching, since participants who received both interventions achieved higher goal attainment than participants who only received coaching. In fact, low conscientious participants who were supported by both GAS and coaching scored the highest goal attainment change score relative to participants in any other condition. Unlike highly conscientious participants, this population lacks a strong propensity for completing tasks and therefore they may require a lot of support to achieve their goals. Specifically, GAS may help this population identify desired, concrete behaviors, while coaching may help keep these participants on track (e.g., by helping overcome obstacles, keeping them accountable, etc.). This study's findings suggest that when low conscientious participants do in fact receive this support they are capable of achieving even greater goal attainment than highly conscientious counterparts. Future research is required to determine if this pattern occurs consistently, and why exactly the combination of interventions works so well with this population.

For low conscientious participants who did not receive coaching, those that did not receive GAS achieved higher goal attainment than those that did receive GAS. Why did this occur? Why is that GAS appeared to undermine the achievement of low conscientious participants? Since low conscientious participants by definition do not have strong habits relating to goal attainment, it is possible that the structured GAS conversation unintentionally undermined their achievement. This may have occurred since GAS identified desirable specific

behaviors but the process did not provide additional support or help participants overcome obstacles that inevitably appear. Future research is required to determine if in fact low conscientious participants get demoralized from the GAS process if they do not receive additional coaching support.

Limitations

The two biggest drawbacks to the current study were (1) that it was not possible to randomly assign participants to the coaching condition, and (2) that it was not possible to control variance across coaching interventions. These drawbacks were the downside to using a sample of convenience. As the reader may recall, this study's sample was affiliated with the Hudson Institute of Santa Barbara, a premier coaching institution. As such, this study enlisted the participation of students who were already receiving coaching as part of their curriculum at the institute. Given the difficulty of finding a sample, and the complexity associated with recruiting coaches to provide coaching services to a large number of participants, it was decided that this trade-off was worthwhile.

This study's sample of convenience also hampered plans to create equal groups for the coaching and non-coaching conditions, since a number of the "non-coaching" participants were discovered to in fact be receiving coaching related to their goals. Given the difficulty of recruiting participants, it was decided that unequal groups would be tolerated. A drawback to this decision is that the non-coaching group became particularly small, and thus more vulnerable to random error and less generalizable to the population at large.

In fact, overall, this sample may not necessarily represent the population at large that is currently receiving coaching. For example, it is not clear whether or not the level of conscientiousness measured in the sample is approximately equivalent to the population

receiving coaching at large. It is possible that students interested in a helping profession are in fact more conscientious than the general population receiving coaching. It is also possible that many coaching recipients are low conscientious individuals who seek to improve their goal attainment habits. If this is the case, then this study's finding that GAS works best as a "stand alone" intervention for highly conscientious participants may not be very useful since many coachees may in fact be low conscientious individuals. Until more research is conducted on the people providing and receiving coaching, the generalizability of the findings are difficult to purport.

Similarly, the average age of this sample was 54 years, which likely makes them somewhat older than the general population receiving coaching. On the other hand, this sample's age is likely similar to the population receiving executive coaching. These likelihoods are difficult to confirm without known reference points of the populations receiving coaching. However, it is possible that older people set different types of goals. As stated earlier, a number of the personal goals set by this sample were health related, which may be of greater concern to an older population. Since GAS was not found to be as effective with personal goals, it would be interesting to see if in fact the technique works better with a younger population. It would also be interesting to see if GAS was found to be effective for personal goals set by a younger population. Finally, the connection between a coachee's age and goal attainment is also worthy of future exploration since although younger people have less experience setting and achieving goals, they may be more open to the changes required for achievement.

Another unique characteristic of this study's sample is that they are more informed about professional coaching than most coachees. Specifically, given the importance of goals in coaching, this study's participants likely know more about the characteristics of effective goals

(e.g., the importance of setting specific, difficult, but achievable goals). Given their training they are also more likely to value striving to make positive changes. Therefore, this sample may be more likely to achieve their goals than the general population. Furthermore, given their training, they may articulate low order goals more frequently than the general population. If true, this study's finding that GAS and coaching work best in tandem with low order goals may be of limited usefulness. In fact, both GAS and coaching would be of limited usefulness to all people who are adept at self-regulating their behavior since they would require less support to achieve their goals.

A number of issues related to the way coaching was enacted may have also influenced the results of this study. First it is possible that coaches may have varied their approach. A uniform approach to coaching would make it easier to interpret some of this study's results. For example, it would be easier to discover why highly conscientious participants thrived in the "coaching only" condition relative to the "GAS only." Currently it is easy to understand the GAS only condition since it was enacted by a single researcher, and has a more limited and clearly defined procedure. Overall, the impact of coaching on participants' goal attainment is easier to decipher when a clear uniform approach is taken.

Another related potential threat to the current study's findings was that the goals set by participants did not necessarily align with the coaching they were receiving. It stands to reason that goals that are aligned with coaching are more likely to be achieved. Therefore, if participants in the coaching condition but were not in fact receiving coaching that aligned with their goals or the GAS chart they created, perhaps it would have been more appropriate from a research design perspective to place them in the non-coaching condition.

A final number of issues relate to the approach used by this study's coaches. The current study utilized a coaching approach by the Hudson Institute. Briefly, the Hudson coaching approach takes a "whole person" developmental approach to understanding the "current situation," helps coachees identify a desired future state, and supports them in overcoming obstacles to their goals. In fact, the Hudson coaching approach is embedded with some goal-setting procedures that the GAS process entails. So, both of this study's interventions, GAS and coaching, identify desirable goals and new behaviors associated with their achievement. Therefore, upon reflection, participants in No GAS-Yes Coaching condition may have been receiving some of the GAS treatment inadvertently. Future research seeking to compare "pure coaching" to "pure GAS" may want to take into consideration that the two interventions may in fact overlap to a certain extent.

Theoretically, this study's results would not necessarily generalize to coaching approaches other than the Hudson Institute's approach. GAS may be more or less complementary to coaching approaches advocated by different institutions. Given GAS's focus on observable behaviors, the technique likely works well with solutions-focused, evidence-based coaching methodologies. It may complement problem-solving coaching approaches as well since GAS does not explicitly address how specific goals are to be enacted nor does it provide strategies to overcome obstacles, which is what the coach would focus on. Finally, GAS may be somewhat antithetical to coaching that focuses on transformational change, since the GAS process is linear and transformation is inherently difficult to measure.

This study also exhibited a number of additional potential weaknesses. The self-report nature of the goal attainment measure raises concerns about the influence of social desirability on this study's results. Social desirability pressures may have led participants to inflate their

estimates of goal progress. Yet it is also true that this study obtained adequate variance and no ceiling effects on the goal attainment measures.

The presence of the researcher may have also had another unintended impact on study participants, similar to the effect of social desirability. It is possible that participants chose “safer” goals as part of this study than they would have had they been engaging in a more private coaching relationship. In other words, perhaps coachees would chose goals that are more intimate, or goals that are more related to shoring up their vulnerabilities or weaknesses, if they didn’t have to “declare” them to an outside researcher. That being said, the confidentiality of the conversations was emphasized to all participants, and a number did share goals that were private and clearly very important to current challenges they were facing. For example, one participant chose a goal to have conversations with people about the “fundamental questions” she was having regarding the spiritual faith she inherited – a topic that filled her with emotion and was clearly sensitive given the doubts that she was experiencing.

An additional weakness to this study’s methodology relates to the dependent variable, total goal attainment. As a self-report variable, no independent verification of goal progress was utilized. More varied and objective sources of evidence to measure goal attainment would strengthen its validity and reliability. However, such verification would likely required additional human resources, such as the inclusion of a work-place supervisor or peer that could act as a “referee” with regards to goal progress.

An additional related weakness was that the dependent variable total goal attainment was measured by one item. This is common practice in research on goal progress (e.g., Stewart et al., 2008), but future research would benefit from finding ways to use multiple questions to assess

the extent of one's progress towards their goals. This would allow for the creation of a goal attainment scale, whose internal reliability could be assessed and compared across studies.

The final weakness of this study was the sample size of 48 participants. Although the size aligns with the bulk of empirical coaching studies done to date, such a size makes it difficult to detect effects on the dependent variable. Consequently, one may fear that the numerous non-significant findings detected by this study may be Type 2 errors related to the lack of power such a sample size provides. In other words, this study may have missed the existence of significant relationships as hypothesized because the sample size was too small.

Future Research

Future research should utilize larger sample sizes to retest the core and ancillary hypotheses of this study. The non-significant trends of group means in hypothesized directions suggest that many of these inquiries remain potentially fruitful; most notably, that GAS may enhance the goal attainment of participants.

Furthermore, additional parameters for GAS should be explored, including whether or not the technique works better for different types of goals. Does the behavioral focus and structured method of GAS not lend itself well to goals that are personal, as the current results suggest? In other words, does the GAS process feel too "emotionally detached" for the pursuit of certain types of goals? Conversely, what is it about career-related goals that make them appear to work better with GAS? Future research may also benefit from further differentiating career goals into two categories: performance goals versus professional development goals.

Performance coaching focuses on assisting clients achieve a specific goal or level of performance. Developmental coaching focuses on assisting clients learn new habits or skills. Of course there is an element of client development and progress making in all forms of coaching,

however, developmental goals usually take longer to achieve than performance goals since they may require unearthing assumptions, unlearning old habits, as well as learning and practicing new ways of being and doing (Cox & Jackson, 2010). Given the complexity involved with developmental goals, Goal Attainment Scaling is likely a tool better suited to aid performance goals.

Future research is also required to address questions related to the individual differences of GAS participants. This study was the first to find that the effectiveness of GAS varies based on an individual difference variable, conscientiousness. Additional research should examine this and other individual difference variables rather than assume that GAS works equally effectively with all participants. For example, given the frequency with which the Myers-Briggs Type Indicator is utilized in coaching contexts, it would be interesting to see if GAS is more effective in facilitating the goal attainment of Sensing (S) and Thinking (T) participants relative to Intuiting (N) and Feeling (F) participants. On the one hand, the logical structure inherent to GAS may be more compatible with the way S-T's process information and make decisions. On the other hand, N-F's may in fact benefit more from this "counter-preference" intervention since goal attainment is linked to setting specific challenging goals, which while inherent to GAS, may not come naturally to this personality type.

Finally, additional research should examine the tendency of coachees to articulate high order goals versus low order goals. This study demonstrated that people do not all articulate goals at the same level, and that this has consequences to interventions designed to enhance their goal attainment.

Implications

This study has a number of practical implications regarding the use of GAS in a coaching context. First, it is important for coaches to notice whether or not their coachees are pursuing high or low order goals. If coachees articulate higher order goals, then coaches may consider using a GAS technique to help them attain their goals since the technique appears to be effective and efficient in such circumstances (e.g., no additional coaching support required). If coachees articulate lower order goals, then coaches who wish to use the GAS technique may need to provide additional support to obtain similar results.

Second, it is important for coaches to assess the level of conscientiousness of their clients. This can be done fairly easily with a ten-item questionnaire, such as the one utilized in this study. For their highly conscientious clients, coaches may not need to create a GAS chart to help them to attain their goals. On the other hand, coaches will likely benefit from using the procedure with their clients who are less conscientious, and they can expect that additional support will be required to help these clients achieve their goals.

Third, the results of the current study suggest that GAS may work best for clients pursuing career-related goals, rather than personal ones. The tool therefore may be utilized more effectively by workplace or executive coaches, rather than life coaches. Regardless, it was the experience of this researcher that GAS worked best when the steps guided a naturally flowing conversation, rather than forcing a highly-structured, step-by-step procedure that was followed rigidly.

Conclusion

Overall, GAS is a coaching technique that does something very specific in about 15 minutes: it connects a participant's big picture goal to a supportive concrete behavior, and it

provides a range of potential outcomes. GAS charts thus ensure that goals pursued by coachees are specific and observable, making them a useful way to see goal progress. Many coaches are already having these types of goal conversations with their clients, but these conversations may benefit from the systematic approach that the formal GAS process requires. Depending on the context, this study demonstrates that an additional benefit to engaging in GAS may be that the process actually facilitates participants' goal attainment. Like any intervention, however, GAS is not effective with all participants in all settings. The current study suggests that it is critical to understand the types of goals a client is pursuing, as well as aspects of the client's personality, before embarking on a GAS intervention.

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Table 1.

Eight Step Procedure for Creating GAS Chart (adapted Ottenbacher & Cusick, 1990; Spence 2007)

1. Identify overall objective	Participant and researcher discuss and agree on the general goal they will pursue (e.g. become more social)
2. Identify specific problem areas to be addressed	Requires prioritization of problem areas (e.g. not socializing enough) and reduction to observable and reportable components (e.g. frequency of social interactions).
3. Identify behaviors that would indicate improvement	Involves outlining the operational detail needed for the scale to be a useful instrument in evaluating performance (e.g. increasing the number of daily conversations one initiates).
4. Determine how goal attainment will be measured	Decisions made regarding the collection of goal attainment data: Who will collect it? In what setting it will be gathered? (e.g. participant will journal progress every evening before going to sleep, or participant will document progress on goal chart once a week during coaching session).
5. Select 'Expected Outcome' level of performance	A critical step. Both the participant and researcher appraise and agree on a level of attainment that is both meaningful and realistic for the participant given their history and current situation.
6. Identify alternative levels of attainment	In addition to the 'Expected Outcome', four other levels of attainment are identified in order to quantify greater and lesser levels of performance.
7. Check for overlap between levels	Overlapping goals can be used but they must be goals and gaps mutually exclusive and internally consistent. Gaps between levels are not permissible and can be addressed by defining a behavioral range for each goal level.
8. Ascertain current level of attainment	Discuss past and present goal attainment with the participant to determine the GAS level that is 'current'. A timetable for future evaluations should also be agreed at this point.

Table 2.

Sample Sizes of Coaching Outcome Studies Utilizing a Randomized Between-Subjects Design

Author (year of publication)	Sample size	Sample description
Deviney (1994)	45	Line supervisors
Taylor (1997)	N/A	Participants in MCAT preparatory program
Grant (2002)	62	Trainee accountants
Miller et al. (2004)	140	Licensed professionals
Bennet & Perrin (2005)	111	Older adults
Gattellari et al. (2005)	277	General practitioners
Green et al. (2006)	56	Adults in a community program
Green et al. (2007)	56	Female high school students
Spence & Grant (2007)	63	Adults in a community program
Duijts et al. (2007)	151	Employees from health care sector
Spence et al. (2008)	45	Adults in a community program
Grant et al. (2009)	41	Executives in public health agency

Note. The sample size for Taylor (1997) was not available since it is an unpublished dissertation.

Table 3.
Frequency Table for Independent and Demographic Variables

Variable		<i>n</i>	%
GAS	GAS	25	52
	No GAS	23	48
Coaching	Coaching	32	66
	No Coaching	16	33
Gender	Female	27	56
	Male	21	44
Race	Caucasian	43	90
	African American	3	6
	Hispanic or Latino	1	2
	Other	1	2
Employment Status	Full Time	35	73
	Part Time	8	17
	Unemployed	5	10
Age	70 to 51 years	32	68
	50 to 31 years	16	32

Note. The mean age of participants was 54 years with a standard deviation of 6.9 years.

Table 4.
Frequency Table for Demographic Variables in Coaching and No Coaching conditions

Demographic Variable	Coaching	No Coaching
Average age	51 yrs.	55 yrs.
Race		
Caucasian	91%	88%
Non-Caucasian (African American, Hispanic or Latino, or other)	9%	12%
Employment Status		
Full Time	75%	69%
Part Time or Unemployed	25%	31%
Gender		
Male	50%	38%
Female	50%	62%

Table 5.
Time 1 and Time 2 Variables Assessed in Each Condition

	Condition			
	Yes GAS - Yes Coaching	Yes GAS - No Coaching	No GAS – Yes Coaching	No GAS - No Coaching
Time 1				
Goal Attainment	X	X	X	X
Perceived competence	X	X	X	X
Planning	X	X	X	X
Commitment	X	X	X	X
Time 2				
Goal Attainment	X	X	X	X
Goal Self Concordance	X	X	X	X
Conscientiousness	X	X	X	X
Goal stability	X	X	X	X
Goal opportunity	X	X	X	X
Coaching sessions and coach experience	X		X	

Note. The “X” symbol indicates that the variable was assessed.

Table 6.
Correlations of Demographic Variables with Total Goal Attainment

Demographic Variable	Total Goal Attainment	P-Value
1. Age	-.07	.63
2. Employment Status	-.06	.70
3. Gender	.27	.07

Note. *N* ranged from 47 to 48 subjects. Correlations are 2-tailed. Employment status was coded “0” for unemployed, “1” for employed, and “0.5” for part-time employment. Gender was coded “0” for female and “1” for male.

Table 7.
One way ANOVA of Race on Total Goal Attainment

	Sum of Squares	df	Mean Square	F	P-Value
Between Groups	15300.24	3	5100.08	46.89	.88
Within Groups	1015628.09	44	23082.46		
Total	1030928.33	47			

Note. *N* equaled 48 subjects. Race was coded “1” for Caucasian, “2” for African American, “3” for Hispanic or Latino, and “4” for Other.

Table 8.
Means, Standard Deviations, and Intercorrelations of Variables

Variable	Mean	SD	Range	Max/Min	1	2	3	4	5	6	7	8	9	10	11
1. Total Goal Attainment	160.91	148.10	750.00	500/-250											
2. GAS	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	.02										
3. Coaching	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	.13	-.13									
4. Conscientiousness ^a	5.50	.77	3.80	6.4/2.6	.21	.11	.09								
5. Goal Self Concordance ^a	5.37	4.84	18.00	12.0/-6.0	-.16	-.13	.01	.25							
6. Planning ^a	4.74	1.25	4.88	6.9/2.0	-.03	.06	-.07	.41**	.31*						
7. Perceived Competence ^a	5.98	.70	2.75	7.0/4.3	.13	-.01	.14	.14	.18	.23					
8. Goal Commitment ^a	6.37	.67	2.60	7.0/4.4	.36**	.12	.18	.48**	.28*	.31*	.29*				
9. Total Goal Attainment Retro ^b	186.04	140.43	750.00	500/-250	.82**	.06	.22	.28*	-.17	.05	.11	.31*			
10. Goal Type ^b	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	.14	.09	.10	-.07	-.28*	-.08	-.20	.09	.16		
11. Goal Order ^b	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	<i>n/a</i>	-.16	.08	-.02	.19	.06	-.24*	-.05	.24*	-.20	.13	

Note. *N* equaled 48 subjects. * < *p* = .05. ** < *p* = .01. *n/a* symbol indicated "not applicable."^a symbol indicates variables used a Likert scale ranging from 1 = Strongly Disagree to 7 = Strongly Agree. ^b symbol indicates variables that were used for exploratory analyses. GAS was coded "0" for participants who did not receive GAS and "1" for participants who did. Coaching was coded "0" for participants who did not receive coaching and "1" for participants who did. Goal Type was coded "0" for participants who chose "personal" goals and "1" for "career" goals. Goal Order was coded "0" for low order goals and "1" for high order goals.

Table 9.
Cell Mean and Standard Deviation for the Main Effect of GAS and Coaching on Total Goal Attainment

	No Coaching	Yes Coaching
No GAS	133 (117) <i>N</i> = 8	172 (156) <i>N</i> = 15
GAS	140 (138) <i>N</i> = 11	181 (171) <i>N</i> = 14

Note. Standard deviations appear in parentheses. *N* equaled 48 total subjects. Although cell means are in the hypothesized directions, the *F* value for main effects and interaction term were not significant at $p < .05$.

Table 10.
Mediator Means in GAS and No-GAS Condition

	GAS	No-GAS	<i>t</i>	<i>df</i>
Perceived Competence	5.98 (.64)	5.99 (.77)	.07	42
Planning	4.81 (1.50)	4.67 (.92)	-.40	42
Goal Commitment [†]	6.45 (.55)	6.28 (.79)	-.84	41

Note. Standard deviations appear in parenthesis below means. Independent samples t-test above was not significant at $p < 0.05$. [†]Indicated Levine's test for equality of variances was significant at $p = .05$, therefore equal variances could not be assumed.

Table 11.

Regression Table for GAS and Goal Self Concordance (GSC) predicting Total Goal Attainment

Variable	Beta	t	p-value
Constant		3.6	.001
GAS	.04	.16	.871
GSC	-.13	-.56	.568
GAS*GSC	-.07	-.25	.804

Note. Standardized coefficients are presented. R Square for the regression equaled .028.

Table 12.

Regression Table for GAS and Conscientiousness predicting Total Goal Attainment

Variable	Beta	t	p-value
Constant		-.87	.393
GAS	.99	.90	.372
Conscientiousness	.32	1.69	.099 ¹
GAS*Conscientiousness	-1.02	-.92	.364

Note. Standardized coefficients are presented. R Square for the regression equaled .061.

¹ Indicates p-value approached significance at 0.10 level.

Table 13.

Regression Table for GAS, Coaching, and Conscientiousness predicting Total Goal Attainment

Variable	Beta	t	p-value
Constant		1.08	.288
GAS	-1.81	-.94	.352
Coaching	-2.77	-1.58	.122
Conscientiousness	-0.36	-.81	.426
GAS * Coaching	4.80	1.92	.062 [†]
GAS * Conscientiousness	1.90	.96	.344
Coaching * Conscientiousness	3.04	1.69	.099
GAS * Coaching * Conscientiousness	-5.02	-1.95	.058 [†]

Note. Standardized coefficients are presented. R Square for the regression equaled .023.

[†]Indicates p-value approaches significance at .05 level.

Table 14.

Cell Mean and Standard Deviation for the Main Effect of GAS and Coaching on Retrospective Total Goal Attainment

GAS	Coaching	
	<i>No Coaching</i>	<i>Yes Coaching</i>
<i>No GAS</i>	169 (102) <i>N</i> = 8	183 (158) <i>N</i> = 15
<i>Yes GAS</i>	132 (133) <i>N</i> = 11	242 (138) <i>N</i> = 14

Note. Standard deviations appear in parentheses. *N* ranged from 8 to 15 per cell. Although some of the cell means are in the hypothesized directions, the *F* value for main effects and interaction term were not significant at $p < .05$.

Table 15.

Goals Pursued by Participants Organized by Type

Career goals relate to performance improvement, professional development (including school work), financial management, finding work, and other issues related to work.

1. Convert visitors from my website into actual collaborative divorce clients.
2. Getting a paying project by setting up in-person meetings with gate keepers.
3. Be more intentional regarding my time-management to focus on “mission critical” issues at work.
4. Find a satisfying new job (journal my networking efforts and other progress).
5. Enhance my influence at work with tolerance, patience, and openness when disagreements occur.
6. Pass the California Basic Skills Test.
7. Invest an hour a day in getting legal-financial documents and plan in order.
8. Continually refocus on my priorities – spend an hour a day on my top 3 work priorities.
9. Achieve greater clarity about next career move (includes reading, meetings, networking).
10. Complete my school portfolio.
11. Reach clarity on a path to support my family financially and reward me professionally.
12. Make progress on identifying the purpose of the next chapter of my life.
13. Become a visionary leader by demonstrating specific, strategic behaviors in my weekly meetings.
14. Complete my course requirements over the next four weeks.
15. Make progress towards completing my portfolio.
16. Complete my oral presentation in four weeks by following my time management plan.
17. Get clarity about my next career steps.
18. Be more efficient in my time-management to accomplish competing priorities at work.
19. Continue developing executive presentation skills by getting feedback and measuring success.
20. Build my assertiveness (defend my rights and POV in a confident, non-destructive manner).
21. Complete a high-learning portfolio despite schedule constraints by investing time regularly.
22. Complete my initial “core purpose” statement.

Personal goals relate to health, exercise, diet, work-life balance, and other activities intended to nurture one’s personal life.

1. Fitness goal to increase cardio workout (# of days, times, and intensity)
 2. Lose 5pounds total over the next four weeks.
 3. Exercise 3 times a week on my own for 30 minutes.
 4. Improve work-life balance (more time for family; care for self; winning over my schedule)
 5. Lose weight – be fittest ever!
 6. Lead a more organized, self-nurturing life-style.
 7. Achieve a goal weight of 138 lbs. by adding 2 cardio sessions per week and eliminating alcohol.
 8. Create healthy foundational environment for my life via diet, yoga classes, and acupuncture.
 9. Begin setting up a Pilates studio by investing time regularly in various related tasks.
 10. Dedicate one hour a day for reading reflection, contemplation, and uninterrupted quiet time.
 11. Create a healthier body by losing weight, ideally 8 lbs. in four weeks.
 12. Keep a fitness goal of 5 days a week despite an intense work/travel schedule.
 13. Begin exploring Buddhism.
 14. Lose 5 lbs. by exercising regularly in 20 minutes increments.
 15. Improve my work-life balance and take better care of myself.
 16. Lead a healthier life by exercising regularly for 20-45 minute sessions.
 17. Rediscover my creative side by playing and writing music daily.
 18. Be less challenged by negative thinking by maintaining a “noticing” log regularly.
 19. Reflect on my life accomplishments (write a paragraph or two each of my top 5).
 20. Continue exploring my spirituality by having 3 to 5 conversations re: “fundamental questions.”
 21. Work on my “joy factor.”
 22. Create a better “tempo” for my life
 23. Improve my work-life balance by limiting my hours at work.
 24. Improve my time-management and work-life balance.
 25. Lose 5-10 lbs. over the next 4 weeks by regularly keeping a food diary.
 26. Invest in my overall health and fitness by increasing my daily number of steps taken.
 27. Give up refined sugar.
 28. Improve my overall health by consistently maintaining blood sugar level below 120.
-

Note. The goals listed are the ones participants provided during Time 2. Personal goal number 1 listed above changed from a writing goal to a fitness goal at Time 2. The data collected for Goal Attainment Retro used the fitness goal, since the Time 1 data related to the writing goal was no longer relevant.

Table 16.
Goals Pursued by Participants Organized by Order

High Order goals address the “big picture” and are under pinned by sub-goals.

1. Writing goal to formulate ideas into a book, article, or workshop.
2. Convert visitors from my website into actual collaborative divorce clients.
3. Getting a paying project.
4. Improve work-life balance (more time for family; care for self; winning over my schedule)
5. Lose weight – be fittest ever!
6. Lead a more organized, self-nurturing life-style.
7. Find a satisfying new job.
8. Create healthy foundational environment for my life via diet, yoga classes, and acupuncture.
9. Pass the California Basic Skills Test.
10. Get my legal, financial documents and plan in order.
11. Emerge as a leader at work.
12. Begin exploring Buddhism.
13. Improve my work-life balance and take better care of myself.
14. Achieve greater clarity about next career move (includes reading, meetings, networking).
15. Be less challenged by negative thinking.
16. Continue learning and exploring my spirituality.
17. Reach clarity on a path to support my family financially and reward me professionally.
18. Work on my “joy factor.”
19. Create a better “tempo” for my life.
20. Make progress on identifying the purpose of the next chapter of my life.
21. Get clarity about my next career steps.
22. Invest in my overall health and fitness (physical, nutritional, exercise, heart rate, weight, sleep).
23. Improve my overall health.
24. Continue developing executive presentation skills.
25. Become a visionary leader.
26. Improve my work-life balance.
27. Be efficient in my time-management to accomplish competing priorities.
28. Improve my time-management and work-life balance.
29. Build my assertiveness (defend my rights and POV in a confident, non-destructive manner).

Low Order goals are easily measurable in that they are specific, behavioral, and quantifiable.

1. Lose 5pounds total over the next four weeks.
 2. Exercise 3 times a week on my own for 30 minutes.
 3. Achieve a goal weight of 138 lbs. by adding 2 cardio sessions per week and eliminating alcohol.
 4. Be more intentional regarding my time-management by focusing on “mission critical” issues at work.
 5. Invest time regularly in various tasks related to setting up a Pilates studio.
 6. Dedicate one hour a day for reading reflection, contemplation, and uninterrupted quiet time.
 7. 8 lbs. weight loss goal.
 8. Keep a fitness goal of 5 days a week despite an intense work/travel schedule.
 9. Lose 5 lbs.
 10. Continually refocus on my priorities – spend an hour a day on my top 3 work priorities.
 11. Lose about 7 lbs over the next month.
 12. Play and write music daily.
 13. Reflect on my life accomplishments (write a paragraph or two each of my top 5)
 14. Complete my school portfolio.
 15. Complete my course requirements over the next four weeks.
 16. Lose 5-10 lbs. over the next 4 weeks.
 17. Complete my oral presentation in four weeks.
 18. Give up refined sugar.
 19. Complete a high-quality learning portfolio despite major time constraints.
 20. Complete initial core purpose statement.
 21. Make progress towards completing my portfolio.
-

Note. The goals listed are the ones participants provided during Time 1 before the GAS intervention.

Table 17.
Frequency Table for Exploratory Variables

Variable		Frequency	Percent
Goal Type	<i>Total</i>	50	100
	<i>Personal Goals</i>	28	56
	<i>Career Goals</i>	22	44
Goal Order	<i>Total</i>	50	100
	<i>High Order</i>	29	58
	<i>Low Order</i>	21	42

Table 18.
2 x 2 ANOVA Table for Coaching and Type predicting Total Goal Attainment

Variable	df	Mean Square	F	p-value
Corrected Model	3	9952.38	.44	.73
Intercept	1	1090141.62	47.92	.000*
Coaching	1	10406.97	.46	.50
Type	1	11214.66	.49	.49
Coaching * Type	1	2236.30	.10	.76
Error	44	22751.62		
Total	48			
Corrected Total	47			

Note. Standardized coefficients are presented. * $p < 0.05$. R Square for the regression equaled 0.03.

Table 19.
2 x 2 ANOVA Table for Coaching and Type predicting Retrospective Total Goal Attainment

Variable	df	Mean Square	F	p-value
Corrected Model	3	25398.22	1.31	.28
Intercept	1	1466897.09	75.88	.000*
Coaching	1	25190.146	1.30	.260
Type	1	25741.179	1.33	.255
Coaching * Type	1	10733.697	.55	.460
Error	44	19332.24		
Total	48			
Corrected Total	47			

Note. Standardized coefficients are presented. * $p < 0.05$. R Square equaled 0.08.

Table 20.

Regression Table for GAS, Coaching, and Type predicting Retrospective Total Goal Attainment

Variable	Beta	t	p-value
Constant		2.982	.021*
GAS	-.268	-.979	.333
Coaching	.236	.947	.349
Type	.181	.574	.569
GAS * Coaching	.097	.287	.776
GAS * Type	.212	.629	.533
Coaching * Type	-.455	-1.232	.225
GAS * Coaching * Type	.371	.991	.327

Note. Standardized coefficients are presented. * $p < 0.05$.

Table 21.
Regression Table for GAS, Coaching, and Type predicting Total Goal Attainment

Variable	Beta	t	p-value
Constant		2.40	.021*
GAS	-.200	-.686	.497
Coaching	.199	.750	.458
Type	-.120	-.359	.722
GAS * Coaching	-.040	-.110	.913
GAS * Type	.454	1.265	.213
Coaching * Type	-.081	-.207	.837
GAS * Coaching * Type	.027	.068	.946

Note. Standardized coefficients are presented. * $p < 0.05$.

Table 22.
Regression Table for GAS, Coaching, and Order predicting Total Goal Attainment

Variable	Beta	t	p-value
Constant		2.62	.012*
GAS	-.47	-1.32	.195
Coaching	-.153	-.426	.672
Order	-.501	-1.319	.195
GAS * Coaching	.677	1.946	.059 ¹
GAS * Order	.663	1.809	.078 ¹
Coaching * Order	.368	1.002	.322
GAS * Coaching * Order	-.882	-2.342	.024*

Note. Standardized coefficients are presented. R Square for the regression equaled 0.18.

¹Indicates p-value approaches significance at .05 level. * $p < 0.05$.

Goal 1	
Higher order goals	<u>'Become more social'</u>
Lower order goals	Increase number of social interactions to overcome shyness
GAS Levels	
Best expected outcome	Initiate conversation (min 5 min) with >4 new people per day
More than expected outcome	Initiate conversation (min 5 mins) with 3-4 new people per day
Expected outcome	Initiate conversation (min 5 mins) with 2 new people per day
Less than expected outcome	Initiate conversation (min 5 mins) with 1 new person per day
Worst expected	No conversations with anyone new (C)

Figure 1. An example GAS chart created following the eight step procedure (Spence, 2008).

The “(C)” on the chart indicates the participant’s current level of attainment.

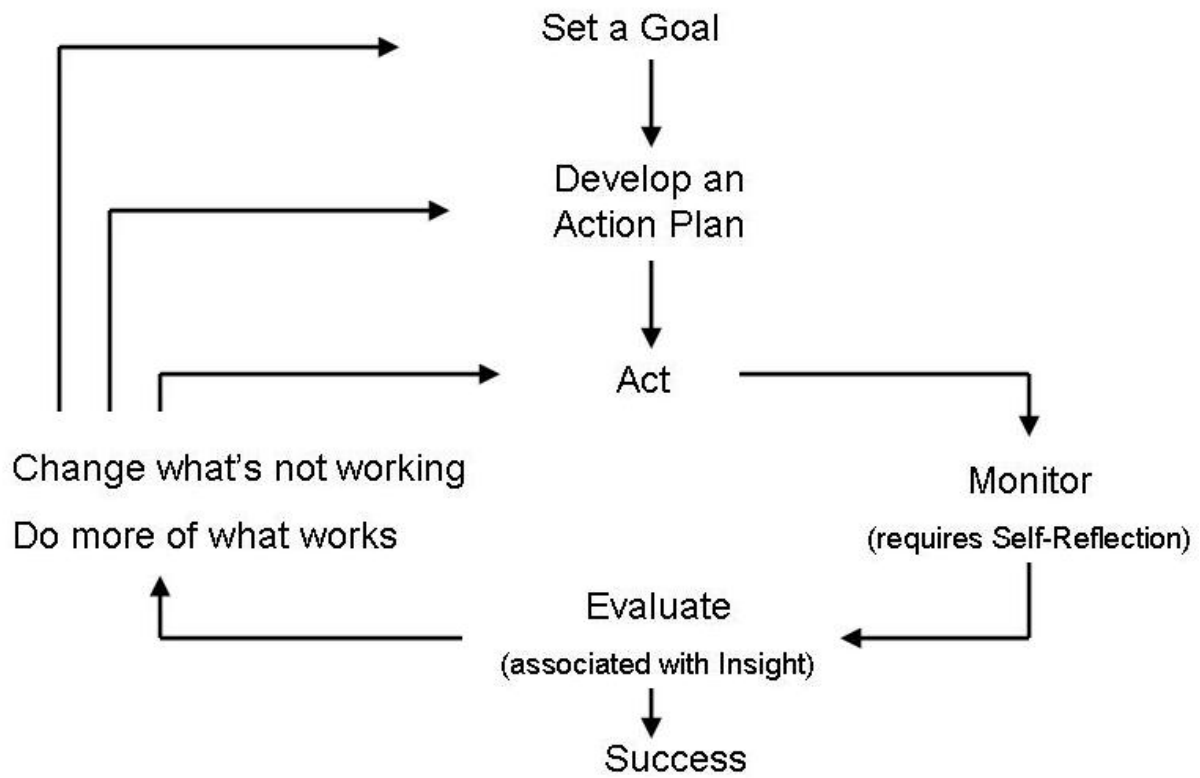


Figure 2. Generic model of self-regulation and goal attainment (Grant, 2003)

Method 1: Calculating Goal Attainment change scores *without* difficulty ratings

	A	B	C
	Time 1 Success Score	Time 2 Success Score	Difference score (B – A)
Participant 1	50%	75%	25
Participant 2	50%	75%	25

Conclusion:
The difference score, also known as the goal attainment change score, indicates that participants were equally successful at attaining their goals over time.

Method 2: Calculating Goal Attainment change scores *with* difficulty ratings

	A	B	C	D	E	F	G
	Time 1 Success Score	Time 1 Difficulty Score	Time 1 Goal Attainment Score (A X B)	Time 2 Success Score	Time 2 Difficult Score	Time 2 Goal Attainment Score (D X E)	Difference Score (F – C)
Participant 1	50%	1	50	75%	1	75	25
Participant 2	50%	4	200	75%	4	300	100

Conclusion:
The difference score, also known as the goal attainment change score, indicates that Participant 2 was more successful in attaining their goal over time than Participant 1.

Figure 3. An example illustrating the advantage of calculating goal attainment change scores with difficulty ratings.

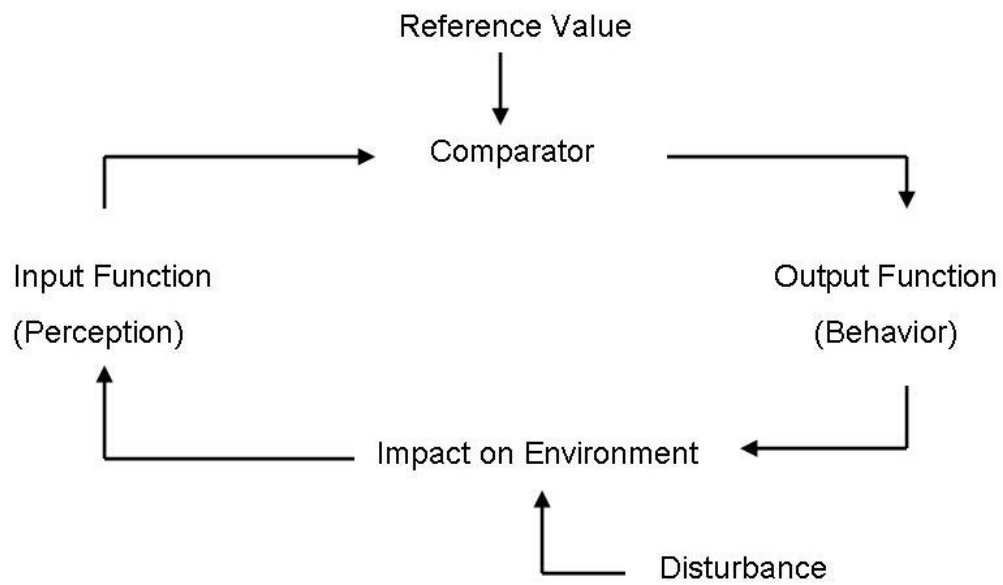


Figure 4. The negative feedback loop: a basic unit of control theory (Carver & Scheier, 1981)

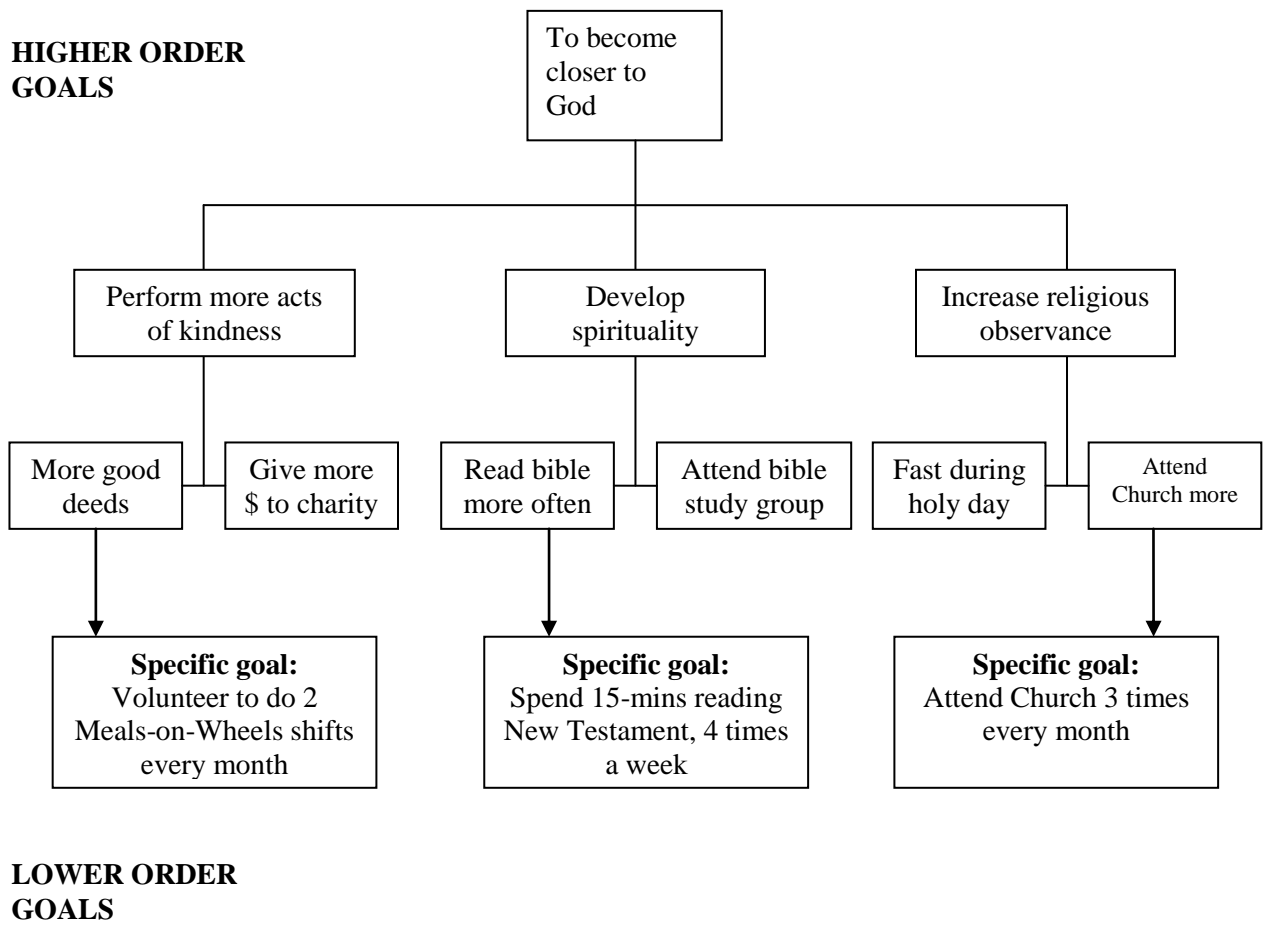


Figure 5. A hierarchy of goals (adapted from Spence, 2008),

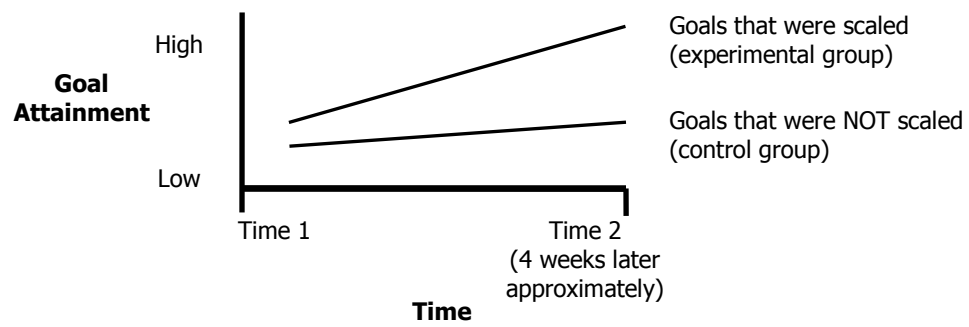


Figure 6. Hypothesized impact of GAS on goal attainment over time in current study.

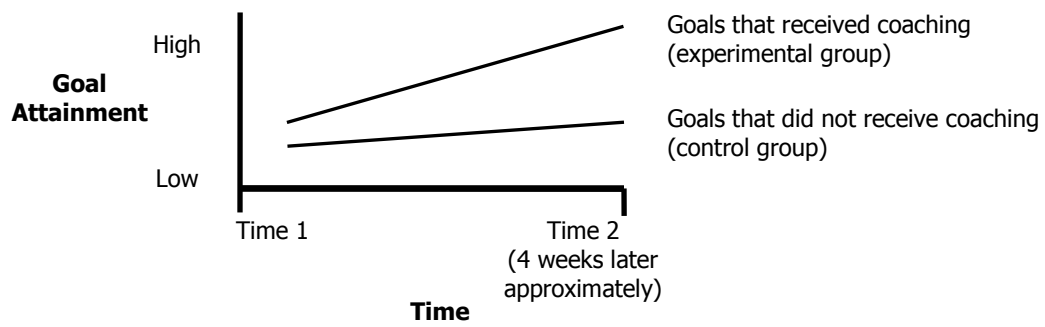


Figure 7. Hypothesized impact of coaching on goal attainment over time in current study.

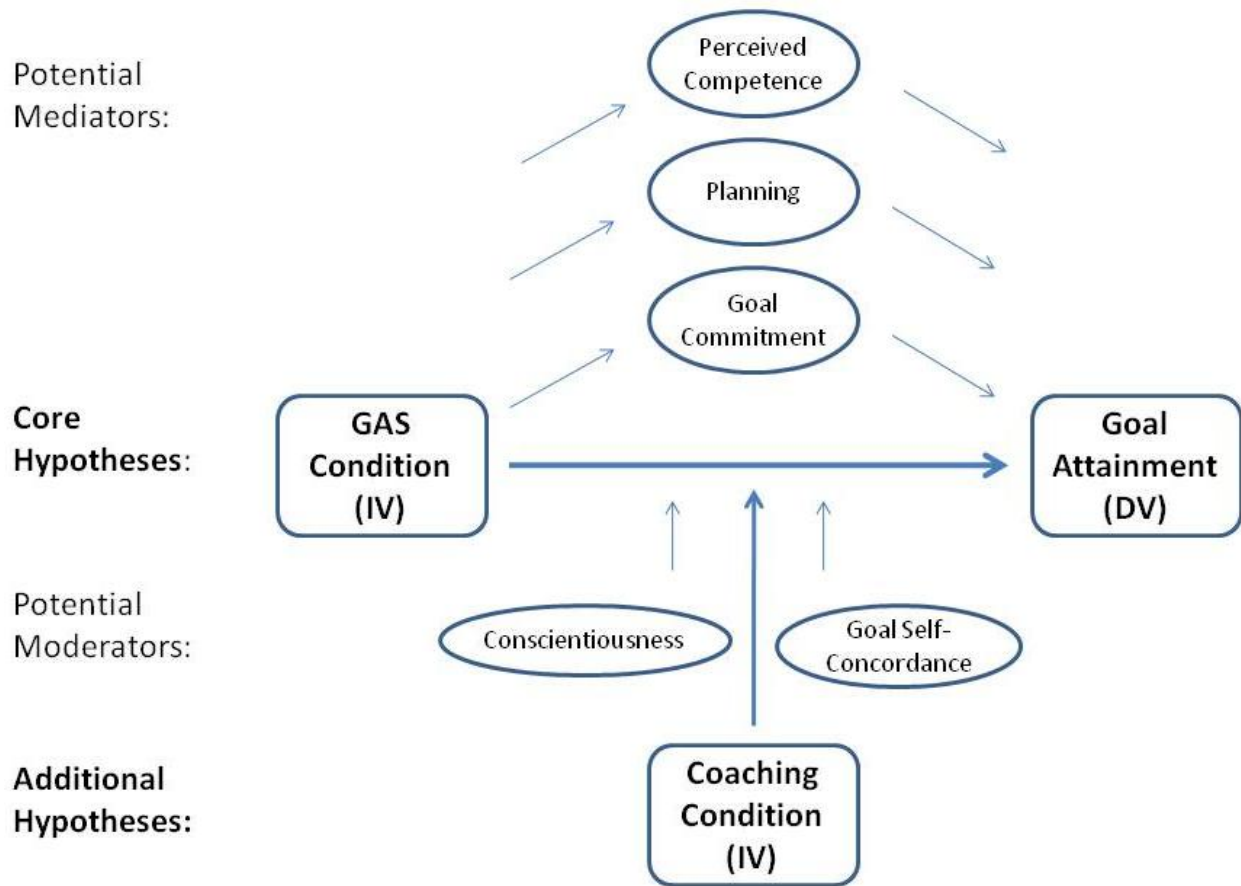


Figure 8. Examining GAS’s impact on goal attainment in a coaching versus non-coaching context: modeling potential mediators and moderators.

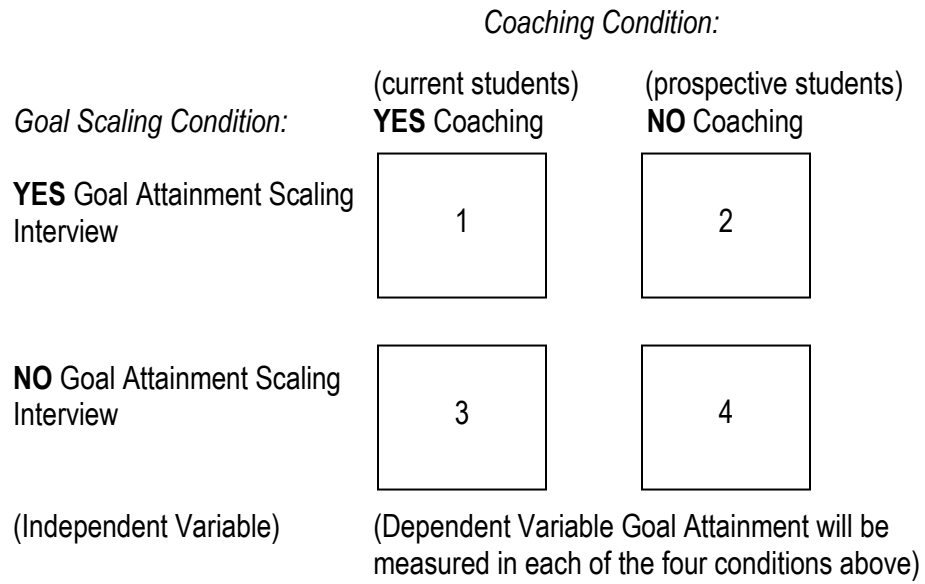


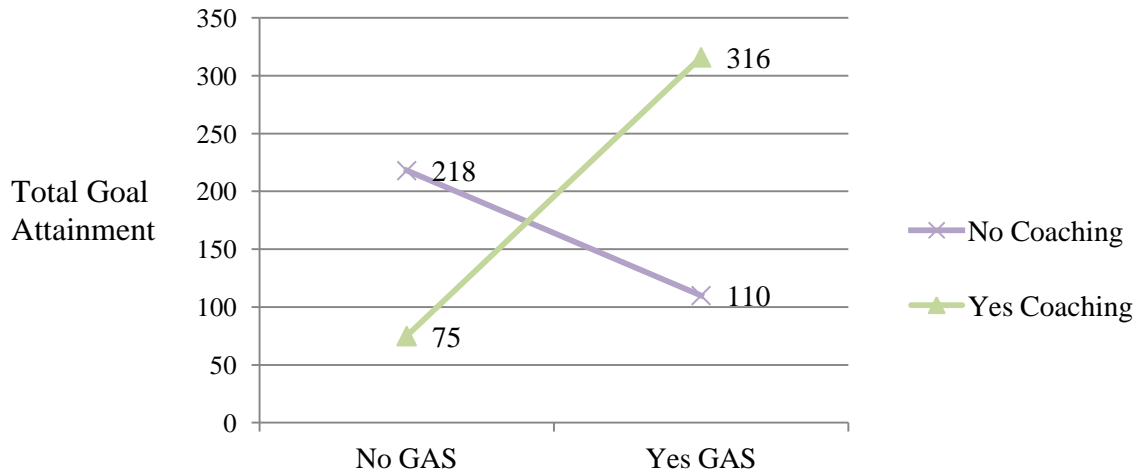
Figure 9. Current study's 2 X 2 between-subjects research design

Higher order goal	Your Goal
	To continue learning and exploring my spirituality
Lower order goal	Have numerous one-on-one conversations about fundamental questions with people;
Scaled Levels	
Best expected outcome	6 conversations
More than expected outcome	5 conversations
Expected outcome	3-4 conversations
Less than expected outcome	2 conversations
Worst expected	0-1 conversations

Higher order goal	Your Goal
	Become a visionary leader
Lower order goal	Demonstrate strategic behaviors in my weekly meetings with my three direct reports including asking more questions, discussing books/articles, and sharing knowledge (information from higher up in the organization, resources, etc.)
Scaled Levels	
Best expected outcome	Demonstrated strategic behaviors a total of 11 or 12 times over the course of the month
More than expected outcome	8, 9, or 10 times
Expected outcome	6 or 7 times
Less than expected outcome	3, 4, or 5
Worst expected	0, 1, or 2 times

Figure 10. Example Goal Attainment Scaling chart for personal goal (top) and career goal (bottom)

Low Conscientiousness Participants



High Conscientiousness Participants

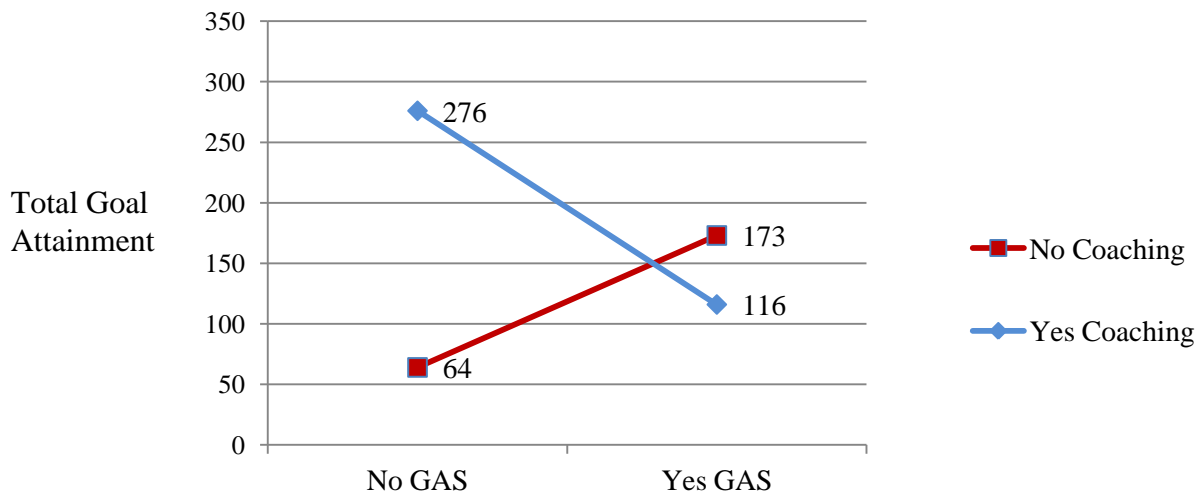


Figure 11. Plots demonstrating the 3-way interactive effect of GAS, Coaching, and Conscientiousness on Total Goal Attainment. Mean Conscientiousness was 5.5 with a standard deviation of 0.8. The interactions above approached significance, $p = .058$.

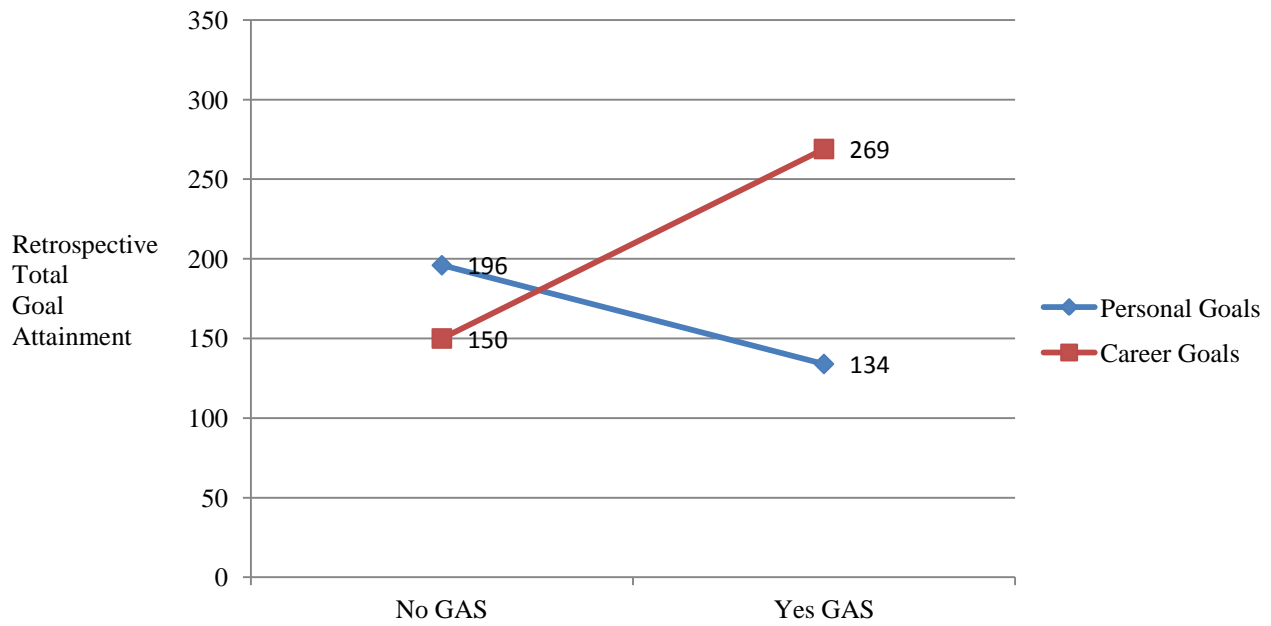
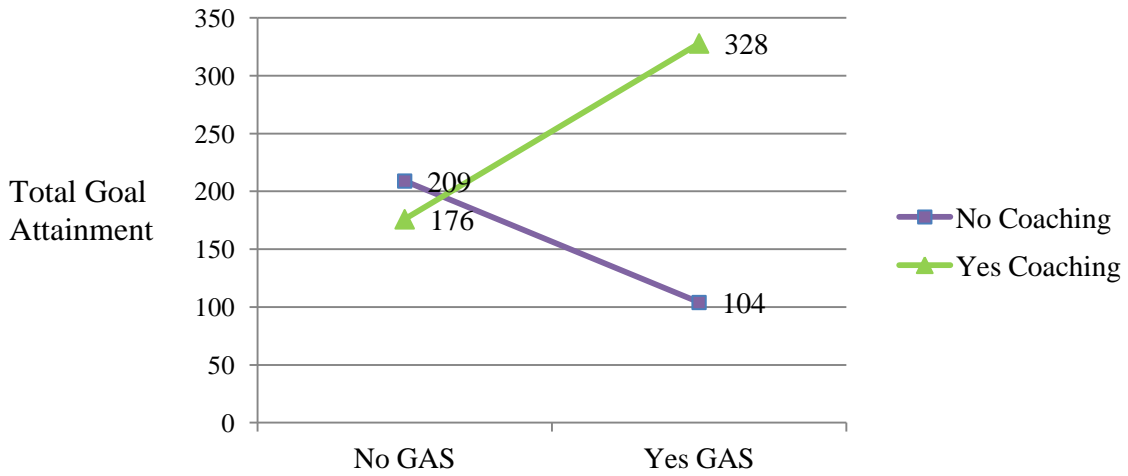


Figure 12. The 2-way plot of GAS and Goal Type on Retrospective Total Goal Attainment. The interaction between GAS and Goal Type was significant at the $p < 0.05$.

Participants choosing Low Order goals:



Participants choosing High Order goals:

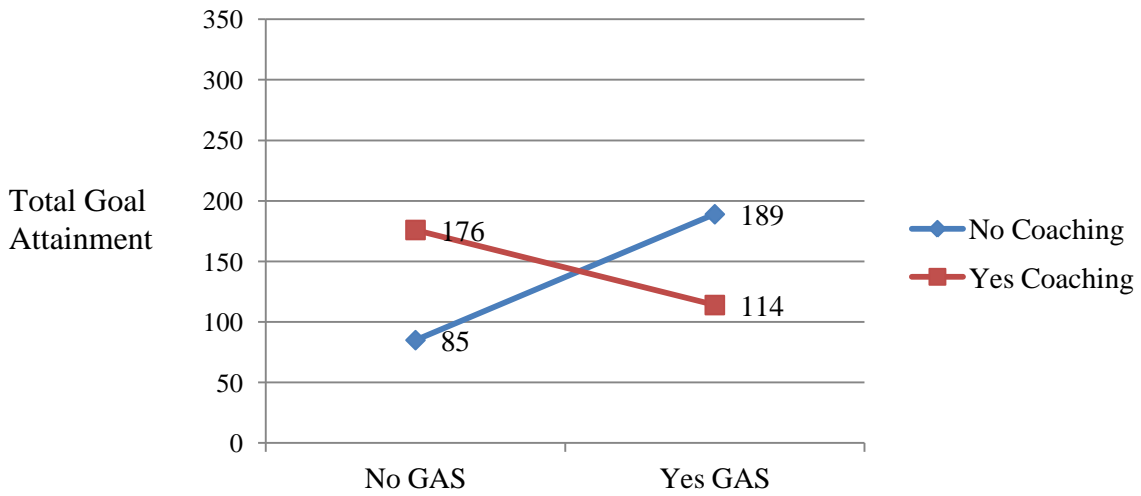


Figure 13. Plots demonstrating the 3-way interactive effect of GAS, Coaching, and Order on Total Goal Attainment.

Appendix 1: Recruitment flier for potential research participants (current and prospective students)

Coaching Research

Participate in an empirical study on coaching outcomes led by a goal-setting expert

Why participate?

1. **Set a goal, analyze your motivations, and measure your success.**
2. **Contribute to the science of coaching.**

Did you know that despite an estimated **15,000** coaches practicing worldwide, and **\$1-2 billion dollars** spent on coaching annually, only **12** published empirical studies of coaching fit minimal standards of academic rigor?

What is required?

Two telephone interviews with a goal-specialist to discuss a goal you are interested in pursuing.



Yaron Prywes
Columbia University
PhD Candidate

For more information email:
yp2002@columbia.edu

This researcher has been certified in basic human subjects protection and this study has been approved by the Institutional Review Board of Teacher's College, Columbia University.

**INSTITUTIONAL
REVIEW BOARD**

TEACHERS COLLEGE  **COLUMBIA UNIVERSITY**
IN THE CITY OF NEW YORK

Appendix 2: Informed consent and participant rights for research participants

INFORMED CONSENT
Current and Prospective Students

DESCRIPTION OF RESEARCH: You are invited to participate in a research study that examines factors that support people's attainment of goals during coaching. Since goals play such a large role in coaching, further our scholarly understanding of goal attainment would be an important advancement to the field.

Participating in this study involves having two phone interviews with a researcher who specializes in goal-setting. Participants will (1) pick a goal they are motivated to pursue and are interested in implementing; (2) answer questions related to the pursuit of this goal, and (3) measure their success in attaining their goal. The first phone call will take between 30 to 60 minutes and the second phone call will take approximately 15 minutes. The second phone call will take place approximately four weeks after the first.

You are free to discuss these phone interviews and the goal you set with your coach if you wish; it is entirely up to you. The researcher will not share with your coach anything from the phone interviews and can not be involved with coaching conversations.

RISKS AND BENEFITS: This research has the same amount of risk students typically encounter during a usual classroom activity or goal-setting activity. There is some risk that by participating in the exercise you could be associated with the results of the study.

To minimize this risk, the following procedures are put into place:

- (1) All data collected during the interview will not be shared with anyone without identifying information first being deleted and names being changed (i.e., pseudonyms).
- (2) Only the researcher will have access to the individual level data.
- (3) Reporting of results will be done at the group level, which means your individual name and goal attainment will not be reported.
- (4) Phone interviews will not be recorded and all phone conversations will be made from a private location.

You may refuse participation or withdraw your participation at any time without jeopardy to your student status or other entitlements.

Participating in this research *may* result in increased understanding of your goal and your motivation to pursue it.

The results of this study will be used for my dissertation. Promising results may be used in the future to be published in journals, articles, or used for educational purposes.

Sincerely,

Yaron Prywes

PARTICIPANTS RIGHTS
Current and Prospective Students

Principal investigator: Yaron Prywes

I have read and discussed with the researcher the Research Description in the INFORMED CONSENT document. I have had the opportunity to ask questions about the purposes and procedures regarding this study.

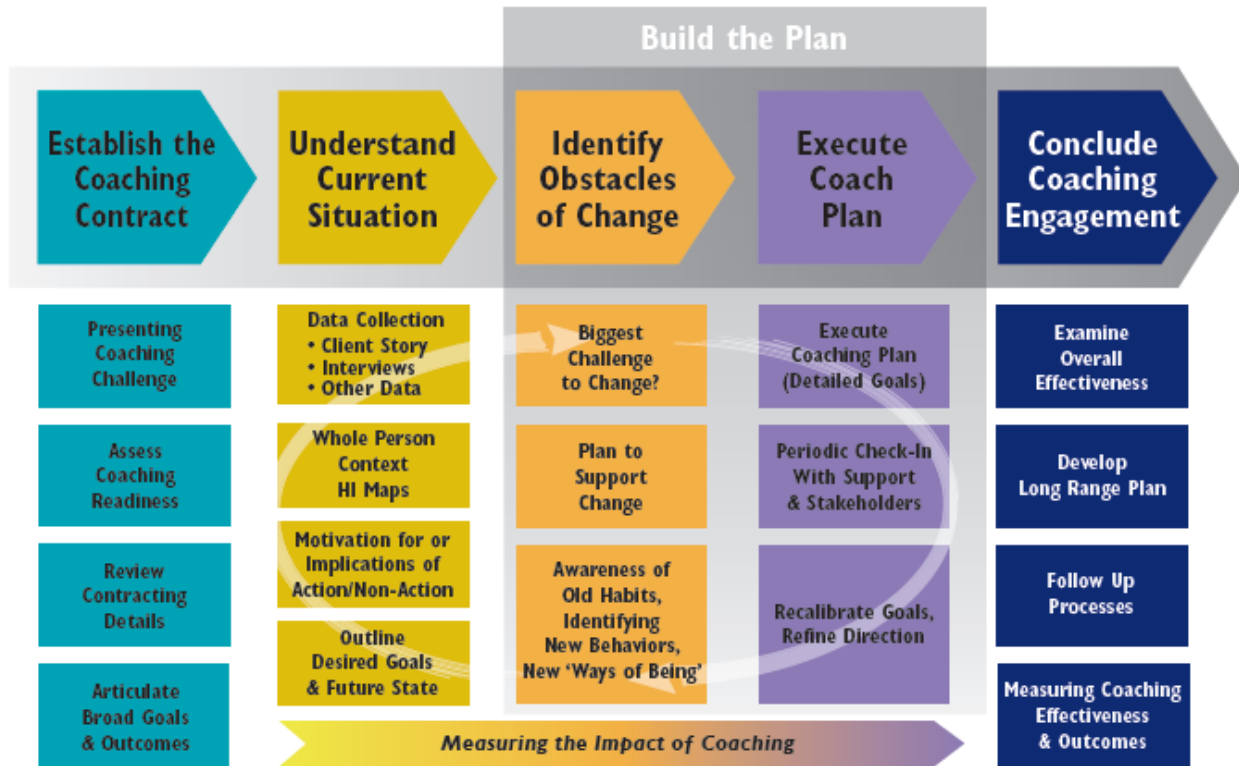
- My participation is voluntary. I may refuse to participate or withdraw from the participation at any time without jeopardy to future employment, student status or other entitlements.
- The researcher may withdraw me from the research at his professional discretion.
- If, during the course of the study, significant new information becomes available which may relate to my willingness to continue to participate, the investigator will provide this information to me.
- If at any time I have questions regarding the research or my participation, I can contact the investigator, who will answer my questions. The investigator's phone number is **201-218-7673**.
- If at any time I have comments, or concerns regarding the conduct of the research or questions about my rights as a research subject, I should contact the Teachers College, Columbia University Institutional Review Board (IRB). The phone number for the IRB is 212-678-4105. Or, I can write to the IRB at Teachers College, Columbia University, 525 W. 120th Street, New York, NY, 10027, Box 151.
- I should receive a copy of the Research Description and this Participant's Rights document via e-mail.
- No video or audio taping is part of this research.
- My consent to participate will be asked orally by the researcher over the telephone. An affirmative response indicates my agreement to participate in this study.

Participant's Name: _____

Date participant gave affirmative consent to participate in this study: __/__/__

Appendix 3: Coaching process utilized by Hudson Institute coaches

Hudson Coaching Process



Your Coaching Process Checklist

ESTABLISHING THE COACHING CONTRACT

- Are you clear about the Presenting Coaching Issue?
- Have you assessed Coaching Readiness? Does individual understand what to expect from coaching, is individual interested in making some changes? Is individual ready to take on this work at this time?
- Review of Contracting Details: Does individual understand the relevant details including time commitment, pricing, location, potential interviews, assessments, and any necessary 3-way conversations with boss/HR partner, etc?
- Early articulation of Broad Goals and Outcomes

UNDERSTANDING CURRENT SITUATION

- Have you collected relevant data: client story, interviews with stakeholders, meeting with boss, assessment data, etc?
- Have you taken a whole person, developmental perspective: using HI Maps are your guide, locating client on Cycle of Renewal (for your information, not for the client)
- After understanding current situation, have you examined carefully with client implications of no-action vs. taking action through coaching in order to thoroughly uncover motivation?
- With all of this information compiled, have you now carefully outlined desired goals that will move the client toward the desired future state they have articulated?

IDENTIFY OBSTACLES TO CHANGE

- What are your client's biggest obstacles in reaching this goal (desired state), what's going to make it tough to attain?
- Have you developed with your client, a step-by-step plan that will support this change?
- Have you worked with client to become aware of habits that support old situation and new behaviors that will support the articulated goals and desired situation?

EXECUTE COACH PLAN

- Iterative process of executing coaching plan (tied to shared, detailed goals)
- Where appropriate, period check-in with support people and stakeholders (boss, etc)
- Recalibrate the Goals, Refine Direction: throughout is important to update when appropriate

CONCLUDE COACHING ENGAGEMENT

- Step back and examine overall effectiveness – how did this work for client, were goals achieved?
- Work with client to develop long-range plan going forward
- Design follow up processes including potential calls in the future
- Measure Outcomes and Impact: How did meeting these goals impact client, boss, co-workers, team, organization, bottom line? Where critical, engage in some ROI measures that provide detailed feedback to the system.

Appendix 4: Measures

List of proposed measures and items for this study's dependent variable, potential mediating variables, and potential moderating variables

Goal attainment change score

Each participant is asked the following two questions regarding their individual goal at Time 1 and Time 2:

1. "To this point, how successful have you been in attaining this goal? (From 0% successful to 100% successful)."
2. "How difficult is this goal? (1 = *very easy* to 5 = *very difficult*)."

Time 1 and Time 2 goal attainment are calculated by multiplying the answer to each of the above questions. The goal attainment change score is calculated by subtracting Time 2 goal attainment from Time 1 goal attainment.

Perceived competence ($\alpha = .72$; Adapted from Williams & Deci, 1996)

1. I feel confident in my ability to attain my goal.
2. I am capable of attaining my goal.
3. I am able to achieve the goal I identified.
4. I feel able to meet the challenge of attaining my goal.

Planning ($\alpha = .74$; created for this study by researcher)

1. I've thought a lot about how to accomplish my goal.
2. I've visualized the steps I will take to accomplish my goal.
3. I've identified specific behaviors that will help me achieve my goal.
4. I've anticipated barriers that may interfere my attaining my goal.

Goal commitment ($\alpha = .72$, T2 $\alpha = .78$; Klein et al., 2001)

1. It's hard to take this goal seriously. (R)
2. Quite frankly, I don't care if I achieve this goal or not. (R)
3. I am strongly committed to pursuing this goal.
4. It wouldn't take much to make me abandon this goal. (R)
5. I think this is a good goal to shoot for.

Goal Self Concordance ($\alpha = .52$, adapted Sheldon & Houser-Marko 2001).

1. You strive for this goal because somebody else wants you to or because the situation seems to compel it. (R)
2. You strive for this goal because you would feel ashamed, guilty, or anxious if you didn't. (R)
3. You strive for this goal because you really believe it's an important goal to have.
4. You strive this goal because of the enjoyment or stimulation which that goal provides you.

Conscientiousness ($\alpha = .84$; IPIP, 2009)

1. Am always prepared.
2. Pay attention to details.
3. Get chores done right away.
4. Carry out my plans.
5. Make plans and stick to them.
6. Waste my time. (R)
7. Find it difficult to get down to work. (R)
8. Do just enough work to get by. (R)
9. Don't see things through. (R)
10. Shirk my duties. (R)

Note. Items followed by an "R" indicate that the item is to be reverse scored before analysis. All items utilized Likert-type agreement anchors ranging from 1 = *Strongly Disagree* to 4 = *Neutral*, and finally to 7 = *Strongly Agree*.

List of measures and items for this study's control, manipulation check, and supplementary variables.

Goal stability^{1 2 3} ($\alpha = .77$)

1. My understanding of this goal did not change significantly since the first telephone interview.
2. My reasons for pursuing this goal have remained steady over the past four weeks.
3. My interest in this goal did not change significantly over the past four weeks.

Goal opportunity^{1 3}

1. I had the opportunity to pursue my goal over the past four weeks or so.

Demographic variables¹

Please indicate:

1. The year you were born.
2. Your gender
3. Your Race/Ethnicity: African American or Black; Latino or Hispanic; Caucasian or White; Asian American or Asian (including Chinese; Filipino; Indian; Japanese; Korean); Other
4. Employment status (Full-time, Part-time, Unemployed)

Coaching sessions^{1 4}

1. How many coaching sessions have you experienced since the first telephone interview?

Coach experience^{1 4}

1. Is your coach new (practice for 0 – 3 yrs), experienced (3 – 7 yrs), or a seasoned (8 or more yrs)?
2. Was your coach certified by the Hudson Institute?

Note. Variables and questions followed by a '1' were created for this study by researcher. Variables followed by a '2' indicate a scale. Variables followed by a '3' are questions utilizing Likert-type agreement anchors ranging from 1 = *Strongly Disagree* to 4 = *Neutral*, and finally to 7 = *Strongly Agree*. Variables followed by a '4' are questions administered only to Coaching condition participants.