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# Predicting Goal Progress and Burnout Using Goal Hierarchies

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PREDICTING GOAL PROGRESS AND BURNOUT

USING GOAL HIERARCHIES


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ABSTRACT

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The current study examined the relationships between aspects of goal hierarchies (i.e., goal importance, goal progress, goal relatedness, goal number, goal achievement) and specifically their effects on the important outcomes of goal progress and burnout. Although goal pursuit is an important area of study in psychology, aspects of goal hierarchies are understudied, especially in relation to perceived progress and outcomes of wellbeing. The current research provided evidence that goal progress is negatively related to burnout, that the relatedness between goals of the same hierarchical level and across levels influences our perceptions of the importance of these goals, and that explicit and implicit goal hierarchies give overlapping but unique results and allow for the examination of different aspects of an individual's goal hierarchy. Further, the study suggests that goal progress might be a possible mechanism through which resilience influences burnout and subjective well-being.

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Goal setting is a prominent area of study in the psychological literature that has strong implications for how individuals perform on assigned or self-selected tasks (e.g., Locke & Latham, 1990). For example, researchers find that difficult, specific goals produce higher task performance across a variety of situations if individuals are committed to these goals (e.g., Locke, Latham, & Erez, 1988). As well, the pursuit and attainment of these goals has consequences for personal wellbeing (e.g., Klug & Maier, 2015) and for burnout (e.g., Vasalampi, Salmelo-Alo, & Nurmi, 2009). Researchers have posited that goals exist in a hierarchy in which lower order goals accomplish higher order goals (e.g., Campion & Lord, 1982; Carver & Scheier, 1998; Powers, 1973). However, whereas early goal setting research has focused on single goal environments such that individuals only have one active goal upon which to focus, researchers have explored more recently the idea that people exist in multiple goal environments and focus on more than one goal in their daily lives (e.g., DeShon & Gillespie, 2005), whether these goals are work-related or personal. However, it remains relatively unexamined how the relatedness of these multiple, focused goals to one another as well as to important, higher order goals affects performance, personal wellbeing, and burnout. It might be that the pursuit of multiple goals that are more closely aligned with each other and with importance higher order goals might produce more motivation to attain these goals, deplete fewer resources, and increase overall performance during this multiple goal pursuit compared to the pursuit of goals that are less closely related. In the current study, I examine how goal-related variables such as perceived goal importance and the relatedness between mid-level goals and one another as well as the relatedness between

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mid-level goals and higher level goals influences important outcomes, specifically goal progress and burnout.

## Goals

Goals are defined as internal representations of desired end-states and are often considered the central focus of motivation (Austin & Vancouver, 1996). Indeed, goals are central to many theories of motivation (e.g., Bandura, 1977; Deci & Ryan, 1985; Lewin, Dembo, Festinger, Sears, & Hunt, 1944; Locke & Latham, 1968; Powers, 1973) and serve to direct human behavior. Many researchers have argued that the discrepancy between a person's current state and his or her desired end-state is the driving motivator of action (e.g., Carver & Scheier, 1998; Locke & Latham, 1990), whether this discrepancy occurs on a higher, more abstract level (e.g., needs) or a lower, more concrete level (Austin & Vancouver, 1996). Indeed, even the act of creating a goal creates a discrepancy that must be reduced (Bandura & Locke, 2003). Thus, individuals desire to reduce this discrepancy either through action (Carver & Scheier, 1998) or through the readjustment of goals (e.g., Austin & Vancouver, 1996).

### Goal Setting

Whereas researchers operating under a control systems model of motivation (e.g., Campion & Lord, 1982; Powers, 1973) have argued that the reduction of a discrepancy between a goal and a person's current performance motivates a person to act, Locke and Latham (1990) posited in goal-setting theory that goals themselves are immediate regulators of human action. Indeed, Locke and Latham stated that goals have inherent characteristics that should be considered in the study of motivation. Namely, they identified two broad categories of goal content and goal intensity.

Goal content refers to the specific characteristics of the outcome a person is pursuing (Locke & Latham, 1990; 2013). The two most studied aspects of goal content are goal level and goal specificity. Goal level, or goal difficulty, is how difficult the goal is to achieve. This is a separate concept from task difficulty, as goals of differing difficulties could be set for the same task, such as getting a B or getting an A in a class. Goal specificity is the extent to which a goal is more clear or ambiguous in what is required to complete it. Research has found that difficult, specific goals lead to higher performance (e.g., Latham & Yukl, 1975; Locke, 1968). However, this relationship between goal content and performance relies upon a person being committed to a goal.

Goal intensity refers to the commitment a person has toward a goal as well as the importance of that goal. Locke and Latham (1990; 2013) posited that goals regulate the intensity of effort an individual puts into a task and that this affects an individual's intensity in attaining and motivation to attain a goal. Whereas importance of the goal plays into a person's commitment to that goal, goal commitment is required for a goal to regulate a person's effort and performance. For example, research has found that goal difficulty enhanced performance only to the point at which a person is no longer committed to a goal (Locke, Latham, & Erez, 1988 ). Further, in both the consideration of goals arranged hierarchically and in consideration of people being in environments in which they must focus on more than a single goal at a time, goal intensity and goal importance in particular might be an important factor of study in determining how people prioritize and allocate their effort when presented with multiple goals.

**Goal Hierarchy**

In order to discuss how people choose and pursue goals in a multiple goal environment, it is important first to understand the hierarchical nature of goals. When addressing the issue of how goals relate to one another and to what extent goals provide information for other goals, researchers believe that goals are arranged in a hierarchy (e.g., Campion & Lord, 1982; Carver & Scheier, 1998; DeShon & Gillespie, 2005). Indeed, much of modern goal research operates under the implicit assumption that goals are hierarchically arranged such that lower level goals help to accomplish higher level goals. Powers (1973) was an early proponent of this idea and posited that the self-regulation of behavior consisted of a hierarchical organization of feedback loops. These feedback loops consisted of similar components, such as inputs, outputs, comparators, and reference values or targets. Because the reference values in feedback loops can be interpreted as goals, this led to an early hierarchical model of goals and their involvement in behavior and action within the psychological literature. However, Powers's focus was more on the lower, more neurological levels of abstraction, and his work was concerned more with feedback loops that allowed for such things as basic movement and motor skills. Current goal research has focused more on higher levels of abstraction, such as goals of achievement or performance (e.g., DeShon & Gillespie, 2005), rather than at the neurological level (e.g., Powers, 1973).

A hierarchy of goals exists in such a way that there are both higher level or higher order goals and lower level or lower order goals. Also, it is important to note that the location of a goal in a goal hierarchy is a distinct concept from what Locke and Latham (1990) describe as goal level, which addresses the issue of the difficulty of the goal. In a goal hierarchy, higher order goals are superordinate to those below them, and those lower

order goals are subordinate to the goals located on a higher level or order of the goal hierarchy. From early conceptions of hierarchical self-regulation models, researchers have imagined superordinate goals as providing information to the subordinate goals below them (e.g., Carver & Scheier, 1998). Subordinate goals tend have shorter time frames than superordinate goals and are more quickly obtained (Lord & Levy, 1994). Further, the attainment of subordinate goals is thought to help accomplish their respective superordinate goals. Indeed, interviews with managers about their goals and how the goals relate to one another supported this notion (Bateman, O'Neill, & Kenworthy-U'Ren, 2002). Thus, a hierarchical structure of goals can be thought of as having higher order goals that provide information to and explain the purpose of lower order, subordinate goals which further the attainment of higher order goals.

Lower order goals are necessary in accomplishing higher order goals. Also, lower order goals are more concrete, and higher order goals are more abstract. For example, whereas an individual might have a high level goal of "being responsible," there are lower order goals involving accomplishing concrete actions such as "completing tasks on time" or "admitting to mistakes" that serve to accomplish the individual's goal of responsibility. These lower level goals in a hierarchy might have goals subordinate to them, which would involve a specific task that needs to be accomplished, such as completing one particular task.

Although one person will not necessarily have the same goals as the next, researchers often classify different broad, encompassing areas within the goal hierarchy. Powers (1973) and Carver and Scheier (1998) classified very abstract, top level goals that represent principles such as "honesty" or "be" goals, which draw from a person's idea of

his or her ideal self. They considered more middle level goals to be programs or "do" goals. Carver and Scheier classified bottom-level goals, those that are most concrete, as sequences or motor control goals. Other researchers have developed similar conceptualizations of the levels of a goal hierarchy. For example, DeShon and Gillespie (2005 identified four common levels of a goal hierarchy. At the top level reside self goals (e.g., agency, esteem), then principle goals (e.g., growth, fairness), achievement goals (e.g., mastery-approach, performance-avoid), and finally action plan goals (e.g., seek feedback, manage impressions). Regardless of the classification of the levels, researchers have generally agreed that goals within a hierarchy have some degree of relation to one another, and that the attainment of lower level goals serves to further higher level goals.

**Personality and Goal Importance**

Although researchers have differed in their labels of the different levels of a goal hierarchy, the top level is commonly thought of as being composed of self goals, or goals that revolve around an individual's idealized self (e.g., Carver & Scheier, 1998; DeShon & Gillespie, 2005). Because these goals represent qualities or characteristics that are more fundamental to an individual's sense of self, these higher level goals are often more important to an individual than lower level goals simply due to their vertical location in the goal hierarchy. Further, Carver and Scheier (1998) proposed several ways in which goals, given similar positions in a goal hierarchy, might be more or less important than other goals. First, a goal might contribute more to the completion of a higher order goal than another goal of the same level. For example, if personal achievement is a highly important goal for an individual, completing a challenging work assignment would be

more important than dusting the shelves, as it better accomplishes the superordinate goal of personal achievement.  Second, a goal might be more important than another goal of the same level if it serves to accomplish more than one important higher order goal.  For example, if a person has higher order goals of both personal achievement and financial stability, completing a challenging work assignment could help accomplish both of those goals whereas building a ship in a bottle might only contribute toward the superordinate goal of personal achievement.

Further, two factors not explicitly mentioned might contribute to a lower order goal being more important than other lower order goals.  First, the importance of the higher order goal should influence the importance of subordinate goals that contribute toward its achievement.  Just as lower order goals can vary in importance within the same hierarchical level, higher order goals also likely vary in their importance.  For example, a person might have both the higher order goals of "kindness" and "achievement," but they consider being kind much more important to their sense of self.  If presented with two possible actions that would fit the idea of being kind or the idea of personal accomplishment, a person would likely prioritize the action or lower order goal that is aligned with the more important higher order goal, or kindness, in this situation.  Second, the alignment of multiple, lower order goals with a single higher order goal might affect a person's evaluation of the importance of those aligned goals.  That is, in an environment wherein people must accomplish or strive to achieve more than a single goal at a time, it might be that a group of subordinate goals aligned with the same superordinate goals would be considered more important as a whole than an assortment of goals aligned with

varying superordinate goals due to the interrelatedness of the goals that contribute toward the same superordinate goal.

Although people can assess and self-report the importance of their higher order goals, it might be that personality also influences the importance of certain higher order goals. Barrick, Mount, and Li (2013) posited that higher order goals are closely associated with personality factors, and that these personality traits initiate purposeful goal strivings. They stated that these personal strivings interact with other motivational forces, such as those related to job characteristics, and that this produces higher experienced meaningfulness, motivating individuals to attain desired outcomes. Barrick, Mount, and Li stated that our higher order goals organize our dispositional tendencies to express a given personality trait in a way that is distinct from other traits or higher order goals. Thus, although people might possess similar higher order goals to one another, the importance assigned to those goals will differ from person to person as indicated by different personalities. Further, this implies that when we assess an individual's personality, we might also be assessing the importance of the higher order goals associated with those personality traits.

**Multiple Goal Environments**

Although goal researchers recognize that goals are hierarchically arranged and that high-level goal can influence lower level goals, much of the goal research until recently has focused on single goal environments (e.g., Locke & Latham, 1990). However, more recent research has acknowledged the importance of studying goals within the context of multiple goal environments (e.g., DeShon & Gillespie, 2005; Louro, Pieters, & Zeelenberg, 2007; Schmidt & DeShon, 2007). The study of single goals in

isolation does not capture the entire work experience of an employee (Ashford &
Northcraft, 2003; Kernan & Lord, 1990; Mitchell, Harman, Lee, & Lee, 2008; Schmidt &
DeShon, 2007). Indeed, the hierarchical structure of goals itself implies that single goals
do not exist within a vacuum of only themselves (Powers, 1973). This acknowledgment
is important because people are constantly operating within a multiple goal context,
whether they are at work or at home. Firstly, it is important to recognize the multiple
goal context in which people exist because people also have personal goals and concerns
in addition to those assigned to them at work. Although people at work might be capable
of putting their maximum effort into a task that needs to be completed, they might
conserve energy based on the difficulty or ease of the task so that they might go the gym
after work, attend a parent-teacher conference, or meet with an old acquaintance.
Depending on the importance of the different goals people are focusing on, they will
allocate their effort differently. Secondly, in modern work contexts, workers are often
responsible for the accomplishment of various tasks at any given time. Whether workers
have multiple projects that must be completed or whether they have multiple duties to
which they must attend, workers must often make choices about how they allocate their
time and energy amongst work tasks and to which actions they must give priority.

**Goal Pursuit in a Multiple Goal Environment**

When pursuing a goal, people must choose a goal and strive toward its attainment.
Goal striving is the process of trying to attain a certain goal (Lewin et al., 1944). Goal
striving involves individuals exerting effort over a period of time to reach the goal
(Kanfer, 1990), regularly comparing their performance to the goal to make appropriate
adjustments (Bandura, 1997; Carver & Scheier, 1998), or comparing their rate of

progress to a desired rate (Carver & Scheier, 2008). Thus, in the process of pursuing a desired goal, individuals must regularly evaluate their progress to determine whether they should adjust performance, adjust the goal, or disengage and switch to other goals. Indeed, in a multiple goal environment, individuals must choose a single goal upon which to focus at any given time. Often, people focus on mid-level goals but can focus on higher levels goals if cued (DeShon & Gillespie, 2005; Vallacher & Wegner, 1987). The chosen goal focused on is called an "action goal," which Klein defines as the goal a person is pursuing at a given time toward which effort is being direction (Klein, Austin, & Cooper, 2008). Also, Klein identified important distinctions between action goals and selected goals (i.e., goals chosen and pursued at a later time), goal sets (i.e., the possible goals to pursue within one domain), and goal hierarchy (entire goal structure). Whereas individuals might have multiple selected goals from a possible goal set, only one goal, the action goal, is the focus of attention at any point in time.

When presented with multiple selected goals, a variety of factors influence which goals individuals prioritize in pursuing as the action goal as well as where the individuals allocate their effort and time. One major factor is the discrepancy between a person's goal and that person's current performance, or the goal-performance discrepancy (GPD; Kernan & Lord, 1990). Whereas the negative goal-feedback discrepancy is a central theme in control theory (e.g., Campion & Lord, 1982), similarly is the goal-performance discrepancy a large predictor of which goals individuals will choose to prioritize. When people have goals of varying discrepancies, they prioritize goals with the largest goal-performance discrepancy (Kernan & Lord, 1990). Further, they allocate more resources (e.g., time, effort) to the larger GPD goals compared to the smaller GPD goals. However,

the relationship between GPD and goal prioritization and resource allocation is complex. Whereas people tend to prioritize and spend time completing goals with higher GPD, this relationship reverses when a goal nears its deadline, for example (Schmidt & DeShon, 2007). When a deadline looms, people must evaluate which goals can be completed within this timeframe, and they prioritize goals that are closer to completion rather than goals that are further from attainment.

Further, other factors moderate the relationship between goal-performance discrepancy and goal prioritization. Incentives for goals influence how predictive GPD is for resource allocation (Schmidt & DeShon, 2007). When some goals in a multiple goal environment are incentivized and other goals are not, people tend to consider the mainly the GPD of the incentivized goals to decide which goal to pursue as the active goal and how much time to allocate toward it. Further, valence and expectancy both interact with the magnitude of a goal-performance discrepancy to determine goal prioritization in a multiple goal environment (Kernan & Lord, 1990).

Concerning goal pursuit and resource allocation, psychological and physical resources are limited within a multiple goal context, and people must allocate appropriately resources to any action goal in the consideration of other goals. Aside from choosing which goal in a multiple goal situation to pursue first, individuals must choose how much effort to allocate toward that goal and for how long to pursue it. Much of the recent goal research has highlighted this notion, taking into account that people might choose to preserve effort and time in one situation and spend it in another. For example, Vancouver (Vancouver, More, & Yoder, 2008) found self-efficacy was negatively related to resource allocation. Whereas this relationship might seem counterintuitive framed in

the context of a single goal environment, it is understandable when considering a multiple goal context. Because resources are limited, people will naturally allocate resources appropriate to what they expect is necessary to attain a goal and save excess resources for other goals.

Also, this idea is apparent in the study of affect in multiple goal environments. For example, research has found that positive affect associated with a goal that has a large goal-performance discrepancy often leads to a subsequent increase in effort toward that goal, whereas positive affect associated with a low GPD goal can lead to a person decreasing effort and refocusing on other goals (Louro, Pieters, & Zeelenberg, 2007). Further, people use information such as performance feedback to direct resource allocation appropriately. For example, when individuals in a team environment are given feedback focused on individual-level performance, team-level performance, or both, the individuals allot their resources according to the nature of the feedback (DeShon, Kozlowski, Schmidt, Milner, & Wiechmann, 2004). The limited nature of resources becomes apparent in that feedback focused on both individual-level performance and team-level performance results in lower individual- or team-level performance compared to when feedback focused on the individual or team level alone is given.

An important consideration in the study of goals is that whereas people are constantly presented with multiple potential goals to pursue and to spend their effort and time, people must also take into account that their resources are limited. This is an idea that researchers have often overlooked in studies that perceive in single-goal environments. Research on goals must account for this idea, and this idea highlights the importance of studying goals in a multiple goal context. Further, having multiple,

potentially important goals to pursue has important implications for individuals in terms

of goal pursuit.  For example, should too many important goals require the individual's

attention, the individual's progress on these goals may suffer.  Even if the individual

intends to expend more effort toward his or her important goals, he or she might not have

the resource capacity to do so.  In the long term, this could lead to important and negative

consequences, such as burnout.

**Burnout**

Burnout is a state of exhaustion often attributed to one's job or career, since the

1970s (Freudenberger, 1974; Maslach, 1976).  Freudenberger, the first to coin the term

"burnout," defined it as "a state of mental and physical exhaustion caused by one's

professional life" (Freudenberger, 1974).  Although researchers have varied in their exact

definitions of burnout, several popular theories exist.  One of the most common

definitions of burnout comes from Maslach's multidimensional theory of burnout

(Maslach, 1982; 1998), which defines burnout as having three major, distinct dimensions

or characteristics.

Maslach (1982; 1998) identified burnout as being composed of exhaustion,

depersonalization, and reduced personal accomplishment.  Exhaustion is considered the

central quality of burnout and is one of the most reported and studied aspects of burnout

(Maslach, Schaufeli, & Leiter, 2001).  Exhaustion is an experienced state and is seen also

as promoting the act of depersonalization.  Depersonalization is the second major

dimension of burnout and involves people actively placing distance between themselves

and characteristics of their job in order to preserve psychological resources and to

diminish the emotional demands of a job.  The third dimension of burnout is inefficacy,

or a decreased sense of personal accomplishment. This reduced sense of personal accomplishment can be a result of exhaustion and depersonalization (e.g., Lee & Ashforth, 1996), or it might develop in parallel with the other two dimensions (e.g., Leiter, 1993).

Although the Maslach multidimensional theory of burnout is the dominant theory used in psychological literature, a criticism of Maslach's conceptualization of burnout is that it only occurs among workers who do "people work" (Maslach, 1982; Maslach & Jackson, 1986). Other, current research has attempted to expand the study of burnout to a broader, more general population of workers. For example, Kristensen, Borritz, Villadsen, and Christensen (2005) developed a definition of a unidimensional burnout that applies to a more general population. This general conceptualization of burnout has three sub-dimensions, including a general personal burnout, and more specific sub-dimensions of work-related burnout and client-related burnout. Whereas personal burnout is a more general degree of physical and psychological exhaustion experienced by a person, work- and client-related burnout are specific in a person's perception of work or clients being the root cause of the exhaustion. In another line of research, Demerouti created a general burnout inventory to capture burnout in non-social worker populations, the Oldenburg Burnout Inventory (OLBI; Demerouti, Bakker, Vardakou, & Kantas, 2003).

**Personal and Environmental Factors Related to Burnout**

As to when burnout occurs, research has focused mostly on environmental characteristics such as those specific to the job. However, recent research has examined also individual characteristics related to burnout such as different aspects of personality

(e.g., Alarcon, Eschelman, & Bowling, 2009). A meta-analysis by Alarcon et al. (2009) showed that Maslach's three dimensions of burnout, emotional exhaustion, depersonalization, and reduced personal accomplishment, were negatively related to a variety of personality factors such as self-esteem, internal locus of control, conscientiousness, emotional stability, positive affectivity, and others. Further, burnout was positively related to negative personality factors such as negative affectivity. Relating to medical practitioners in particular, researchers have found elements of the Maslach Burnout Inventory (MBI) to be related to personal characteristics such as pessimism, perfectionism, a lack of coping skills, and poor relationships with colleagues (Eckleberry-Hunt, Lick, Boura, Hunt, Balsubramaniam, Mulhem, & Fisher, 2009).

In terms of external characteristics related to burnout, one of the more well-studied subjects is the relationship of burnout to characteristics and demands of the job. Researchers have used a variety of models and theories examining job characteristics and demands to study burnout and employee satisfaction or dissatisfaction. Much of the current research in job characteristics and burnout stems from earlier models such as two-factor theory (Herzberg, 1966), a model of employee satisfaction which stated that there are dissatisfiers or 'hygiene factors' (e.g., company policies, supervision, salary, working conditions) which cause workers to feel unsatisfied if factors are not present. As well, there are satisfiers or motivator factors (e.g., achievement, recognition, advancement), and these satisfiers make workers feel good about their work if they are present. Other influential models include the job characteristics model (Hackman & Oldman, 1980), which stated that there are responses to the job (e.g., job satisfaction, absenteeism, turnover) that are a function of the job characteristics (e.g., skill variety, task significance,

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autonomy, and are moderated by personal characteristics, and the demand-control model (Karasek, 1979), which stated that strain in a job is the result of the combination of high job demands and low job control whereas high job demands and high job control lead to positive outcomes such as learning and personal growth.

Currently, one of the more dominant models examining external factors leading to burnout is the job demands-resources (JD-R) model (Demerouti, Bakker, Nachreiner, & Schaufeli, 2001). Originally, the JD-R model was conceived to study burnout outside of the context of social workers. The JD-R model assumed that there are too main qualities of burnout: Exhaustion and disengagement. Further, the model stated that whereas job demands and resources can vary from job to job, job demands are the primary predictor of both physical and psychological exhaustion and that the lack of job resources is the primary predictor of disengagement. JD-R defined job demands as any physical, psychological, social, or organizational aspect of the job that requires psychological or physical effort and thus has a psychological or physical cost (Bakker & Demerouti, 2014). Thus, high work pressure or emotionally demanding interactions would be examples of job demands. These demands only become a problem when a worker cannot call forth the required resources for job demands. Job resources, then, are the physical, psychological, social, or organizational aspects of the job that help to achieve work goals, reduce job demands and their costs, and promote learning, growth, and development. JD-R theory posited that job demands and job resources actually trigger two separate, independent processes. Job demands predict outcomes involving exhaustion, and job resources, or the lack thereof, predict motivational and work engagement outcomes

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(Bakker, Demerouti, & Verbeke, 2004). Both job demands and job resources, then, influence job performance, and interact in their effects on one another.

As characterized by the JD-R model, researchers have considered burnout as a state of exhaustion and depersonalization (Bakker & Demerouti, 2014), similar to Maslach's conceptualization. However, burnout's relationship with job demands and job resources is cyclical in that burnout can place additional job demands on employees (Demerouti, Bakker, & Bulters, 2004) and can cause employees to view their work environments and job demands more negatively. Further, disengagement as a result of being burned out can be detrimental in that work engagement causes workers to mobilize better their job resources, or even create additional resources (Hobfoll, 2002).

**Burnout in the Medical Field**

Although a problem for a wide variety of occupations, burnout in particular is a prominent concern in the medical field for physicians and for students (Dyrbye, West, Satele, Boonoe, Tan, Sloan, & Shanafelt, 2014). Compared to non-medical school college graduates, medical students reported higher levels of emotional exhaustion, depersonalization, and burnout in general. Further, medical students reported a higher presence of depression symptoms and fatigue levels. Physicians, particularly those with fewer than five years of practice, reported higher levels of burnout, as well.

Further, burnout in medical populations is related to a number of negative outcomes, including both outcomes affecting the physician or student as well as his or her patients. On the patient side, medical students who reported being more burned out also reported more unprofessional behaviors relative to patient care compared to students who reported less burnout, and these students held fewer altruistic views (Dyrbye, Massie,

Eacker, et al., 2010).  In another study, surgeons who reported higher levels of burnout more frequently reported major medical errors which they attributed to internal individual rather than external factors (Shanafelt, Balch, Bechamps, et al., 2010).  On the personal side, research has associated burnout in physicians with increased symptoms of depression, lower quality of life (West, Shanafelt, & Kolars, 2011), thoughts of turnover (Dyrbye, Thomas, Power, et al., 2010), and suicidal ideations (Dyrbye, Thomas, Massie, et al., 2008).  This research has identified burnout not only as an issue related to performance but also to the health of those in a burned out state and their patients.

Current research on burnout in the medical field has focused on interventions to help physicians recover from burnout and on identifying practices of those who are more resilient to burnout.  For example, research has shown that mindfulness interventions seem to reduce or decrease burnout symptoms of emotional exhaustion, depersonalization, and reduced personal accomplishment both in the short term and in the long term (Krasner, Epstein, Beckman, Suchman, Chapman, Mooney, & Quill, 2009).  In terms of positive actions that promote recovery from burnout or resilience to burnout, research has demonstrated that actions intended to restore or generate resources are negatively related to burnout (Eckleberry-Hunt et al., 2009; Zwack & Schweitzer, 2013).  Examples of these actions would be leisure-time activity, cultivating positive relationships with colleagues or family, and schedule control.  Indeed, burnout and burnout interventions are consistent topics of research in the medical literature.

## Multiple Goal Alignment and Goal Relatedness

Outcomes such as job performance and work-related burnout are important outcomes in both medical literature and psychological literature.  Although research has

linked aspects of goals and goal setting to performance (e.g., Locke, Latham, & Erez, 1988) and well-being (Sheldon & Elliot, 1999), less research has studied how the structure of goal hierarchies relates to an individual's performance, motivation, and level of burnout. More specifically, it remains unstudied how the relatedness of mid-level goals, both to other mid-level goals within a goal set and to higher order goals, affects outcomes, e.g., goal progress or burnout. The goal of the current research is to investigate this issue.

Whereas people implicitly hold higher order goals and assign importance to these goals, the relatedness of multiple, mid-level goals to one another and to a higher order goal is likely to affect both performance (i.e., progress toward goals) and burnout for several reasons. First, it is likely that people who pursue goals that are more related to a higher order goal and more closely related to other mid-level goals will be more efficient in their use of limited resources (e.g., effort, time) compared to people who pursue less closely-related goals. From research on multiple goal environments, researchers understand that people have limited resources, and when presented with multiple goals, people must decide how to allocate appropriately those limited resources (e.g., DeShon et al., 2004). At a basic level, I expect people to pursue and progress more in those goals, both mid-level and high-level, that are most important to them.

**Hypothesis 1a:** Goal importance of mid-level goals is positively related to mid-level goal progress.

**Hypothesis 1b:** Goal importance of high-level goals is positively related to high-level goal progress.

Further, in terms of mid-level goal importance, I expect that the importance of mid-level goals is a factor of the extent to which that mid-level goal accomplishes a higher order goal as well as that higher order goal's importance to the individual. Additionally, I expect that the size of the set of mid-level goals has an influence on the average importance of that mid-level goal set. Whereas a large set of mid-level goals offers multiple opportunities in which an individual might accomplish a higher order goal, a smaller set of mid-level goals presents only a few options. Thus, it is likely that mid-level goals that are alone or few in accomplishing an important higher order goal would be more important to a person than mid-level goals that are one of many within a large goal set.

**Hypothesis 2a:** Goal importance of mid-level goals is positively related to the importance of the higher order goals under which the mid-level goals are aligned.

**Hypothesis 2b:** Goal importance of mid-level goals is positively related to the extent to which the mid-level goal serves to accomplish the respective higher order goal.

**Hypothesis 3a:** The number of mid-level goals within a goal set is negatively related to the average mid-level goal importance of that goal set.

**Hypothesis 3b:** The number of mid-level goals within a goal set is positively related to the variance in mid-level goal importance of that goal set.

Although I believe that people in general will pursue and progress in goals that are important to them, research shows that when people are given multiple goals that are not easily attained together and are in conflict, those people perceive the demands as exceeding their capabilities and might choose to abandon or reduce effort on one goal in order to achieve another (Schmidt & Dolis, 2009). People who pursue a set of multiple,

mid-level goals that are more closely related to one another should perceive less conflict between their current, mid-level goals and should evaluate these goals as more attainable. People in this scenario should perceive themselves as more capable of allocating resources to those multiple goals. Thus, by having both more resources available to commit as well as the motivation to put forth those resources in goal pursuit, people should perform better in pursuing more closely related, mid-level goals.

However, there is another plausible outcome when a person pursues a set of closely related, mid-level goals. Although it is possible pursuing a specific goal might lead to a spillover of progress on other closely related goals, a person might not evaluate it as necessary to allocate resources toward goals that are similar to his or her current goal. That is, presented with multiple goals that are closely related, a person is likely to see these goals as having similar importance in accomplishing a relevant higher order goal. Thus, that person might select one of those closely related mid-level goals and allocate resources to those goals, knowing that it is sufficient in accomplishing his or her higher order goal. Whereas progress on one or two mid-level goals might be greater, a set of closely related, mid-level goals might see low goal progress on average. Because of these two similarly plausible scenarios involving the relatedness of goals and average goal progress within a set of goals, the next hypothesis is exploratory in nature and will be presented as a research question.

**Research Question 1**: Is the average relatedness of mid-level goals within a set of goals positively or negatively related to average goal progress within that set of goals?

Regardless of whether the average goal progress within that goal set is higher or lower, a person with a set of closely related mid-level goals should achieve greater higher

order goal progress with respect to the higher order goal that encompasses that set of mid-level goals.

**Hypothesis 4:** The relatedness of mid-level goals within a set of goals is positively related to higher order goal progress.

In terms of burnout, researchers understand from JD-R theory that high job demands and low available job-related and personal resources can lead to physical and emotional exhaustion as well as depersonalization (e.g., Bakker & Demerouti, 2014). Given the limited nature of personal resources, goals that are not related to one another create conflict and can cause individuals to perceive themselves incapable of meeting the high demands of these conflicting goals (Schmidt & Dolis, 2009). People who perceive their mid-level goals as being more closely related to one another should use fewer personal resources in pursuing these goals than if the goals are less closely related. As a result of a diminished depletion of resources, these individuals should exhibit fewer symptoms of burnout.

**Hypothesis 5**: Goal relatedness within mid-level goal sets is negatively related to symptoms of burnout.

Although I predicted that people will be more motivated, make more progress, and be less burned out while pursuing multiple goals aligned under a single or set of closely-related higher order goals, it is important to take into account the importance of these higher order goals in this regard. Not all higher order goals will have equal importance, and the importance of these higher order goals will differ from person to person. Whereas one individual might value a higher order goal of becoming wealthier, another might value more a goal of becoming kinder, a third might value both goals as

equally, highly important, and a fourth might consider both goals equally unimportant. If

one person has multiple goals that are aligned under a higher order goal of being a kind

person yet does not consider this to be an important, higher order goal, then that person

would be less motivated to pursue those goals and might prioritize other, unrelated goals.

Thus, it is likely that the importance of higher order goals moderates the effect of goal

relatedness on burnout

**Hypothesis 6**: The importance of high-level goals moderates the relationship

between mid-level goal relatedness and burnout such that the relationship is more

strongly negative at higher levels of high-level goal importance.

As previously discussed, people have limited resources to attribute to the pursuit

of their goals and in such a scenario must choose toward which goal they allocate their

resources (Schmidt & Dolis, 2009). Then, what needs to be taken into consideration is

how the lack of progress toward an important goal influences an individual's level of

burnout. Indeed, past research has found that goal progress often leads to higher reports

of well-being (e.g., Koestner, Lekes, Powers, & Chicoine, 2002), but conflicting research

finds no such relationship in other situations (e.g., Judge, Bono, Erez, & Locke, 2005). It

is possible that the importance of the goal moderates this relationship. If a goal is

unimportant, goal attainment or goal progress might have little effect on a person's

satisfaction. Yet, if the goal is important, progress toward that goal is likely to lead

toward higher ratings of satisfaction and well-being. Similarly, it is likely that a lack of

progress toward a highly important goal would lead to lower feelings of satisfaction. In

the long term, this constant exhaustion and frustration at the lack of progress toward an

important goal might lead to burnout.  Thus, we expect goal progress to be negatively related to burnout when the goal in question is important.

**Hypothesis 7:**  Goal progress is more strongly and negatively related to burnout at higher levels of goal importance.

Finally, as the current study relies to an extent on individual's perceptions of the relations between their goals and their goal hierarchies in general, it is of interest how goal hierarchies that are explicitly defined and identified relate to implicitly identified goal hierarchies.  Thus, two research questions in the current study examine the extent to which explicitly identified goal hierarchies match or mismatch implicitly identified goal hierarchies and what influence a possible match or mismatch of goal hierarchies might have on outcomes such as burnout.

**Research Question 2:**  To what extent do individuals' implicit goal hierarchies relate to their explicitly identified goal hierarchies?

**Research Question 3:**  To what extent does a mismatch between implicit and explicit goal hierarchies influence levels of burnout?

## Method

**Participants**

**Focus group.**  Participants for the focus group were 11 third-year medical school students from a midwestern university.  The medical school provided a list of 12 randomly selected third-year medical school students to participate in the focus group, and 11 attended the focus group session.  Participants had an average age of 25.67 years, were 72.7% female (8 female, 3 male), and were 36.4% white and 27.3% black.

**Main study.** Participants were medical school students beginning their third year. There were 110 third-year medical school students in the class, and all were asked to participate. Of those students, 77 participated in the study. However, 11 participants provided unusable data due to incomplete data or inattentive responding. Thus, data from 66 participants was used in the analyses of the main study. The 66 participants had an average age of 25.24 years, were 54.5% female (36 female, 30 male), and were 60.6% white and 15.15% black. Further, the 11 participants from the focus group were allowed to participate in the main study, and all provided usable data. Additionally, the 11 focus group participants were identified as having participated in the focus group through the use of a "yes or no" question at the end of the survey.

**Procedure**

**Focus group.** I conducted a focus group composed of medical school students to identify a list of approximately 10 mid-level goals common to most medical school students. Focus group participants were first instructed to compose their own lists of goals, including both school related and non-school related goals. Subsequently, focus group participants discussed their goal lists to refine the list to approximately 10 goals.

**Main study.** First, I administered a resilience measure. Then, I presented all participants with the list constructed by the focus group of common mid-level goals related to medical school and non-medical school activities. First, participants rated the importance of each goal. Then, students made paired comparison judgments between each possible pair of goals, indicating the extent to which each goal was related to the other goal in the pair. After this, I presented the participants with the list of mid-level goals and asked them the extent to which they believed they were progressing toward

attaining each goal. Next, I explained the concept of higher order goals to the participants (goals that are more abstract and long term) and asked participants to identify two to four higher order goals. Similar to the mid-level goals, participants assessed importance of and progress toward each of the identified high-level goals. Then, participants rated for each mid-level goal the extent to which that lower order goal related to or was important for accomplishing each identified higher order goal that the student identified. Finally, I asked participants whether they would like to identify any additional mid-level goals that were not in the given list of mid-level goals and rate for any additional identified goals the extent to which these additional goals related to or were important for accomplishing the previously identified higher order goals. This was optional. Finally, participants completed a survey including measures of burnout, well-being, and demographics.

**Measures**

      **Goal importance and progress.** Goal importance and goal progress were assessed for the list of 11 mid-level goals that were developed from the focus group (see Appendices A and B) as well as the two to four high-level goals identified by participants in the main study (see Appendices C, D, and E). I assessed the extent to which each goal was important to the participant (i.e., goal importance) using a single item per goal, see Appendices A and D. I assessed the extent to which each participant was progressing toward the completion of each goal (i.e., goal progress) using a single item per goal, see Appendices B and E. Using a single item to assess goal aspects such as importance and progress is consistent with other literatures, e.g., the assessment of goal valence in Expectancy Theory (Vroom, 1964) or assessing goal importance and progress of personal

projects in the counseling psychology literature (Little, 1983).  Participants responded

using a response scale ranging from 1 (*not at all*) to 5 (*to a great extent*) for each of the

identified goals.Higher responses on the measures indicated greater goal importance and

greater progress toward a goal, respectively.

**Goal relatedness.**  I first assessed goal relatedness between dyads of mid-level

goals using paired comparisons between each of the 11 specific goals, resulting in 55

total comparisons, see Appendix F.  Participants rated how closely related each goal pair

was using a response scale ranging from 1 (*not at all*) to 5 (*to a great extent*).  Higher

responses on the paired comparisons indicated more closely related goals.  Then, I used

hierarchical agglomerative clustering analysis to cluster goals together based on these

paired comparisons.  From the paired comparison data, I created a dissimilarity matrix for

each participant.  Then, using this dissimilarity matrix, I calculated a Euclidian distance

between each item and the other items.  I used Euclidian distance as it is not only one of

the more common measures of distance used for this technique but also because

Euclidean distance has the benefit of being able to be interpreted as the physical distance

between two points in Euclidean space.  At this point in the clustering process, the two

closest items (mid-level goals, in this case), were clustered together.  Then, the next two

closest items (mid-level goals and clusters) were clustered together.  This process

repeated until each participant had three clusters of mid-level goals.

Next, I calculated a goal relatedness score within a goal cluster as the average

Euclidian distance from the specific goals in a cluster to the center of that cluster.  Goal

relatedness was assessed for each goal cluster.  Thus, higher goal relatedness scores

indicated further distance on average from the goals within a cluster to the center of the

27

cluster. Higher calculated goal relatedness scores indicated a greater distance and less relatedness between a goal and the center of its cluster.

**Goal accomplishment.** I assessed goal accomplishment using the list of 11 mid-level goals developed in the pilot study as well as 2 to 4 higher level goals identified by each participant, see Appendix G. For each goal, participants rated on a scale of 1 (*not at all*) to 5 (*to a great extent*) the extent to which each mid-level goal was important in accomplishing each specified higher-level goal. Higher responses indicated the mid-level goal as serving to accomplish the specified higher-level goal to a greater extent.

**Burnout.** I assessed burnout using the Copenhagen Burnout Inventory, a 13-item scale measuring both personal and work-related burnout (Kristensen, Borritz, Villadsen, & Christensen, 2005, see Appendix H). The Copenhagen Burnout Inventory is composed of a 6-item subscale that measures personal burnout and a 7-item subscale that measures work-related burnout. Participants responded to the first 10 items using a scale ranging from 1 (*never/almost never*) to 5 (*always*), and the last three items using a scale ranging from 1 (*to a very low degree*) to 5 (*to a very high degree*). Reverse coded items were negatively keyed, and responses were averaged to obtain an average personal and an average work-related burnout score. Higher scores indicated higher levels of burnout. Kristensen et al. (2005) found the personal burnout subscale to have an internal consistency of $\alpha = .87$ and the work-related burnout scale to have an internal consistency of $\alpha = .87$. Whereas much of the burnout literature focuses on the Maslach Burnout Inventory, past research has found the Copenhagen Burnout Inventory to have similar psychometric properties and to be able to identify high burnout individuals as well as the Maslash Burnout Inventory (e.g., Winwood & Winefield, 2004). For the current study,

internal consistency was $\alpha = .92$ for work-related burnout and $\alpha = .82$ for personal burnout.

**Additional Measures**

I assessed two additional measures not related to the main hypotheses of the study: Resilience and subjective well-being. The main purpose of assessing resilience and subjective well-being was to assess more fully in additional analyses the relationships between goal variables and burnout.

**Resilience.** I assessed dispositional resilience (i.e., how well an individual copes with stress) using a 25-item scale (Connor & Davidson, 2003, see Appendix I). Participants responded using a scale ranging from 1 (*not true at all*) to 5 (*true nearly all of the time*). Responses on the scale were averaged. Higher scores indicated a greater resilience to stress. Connor and Davidson (2003) found the scale to have a test-retest reliability of .87 and an internal consistency of $\alpha = .89$. The internal consistency of resilience for the current study was $\alpha = .92$.

**Subjective well-being.** I assessed subjective well-being using the Satisfaction with Life Scale (SWLS; Diener, Emmons, Larsen, & Griffin, 1985), which measures life satisfaction, see Appendix J. The scale is composed of 5 items with responses ranging from 1 (*strongly disagree*) to 7 (*strongly agree*). Responses were averaged to obtain an average life satisfaction score with higher scores indicating greater life satisfaction. A meta-analysis by Vassar (2008) found the SWLS to have an internal consistency reliability of $\alpha = .78$. The internal consistency reliability of the subjective well-being measure for the current study was $\alpha = .92$.

**Demographics.**  I assessed demographic information using a 4-item measure.

The measure assessed age, gender, desired medical profession, and race, see Appendix K.

## Results

**Focus Group**

Participants in the focus group identified a list of 11 mid-level goals that they

believed to be common to most 3rd year medical school students, such as "Performing

well on board exams" or "Learning patient interaction."  See Table 1 for a full list of mid-

level goals identified by the focus group as well as average importance and progress

ratings for each goal.

Table 1

*List of Mid-level Goals and Importance and Progress Ratings*

|  | Goal Importance | | Goal Progress | |
|---|---|---|---|---|
|  | *M* | *SD* | *M* | *SD* |
| 1. Performing well on board exams. | 4.67 | 0.54 | 3.86 | 0.91 |
| 2. Learning patient interaction. | 4.62 | 0.63 | 4.06 | 0.89 |
| 3. Exercising regularly. | 3.76 | 1.02 | 2.91 | 1.19 |
| 4. Sleeping regularly. | 3.86 | 0.99 | 2.97 | 1.10 |
| 5. Publishing research. | 2.83 | 1.36 | 2.50 | 1.22 |
| 6. Hanging out with friends regularly. | 3.44 | 0.98 | 2.80 | 1.04 |
| 7. Attending important family events. | 3.77 | 1.08 | 2.90 | 1.12 |
| 8. Managing a budget. | 3.42 | 1.02 | 2.89 | 1.07 |
| 9. Getting a good residency. | 4.53 | 0.64 | 3.53 | 1.07 |
| 10. Performing well on rounds and courses. | 4.62 | 0.52 | 3.71 | 1.02 |
| 11. Taking a day to relax each week. | 3.23 | 1.27 | 2.85 | 1.22 |

## Descriptive Statistics

For means and standard deviations of goal importance and goal progress ratings, see Table 1. For correlations between goal importance ratings of individual mid-level goals, see Table 2. For correlations between goal progress ratings of individual mid-level goals, see Table 3. For correlations between goal importance and goal progress ratings of

individual mid-level goals, see Table 4.  For means, standard deviations, and correlations

between person-level variables, see Table 5.  For means, standard deviations, and

correlations between aggregated variables (i.e., aggregated mid-level goal importance and

progress, aggregated cluster importance and progress, aggregated mid-level goal

relatedness, and aggregated high-level goal importance and progress) see Table 6.  For

correlations between aggregated variables and person-level variables, see Table 7.

Table 2

*Correlations between Goal Importance Ratings of Mid-level Goals*

| Goals | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Performing well on board exams. | | | | | | | | | | |
| 2. Learning patient interaction. | -0.06 | | | | | | | | | |
| 3. Exercising regularly. | 0.02 | 0.26* | | | | | | | | |
| 4. Sleeping regularly. | 0.09 | 0.39** | 0.33** | | | | | | | |
| 5. Publishing research. | 0.36** | -0.08 | 0.22 | -0.11 | | | | | | |
| 6. Hanging out with friends regularly. | -0.16 | 0.07 | 0.17 | 0.36** | -0.22 | | | | | |
| 7. Attending important family events. | -0.05 | 0.28* | 0.23 | 0.37** | 0.05 | 0.55*** | | | | |
| 8. Managing a budget. | 0.07 | 0.16 | 0.20 | 0.19 | 0.13 | 0.30* | 0.41** | | | |
| 9. Getting a good residency. | 0.39 | 0.05 | -0.01 | 0.07 | 0.42*** | -0.03 | 0.20 | 0.38** | | |
| 10. Performing well on rounds and courses. | 0.20 | 0.36** | 0.35** | 0.11 | 0.17 | 0.09 | 0.28* | 0.22 | 0.24 | |
| 11. Taking a day to relax each week. | -0.32** | 0.22 | 0.09 | 0.33** | -0.28* | 0.62 | 0.33** | 0.30* | -0.15 | 0.02 |

*Note.*
* indicates significance at the .05 level.
** indicates significance at the .01 level.
*** indicates significance at the .001 level.

Table 3

*Correlations between Goal Progress Ratings of Mid-level Goals*

| Goals | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Performing well on board exams. | | | | | | | | | | |
| 2. Learning patient interaction. | 0.50*** | | | | | | | | | |
| 3. Exercising regularly. | 0.34** | 0.14 | | | | | | | | |
| 4. Sleeping regularly. | 0.26* | 0.33** | 0.45*** | | | | | | | |
| 5. Publishing research. | 0.38** | 0.17 | 0.29* | 0.13 | | | | | | |
| 6. Hanging out with friends regularly. | 0.23 | 0.06 | 0.02 | 0.33** | -0.14 | | | | | |
| 7. Attending important family events. | 0.34** | 0.13 | 0.04 | 0.27* | 0.06 | 0.62 | | | | |
| 8. Managing a budget. | 0.32** | 0.20 | 0.11 | 0.08 | 0.18 | 0.31** | 0.35** | | | |
| 9. Getting a good residency. | 0.58*** | 0.26* | 0.23 | 0.33** | 0.45*** | 0.18 | 0.25* | 0.25* | | |
| 10. Performing well on rounds and courses. | 0.60*** | 0.29* | 0.37** | 0.38** | 0.44*** | 0.15 | 0.17 | 0.17 | 0.76*** | |
| 11. Taking a day to relax each week. | 0.06 | 0.16 | 0.11 | 0.32** | -0.04 | 0.69*** | 0.43*** | 0.24* | 0.18 | 0.16 |

*Note.*
* indicates significance at the .05 level.
** indicates significance at the .01 level.
*** indicates significance at the .001 level.

Table 4

*Correlations between Goal Importance and Goal Progress Ratings of Mid-level Goals*

| | Progress Ratings | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Importance Ratings | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 1.  Performing well on board exams. | 0.41*** | 0.17 | 0.00 | 0.11 | 0.26* | -0.01 | -0.05 | 0.21 | 0.37** | 0.19 |
| 2.  Learning patient interaction. | 0.07 | 0.32** | -0.07 | 0.10 | -0.03 | 0.07 | 0.21 | 0.10 | -0.11 | -0.08 |
| 3.  Exercising regularly. | 0.20 | 0.18 | 0.65*** | 0.09 | 0.12 | -0.06 | 0.01 | 0.12 | -0.06 | -0.01 |
| 4.  Sleeping regularly. | 0.20 | 0.41*** | 0.11 | 0.51*** | -0.18 | 0.17 | 0.22 | 0.04 | 0.00 | 0.02 |
| 5.  Publishing research. | 0.35** | 0.07 | 0.21 | -0.05 | 0.68*** | -0.23 | 0.00 | 0.16 | 0.29* | 0.18 |
| 6.  Hanging out with friends regularly. | 0.19 | 0.09 | 0.07 | 0.26* | -0.29* | 0.61*** | 0.43** | 0.16 | 0.08 | 0.05 |
| 7.  Attending important family events. | 0.28* | 0.16 | 0.10 | 0.24 | 0.01 | 0.36** | 0.68*** | 0.10 | 0.16 | 0.04 |
| 8.  Managing a budget. | 0.21 | 0.12 | 0.15 | 0.12 | 0.05 | 0.09 | 0.33** | 0.59*** | 0.17 | 0.13 |
| 9.  Getting a good residency. | 0.31* | 0.13 | -0.04 | -0.04 | 0.21 | -0.05 | 0.18 | 0.35 | 0.30* | 0.12 |
| 10.  Performing well on rounds and courses. | 0.12 | 0.35** | 0.07 | -0.07 | 0.18 | -0.14 | 0.05 | 0.07 | 0.09 | 0.11 |
| 11.  Taking a day to relax each week. | 0.00 | 0.12 | -0.01 | 0.15 | -0.33** | 0.44*** | 0.36** | 0.10 | -0.19 | -0.11 |

*Note.  Importance ratings are on the vertical; progress ratings are on the horizontal.*
* indicates significance at the .05 level.
** indicates significance at the .01 level.
*** indicates significance at the .001 level.

Table 5

*Means, Standard Deviations, and Correlations of Person-level Variables*

| Variables | *M* | *SD* | Resilience | SWB | Work Burnout | Personal Burnout |
|---|---|---|---|---|---|---|
| 1.  Resilience | 3.97 | 0.49 | 0.92 | | | |
| 2.  SWB | 4.83 | 1.42 | 0.30* | 0.92 | | |
| 3.  Work Burnout | 3.05 | 0.79 | -0.20 | -0.50** | 0.92 | |
| 4.  Personal Burnout | 3.22 | 0.45 | -0.04 | -0.07 | -0.00 | 0.82 |

*Note.*  SWB is subjective well-being.  Alpha coefficients are on the diagonal.
* indicates significance at the .05 level.
** indicates significance at the .01 level.

Table 6

*Means, Standard Deviations, and Correlations of Aggregated Variables*

| Variables | *M* | *SD* | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|---|---|
| 1. Mid Goal Importance | 3.89 | 0.46 | | | | | | |
| 2. Mid Goal Progress | 3.18 | 0.62 | 0.47*** | | | | | |
| 3. Cluster Importance | 3.86 | 0.43 | 0.88*** | 0.43*** | | | | |
| 4. Cluster Progress | 3.21 | 0.65 | 0.43*** | 0.93*** | 0.48*** | | | |
| 5. Mid Goal Relatedness | 3.90 | 0.85 | 0.35** | 0.15 | 0.33** | 0.11 | | |
| 6. High Goal Importance | 4.41 | 0.70 | 0.22 | 0.22 | 0.23 | 0.23 | 0.12 | |
| 7. High Goal Progress | 3.39 | 0.92 | 0.29* | 0.52*** | 0.30* | 0.50*** | 0.06 | 0.36** |

*Note.*  "Mid Goal Relatedness" is the relatedness of mid-level goals between clusters.
* indicates significance at the .05 level.
** indicates significance at the .01 level.
*** indicates significance at the .001 level.

Table 7

*Correlations between Aggregated and Person-level Variables*

| Variables | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1. Mid Goal Importance | | | | | | | | | | |
| 2. Mid Goal Progress | 0.47*** | | | | | | | | | |
| 3. Cluster Importance | 0.88*** | 0.43*** | | | | | | | | |
| 4. Cluster Progress | 0.43*** | 0.93 | 0.48*** | | | | | | | |
| 5. Mid Goal Relatedness | 0.35** | 0.15 | 0.33** | 0.11 | | | | | | |
| 6. High Goal Importance | 0.22 | 0.22 | 0.23 | 0.23 | 0.12 | | | | | |
| 7. High Goal Progress | 0.29* | 0.52*** | 0.30* | 0.50*** | 0.06 | 0.36** | | | | |
| 8. Work Burnout | -0.09 | -0.36** | -0.10 | -0.37** | 0.07 | -0.10 | -0.38** | | | |
| 9. Personal Burnout | 0.21 | 0.09 | 0.19 | 0.06 | 0.09 | 0.17 | -0.01 | 0.00 | | |
| 10. Resilience | 0.27* | 0.46*** | 0.27* | 0.45*** | 0.40** | 0.24 | 0.15 | -0.20 | -0.04 | |
| 11. Subjective Well-being | 0.21 | 0.35** | 0.22 | 0.33** | 0.12 | 0.08 | 0.44*** | -0.50*** | -0.07 | 0.30* |

*Note.* "Mid Goal Relatedness" is the relatedness of mid-level goals between clusters.
* indicates significance at the .05 level.
** indicates significance at the .01 level.
*** indicates significance at the .001 level.

**Analyses**

  **Explicit versus implicit goal hierarchies.** Most of the hypotheses in the current

study concerned the relationships between mid-level goals and high-level goals. I

collected information about high-level goals both implicitly and explicitly to test the

differences between the relationships between mid-level goals with high-level goals.

Explicit high-level goals were identified and rated by the participants. Implicit high-level

goals (i.e., clusters) were identified post-hoc through a hierarchical agglomerative

clustering process. The clustering analysis grouped together the mid-level goals on the

basis of how much individuals thought the goals related to one another. The analysis

identified up to three clusters for each individual, representing an implicit higher order

goal that encompassed those mid-level goals in the cluster.

  **Hierarchical agglomerative clustering.** In order to evaluate participants'

implicit goal hierarchies, I analyzed paired comparison data using a technique called

hierarchical agglomerative clustering. Hierarchical agglomerative clustering refers to a

type of post hoc analysis that clusters together items on the basis of their similarities,

dissimilarities, or distance to/from one another. "Hierarchical" refers to a process of

clustering items together one step at a time over multiple steps rather than simultaneously

clustering every item together at once. "Agglomerative" refers to a bottom-up process in

which items start as their own 1-item clusters and are brought together on the basis of

distance from other items rather than being "divisive" in which all items are in one large

cluster and then separated.

  Participants in the current study rated each mid-level goal that the focus group

identified in comparison to each of the other mid-level goals. From this, I created a

dissimilarity matrix for each participant.  Then, using this dissimilarity matrix, I

calculated a Euclidian distance between each item and the other items.  I used Euclidian

distance as it is not only one of the more common measures of distance used for this

technique but also because Euclidean distance has the benefit of being able to be

interpreted as the physical distance between two points in Euclidean space.  At this point

in the clustering process, the two closest items (mid-level goals, in this case), were

clustered together.  Then, the next two closest items (mid-level goals and clusters) were

clustered together.  This process repeated until each participant had three clusters of mid-

level goals.

In the current study, the clusters identified by the clustering process are used to

represent implicit higher order goals, i.e., goals that were not explicitly stated.  At this

point, I was able to calculate information about the clusters, which was used in implicit

measures relating to higher order goals, for each participant, such as relatedness of the

mid-level goals within a cluster to one another, number of goals in each cluster, and

average values of importance and progress of the mid-level goals for the cluster.

**Multilevel modeling and aggregation.**  In the current study, participants had

data at more than one level of analysis.  That is, participants gave information on multiple

goals that pertained to them.  These data are nested within each participant.  In order to

evaluate Hypotheses 1-4, which concern goal data at Level 1, or the goal level, I used

multilevel models to account for the nested nature of the data.  The multilevel models I

tested only had Level 1 variables (predictors or outcomes) in them and no cross-level

interactions.  However, I still used multilevel modeling for these analyses that required it

on the basis of the ICC to account for the nested nature of the data with goals being nested within individuals.

Specifically, I first tested a null model for each hypothesis in which the data were nested to calculate an intraclass correlation coefficient (ICC) for the outcome in that hypothesis. The ICC explains the amount of variance in the outcome that rests at the group level, and I evaluated each ICC to determine if multilevel modeling was appropriate. I used a threshold of around ICC = .10 for this purpose. However, if an ICC was below .10 for an outcome, I tested still a multilevel model for the hypothesis for preciseness of results despite this being a more conservative analysis. Next, I examined each hypothesis using a random intercepts model. I did not test a random slopes model due to the few degrees of freedom in the study. Further, I used a restricted maximum likelihood approach for each multilevel analysis rather than a full maximum likelihood approach. I made this decision because the sample in the current study was small ($n = 66$), and restricted maximum likelihood is less biased in the estimation of variance parameters at smaller sample sizes, relative to maximum likelihood.

For Hypotheses 5-7, I had only person level outcomes. Thus, rather than using multilevel models to test these hypotheses, I aggregated Level 1 variables to the person level and ran regression models. To evaluate whether the Level 1 variables could be aggregated, I calculated an average deviation around mean (AD.M) for the relevant variables. The rule I used was that the variables had significant levels of agreement if the calculated AD .M value were below A / 6 (A divided by 6), where A is the number of response options (Dunlap, Burke & Smith-Crowe, 2003). For all variables for which I tested an AD.M, the number of response options was 5. Thus, I considered any

calculated AD.M values that were below .833 to have a significant level of agreement such that that variables could be aggregated to the person level.

**Hypothesis Testing**

**Hypothesis 1.** Hypothesis 1a stated that the goal importance of mid-level goals would be positively related to the perceived goal progress of those mid-level goals. Because mid-level goals were nested within participants, I calculated an ICC for mid-level goal progress and found that participants explained 8.17% ($ICC = .08$) of the variance. This ICC was close enough to my threshold of .10 to warrant a multilevel analysis. To test Hypothesis 1a, I regressed goal progress on goal importance using a random intercepts multilevel model. Results showed a positive, significant relationship between mid-level goal importance and progress, supporting Hypothesis 1a (See Table 8).

Table 8

*Multilevel models for Hypotheses 1 and 2*

| **Hypothesis 1a** | Mid-level Goal Progress | | |
|---|---|---|---|
| | *b* | *S.E.* | *t* |
| Intercept | 2.44 | 0.13 | 18.12*** |
| Mid-level Goal Importance | 0.30 | 0.04 | 8.41*** |

| **Hypothesis 1b** | High-level Goal Progress | | | Cluster Progress | | |
|---|---|---|---|---|---|---|
| | *b* | *S.E.* | *t* | *b* | *S.E.* | *t* |
| Intercept | 0.75 | 0.27 | 2.73** | 2.65 | 0.23 | 11.36*** |
| High-level Goal Importance | 0.76 | 0.06 | 11.84*** | 0.22 | 0.06 | 3.54*** |

| **Hypothesis 2a** | High-level Goal Accomplishment | | |
|---|---|---|---|
| | *b* | *S.E.* | *t* |
| Intercept | 1.04 | 0.11 | 9.67*** |
| Mid-level Goal Importance | 0.66 | 0.03 | 22.64*** |
| Intercept | 0.96 | 0.10 | 9.65*** |
| Mid-level Goal Progress | 0.63 | 0.03 | 21.35*** |

| **Hypothesis 2b** | Average Goal Accomplishment | | |
|---|---|---|---|
| | *b* | *S.E.* | *t* |
| Intercept | 2.32 | 0.13 | 17.21*** |
| Mid-level Goal Importance | 0.36 | 0.04 | 10.02*** |
| Intercept | 2.19 | 0.13 | 17.10*** |
| Mid-level Goal Progress | 0.31 | 0.04 | 8.62*** |

*Note.*
* represents significance at the .05 level.
** represents significance at the .01 level.
*** represents significance at the .001 level.

Hypothesis 1b stated that goal importance of high-level goals would be positively related to high-level goal progress. I tested this hypothesis in two ways. In the first method, I regressed the high-level goal progress on high-level goal importance using explicitly stated high-level goals. In the second method, I used the implicitly stated high-level goals (i.e., clusters), regressing cluster progress on cluster importance. Because both high-level goals and clusters are nested within participants, I calculated an ICC for high-level goal progress and for cluster progress. Results revealed that participants explained 19.75 % ($ICC$ = .20) of the variance in high-level goal progress as well as 22.57% ($ICC$ = .23) of variance in cluster progress. Because of the substantial ICCs for these variables, I used a random intercepts multilevel model to test Hypothesis 1b. In both methods, high-level goal importance was positively related to high level goal progress, supporting Hypothesis 1b through both the explicitly stated higher order goals and the implicit clusters (See Table 8).

**Hypothesis 2.** Hypothesis 2a stated that the importance of mid-level goals would be positively related to the importance of the high-level goals under which those mid-level goals are aligned. Further, Hypothesis 2b stated that the importance of mid-level goals would be positively related to the extent to which mid-level goals served to accomplish higher order goals. Due to the nature of the cluster importance values being an average of mid-level goal average values, I was only able to test these hypotheses using explicitly stated high-level goals. Also, because participants were allowed to align mid-level goals under multiple high-level goals to varying extents, I took a different approach to testing these hypotheses.

For Hypothesis 2a, I examined how mid-level goal importance related to high-level goal accomplishment (i.e., the extent to which mid-level goals served to accomplish an individual's most important high-level goal). For Hypothesis 2b, I examined how mid-level goal importance related to average goal accomplishment (i.e., the average extent to which mid-level goals served to accomplish an individual's high-level goals). I calculated ICCs for both high-level goal accomplishment and average goal accomplishment and found that participants explained 12.56% ($ICC = .13$) and 9.76% ($ICC = .10$) of the variance in high-level goal accomplishment and average goal accomplishment, respectively. Due to the ICCs of each variable, I used a random intercepts multilevel model to evaluate Hypothesis 2a and 2b. Results demonstrated a positive, significant relationship in both cases, supporting Hypotheses 2a and 2b in the capacity to which I could test them. Additionally, results demonstrated a significant, positive relationship between mid-level goal progress and both high-level goal accomplishment and average goal accomplishment (See Table 8).

**Hypothesis 3.** Hypothesis 3a stated that the number of mid-level goals within a goal cluster would be negatively related to the average mid-level goal importance of that cluster. Because mid-level goals were allowed to be connected to multiple higher level goals in an individual's explicit goal hierarchy, I was only able to test this hypothesis and Hypothesis 3b using implicit goal hierarchies, i.e., using clusters. I regressed the average mid-level goal importance of a cluster on the number of mid-level goals within that cluster using a multilevel model. Participants explained 0% ($ICC = .00$) of the variance in cluster importance. This low ICC did not warrant a multilevel analysis. However, I tested Hypothesis 3a using a random intercepts multilevel model to have an analysis

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more parallel to the other goal-related analyses. Despite using a more conservative analysis than was necessary, I found a significant negative effect between number of mid-level goals within a cluster and cluster importance, lending support to Hypothesis 3a (See Table 9).

Hypothesis 3b stated that the number of mid-level goals within a goal cluster would be positively related to the variance in mid-level goal importance of that cluster. Participants explained 0% (*ICC* = .00) of the variance in within cluster mid-level goal variance. Similar to Hypothesis 3a, this ICC again did not warrant a multilevel analysis. However, I tested a random intercepts multilevel model again to be parallel and consistent with other analyses. I regressed average variance of mid-level goals within a cluster on the number of goals within that cluster. Results demonstrated a significant, positive relationship, supporting Hypothesis 3b.

Table 9

*Multilevel models for Hypotheses 3 and 4*

| **Hypothesis 3a** | Average Mid-level Goal Importance | | |
| --- | --- | --- | --- |
| | *b* | *S.E.* | *t* |
| Intercept | 5.61 | 0.42 | 13.46[***] |
| Number of Mid-level Goals | -0.50 | 0.11 | -4.46[***] |
| **Hypothesis 3b** | Mid-level Goal Variance | | |
| | *b* | *S.E.* | *t* |
| Intercept | 1.24 | 0.19 | 6.45[***] |
| Number of Mid-level Goals | 0.86 | 0.09 | 9.58[***] |
| **Hypothesis 4** | Cluster Progress | | | Cluster Importance | | |
| | *b* | *S.E.* | *t* | *b* | *S.E.* | *t* |
| Intercept | 2.96 | 0.23 | 12.93 | 3.04 | 0.34 | 9.00[***] |
| Mid-level Goal Relatedness | 0.10 | 0.06 | 1.83 | 0.27 | 0.09 | 3.08[**] |

*Note.*
[**] represents significance at the .01 level.
[***] represents significance at the .001 level.


**Hypothesis 4.** Hypothesis 4 stated that the relatedness of mid-level goals within a set or cluster of goals would be positively related to high-level goal progress. Similar to Hypothesis 3, I was only able to test Hypothesis 4 using individuals' implicit goal hierarchies. As was determined in Hypothesis 1b, cluster progress had an ICC of .23 and warranted the use of a multilevel analysis. I used a random intercepts multilevel model to regress goal cluster progress on the relatedness of the mid-level goals within that cluster. Results demonstrated no significant relationship between the two variables. Hypothesis 4

was not supported.  However, additional analyses did reveal a significant, positive

relationship between goal cluster importance and the relatedness of mid-level goals

within that cluster (See Table 9).

**Hypothesis 5.**  Hypothesis 5 stated that goal relatedness within a cluster of mid-

level goals would be negatively related to symptoms of burnout.  Similar to Hypotheses 3

and 4, I could only test this hypothesis using individuals' implicit goal hierarchies.  Due

to the nature of the burnout measure being at the person level, I first calculated an AD.M

for goal relatedness to determine if the goal relatedness values for each cluster could be

aggregated to the individual level.  The AD.M was sufficient for aggregation (.82).  After

aggregation, I regressed work-related burnout and personal burnout on goal relatedness.

Results showed no significant relationship between goal relatedness and either burnout

measure.  Thus, Hypothesis 5 was not supported (See Table 10).

Table 10

*Regression models for Hypotheses 5, 6, and 7*

| **Hypothesis 5** | Work Burnout | | | Personal Burnout | | |
|---|---|---|---|---|---|---|
| | *b* | *S.E.* | *t* | *b* | *S.E.* | *t* |
| Intercept | 2.78 | 0.46 | 5.99*** | 3.04 | 0.26 | 11.48*** |
| Mid-level Goal Relatedness | 0.07 | 0.12 | 0.58 | 0.05 | 0.07 | 0.72 |
| **Hypothesis 6** | Work Burnout | | | Personal Burnout | | |
| | *b* | *S.E.* | *t* | *b* | *S.E.* | *t* |
| Intercept | 3.63 | 5.16 | 0.71 | 0.62 | 2.91 | 0.21 |
| Mid-level Goal Relatedness | 0.09 | 1.29 | 0.07 | 0.47 | 0.73 | 0.65 |
| High-level Goal Importance | -0.26 | 1.34 | -0.20 | 0.66 | 0.75 | 0.87 |
| Relatedness x Importance | 0.00 | 0.33 | 0.01 | -0.12 | 0.19 | -0.63 |
| **Hypothesis 7** | Work Burnout | | | Personal Burnout | | |
| | *b* | *S.E.* | *t* | *b* | *S.E.* | *t* |
| Intercept | 3.69 | 2.36 | 1.56 | 3.60 | 1.44 | 2.50* |
| High-level Goal Importance | -0.12 | 0.84 | -0.14 | -0.29 | 0.51 | -0.56 |
| High-level Goal Progress | 0.12 | 0.53 | 0.23 | -0.05 | 0.32 | -0.15 |
| Importance x Progress | -0.05 | 0.18 | -0.28 | 0.06 | 0.11 | 0.50 |

*Note.*
* represents significance at the .05 level.
*** represents significance at the .001 level.

**Hypothesis 6.**  Hypothesis 6 stated that the importance of high-level goals would

moderate the relationship between mid-level goal relatedness and burnout such that the

relationship would be more strongly negative at higher levels of high-level goal importance. As I did for Hypothesis 5, I calculated an AD.M for high-level goal importance to determine if it could be aggregated to the person level. The AD.M was sufficient (.74). After aggregating high-level goal importance and mid-level goal relatedness, I examined main effects of these variables on work burnout and personal burnout. However, results revealed no significant main effects (See Table 11). After, I regressed work-related and personal burnout on goal relatedness, high-level goal importance, and their interaction term. Results revealed no significant moderation relationship, providing no support for Hypothesis 6 (See Table 10).

**Hypothesis 7.** Hypothesis 7 stated that goal progress would be more strongly and negatively related to burnout at higher levels of goal importance. For this hypothesis, I calculated an AD.M for high-level goal progress to determine if it could be aggregated to the person level. The AD.M was sufficient (.80). After aggregating high-level goal progress and high-level goal importance, I examined main effects of these variables on work burnout and personal burnout. Results revealed a main effect of goal progress on work burnout (See Table 11). After, I regressed work and personal burnout on high-level goal importance, high-level goal progress, and their interaction term. Results demonstrated no significant moderation effect, and the main effect of goal progress on work burnout disappeared with the introduction of the interaction term (See Table 10).

For additional analyses related to Hypotheses 6 and 7 and the relationship between high-level goal importance, high-level goal progress, and person-level variables, see Table 11.

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Table 11

*Main Effects of Importance and Progress on Person-level Variables*

| Variables | W. Burnout | | P. Burnout | | Resilience | | SWB | |
|---|---|---|---|---|---|---|---|---|
| | *b* | *t* | *b* | *t* | *b* | *t* | *b* | *t* |
| Mid-level Goal Importance | -.16 | -.75 | .21 | 1.75 | .28 | 2.22[*] | .66 | 1.74 |
| Mid-level Goal Progress | -.46 | -3.06[**] | .06 | .50 | .36 | 4.13[***] | .81 | 3.01[**] |
| Cluster Importance | -.18 | -.77 | .20 | 1.58 | .30 | 2.24[*] | .71 | 1.79 |
| Cluster Progress | -.45 | -3.20[**] | .04 | .62 | .34 | 4.06[***] | .72 | 2.80[**] |
| Mid-level Goal Relatedness | .07 | .58 | .05 | .72 | .23 | 3.54[***] | .20 | .97 |
| High-level Goal Importance | -.11 | -.75 | .11 | 1.23 | .17 | 1.80 | .16 | .63 |
| High-level Goal Progress | -.33 | -3.05[**] | -.00 | -.06 | .08 | 1.11 | .67 | 3.62[***] |

*Note.*
[*] indicates significance at the .05 level.
[**] indicates significance at the .01 level.
[***] indicates significance at the .001 level.

## Discussion

**Study Purpose**

The purpose of the current study was twofold. First, a primary aim of the study was to examine how the structure of goal hierarchies and the relationships between goals, both mid-level and high-level, related to important outcomes, namely goal progress and burnout. A secondary aim of the study was to examine goal hierarchies using an explicit method (i.e., asking participants to identify and rate high-level goals) and an implicit method (i.e., identifying post-hoc sets of related mid-level goals using a clustering

analysis on comparisons made between the mid-level goals).  Concerning those two main purposes of the current study, there were a number of relevant findings.

First, results revealed that goal importance was positively related to goal progress, whether examining mid-level goals themselves, clusters of implicitly identified goal sets, or high-level goals explicitly identified by the participants.  This provides further support to the basic idea common in the literature that individuals will put effort toward completing goals that are important to them, whether these goals are specific, mid-level goals or more abstract, longer term high-level goals.

Further, the current study demonstrated that mid-level goals and high-level goals are intricately connected.  Specifically, results showed that mid-level goal importance was positively related to the extent to which the goal helped individuals to progress toward or accomplish important, high-level goals.  Further, mid-level goals that helped individuals accomplish more high-level goals on average were considered by the individual to be more important than goals that did not facilitate progress toward the individual's high-level goals.

As well, the number of goals within a set of mid-level goals had implications for how an individual perceived those goals.  That is, in goal sets that had a larger number of mid-level goals, these mid-level goals varied more greatly in terms of goal importance.  Additionally, the greater the number of mid-level goals within a set, the less the average importance any mid-level goal within that set was.  This provides evidence that when individuals have a multitude of options for accomplishing their important, high-level goals, any one option might not be highly important to the individual and different options might not be equally important.  Similarly, when there are only a few mid-level

goals that are related and facilitate accomplishment of a high-level goal, those mid-level goals are considered more important, perhaps by necessity. Further, results revealed that whereas the relatedness of the goals within a set of goals was not related to the average progress of that set of goals, it was negatively related to the average importance of that goal set. This supports the idea that the more distinct goals are within a set of goals, the more important the goals are on average.

In the current study, I hypothesized also that goal importance would moderate the relationships between goal relatedness and burnout as well as between goal progress and burnout, such that these relationships would be more strongly negative at higher levels of goal importance. However, I did not find moderation effects, perhaps because of the small final sample size ($N = 66$) for the analyses. Despite this, results revealed several main effects of goal progress on burnout. Specifically, lower perceptions of goal progress meant higher levels of work-related burnout. Further, goal progress was positively related to life satisfaction. This pattern of results was present whether examining mid-level goals alone, implicitly identified clusters of mid-level goals, or explicitly identified high-level goals. This supports the idea that a lack of progress toward important goals might contribute toward a state of burnout and a decreased sense of life satisfaction. Additionally, participants who were higher in resilience were found in general to perceive higher progress toward their goals and experience fewer symptoms of work-related burnout or decreased life satisfaction.

**Implications**

The current study has three major implications. First, there are aspects of an individual's goal hierarchy not often examined but relevant to the perceived importance

of an individual's goals as well as the progress the individual believes he or she is making toward those goals. The current study provides three examples of this in examinations of the relatedness between mid-level goals, the number of goals within an individual's goal set, and the extent to which an individual's mid-level goals relate to important, higher order goals. Knowing these aspects of an individual's goal hierarchy led to a greater understanding of goals the individual perceives to be important and which goals the individual is pursuing and making progress toward. For example, knowing which high-level goals an individual holds can give insight as to which mid-level, specific goals the individual might consider important and be motivated to pursue. Additionally, knowing which goals an individual considers to be related to one another may provide insight into why an individual might pursue some goals more actively relative to other goals.

Second, the current study reinforces several ideas concerning burnout, particularly work-related burnout. Individuals who were higher in trait resilience perceived more progress toward their important mid-level goals. Further, those who perceived more progress toward their mid-level goals generally reported less work-related burnout and greater life satisfaction. These results propose a possible pathway through which resilience might affect burnout and life satisfaction. As well, the current study identified perceived lack of progress toward important goals as a possible antecedent of burnout and decreased life satisfaction. This suggests the potential usefulness of goal-related variables, such as perceived goal progress, in interventions in school or work settings to decrease or relieve symptoms of work-related burnout and decreased life satisfaction. However, further research must be conducted to examine the mechanisms of these relationships.

Third, the current study investigated goal hierarchies that were identified explicitly as well as constructed implicitly through a clustering analysis. Although not all hypotheses of the current study could be tested using both hierarchies, the pattern of results was the same for both explicit and implicit goal hierarchies when the analyses were able to be performed both ways. Further, by using these two methods, I was able to collect different information concerning relationships between mid-level goals with one another and with high-level goals. This suggests the potential benefits of using multiple methods to gather reliable goal hierarchy data.

**Limitations**

There are several limitations of the current study. First and most notably, the study had a small final sample size ($n = 66$). Although small, this sample size was a good proportion (60%) of the total population of third-year medical school students who could have participated in the study ($N = 110$). The sample size was sufficient for examining main effects in the multilevel analyses, but it was low in power for tests of moderation effects. Specifically, this made it difficult to evaluate Hypotheses 6 and 7.

Second, the current study used a list of 11 mid-level goals identified by a focus group as relevant to most medical school students. Whereas this ensured that the study used a concise list of goals that were applicable to the participants, using goals identified by a focus group also introduced potential range restriction into the study in terms of goal importance. That is, the majority of the mid-level goals already held high importance to most of the participants, i.e., third-year medical school students. Descriptive statistics indicated that goal importance was on average higher than other goal variables (e.g., goal progress) and had a smaller standard deviation. This possible range restriction, in

addition to the small sample size of the study, made it difficult to determine whether goal importance moderated relationships as hypothesized in Hypotheses 6 and 7. However, I made the decision to use a list of mid-level goals that was reasonably small, concise, and relevant to the participants to ensure that the participants were not overly burdened by the workload of participating in the study, given their already considerable workload as medical school students and higher rates of burnout as a population. Future researchers can avoid this limitation through the introduction of more goals as well as goals intentionally chosen to have greater variability in importance among the participant pool.

A third limitation is that my study was a correlational and cross-sectional study and not experimental or longitudinal. Similar to the second limitation, this was an intentional design choice to limit the workload of the participants. This design choice precluded the determination of causation in the tested relationships between study variables. Also, the chosen design precluded the examination of changes in goal pursuit and self-regulation over time, such as the reevaluation of goals and the closeness of deadlines. Thus, there are several avenues for future research. For example, researchers could manipulate the importance and the motivation to pursue mid-level goals to examine potential causal effects on outcomes such as goal progress and burnout. Also, researchers could collect goal data and burnout data from participants over several time points, ideally relative to the context of deadlines for specific, mid-level goals.

**Conclusion**

Goal setting and goal pursuit are important areas of study in the psychological literature for the understanding of an individual's performance, burnout, and well-being. Further, the examination of an individual's goal hierarchy is less common, but it provides

valuable information needed to better understand the effects of goals on important outcomes. That is, the relationships between mid-level goals within goal sets, the relationships between goals regardless of goal sets, and the relationships between mid-level and higher level goals all serve to explain which goals an individual deems important and will pursue as well as subsequent progress toward accomplishing goals. As well, perceived progress on these important goals is highly relevant to an individual's state of burnout and sense of well-being. Thus, my research on the effects of goal hierarchies on performance and burnout holds important implications for the study and understanding of individuals' perceptions of goals, and my research identifies potential areas as a focus for the prevention or relief of work-related burnout. My research provided evidence that a lack of perceived goal progress is related to burnout, that the relatedness between mid-level goals with one another and high-level goals influences our perceptions of the importance of these mid-level goals, that explicit and implicit goal hierarchies give overlapping but unique results and allow for the examination of different aspects of an individual's goal hierarchies, and finally that aspects of goals (e.g., hierarchical structure, importance, perceived progress, relatedness) enhance our understanding of goal effects and might be a mechanism through which resilience affects important outcomes such as performance and burnout.

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**Appendix A**

**Mid-level Goal Importance**

INSTRUCTIONS:  Below are specific goals that are common to many medical school students.  Please use the following rating scale to indicate how important each goal is to you.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not at all | A little bit | Moderately | Quite a bit | To a great extent |

1. Performing well on board exams.

2. Learning patient interaction.

3. Exercising regularly.

4. Sleeping regularly.

5. Publishing research.

6. Hanging out with friends regularly.

7. Attending important family events.

8. Managing a budget.

9. Getting a good residency.

10. Performing well on rounds and courses.

11. Taking a day to relax each week.

**Appendix B**

**Mid-level Goal Progress**

INSTRUCTIONS:  Below are 10 specific goals that are common to many medical school students.  Please use the following rating scale to indicate the extent to which **you are making progress** on each goal.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not at all | A little bit | Moderate progress | Quite a bit | A lot of progress |

1.  Performing well on board exams.

2.  Learning patient interaction.

3.  Exercising regularly.

4.  Sleeping regularly.

5.  Publishing research.

6.  Hanging out with friends regularly.

7.  Attending important family events.

8.  Managing a budget.

9.  Getting a good residency.

10.  Performing well on rounds and courses.

11.  Taking a day to relax each week.

**High-level Goals**

<u>INSTRUCTIONS:</u>  The specific goals you have been presented with so far are specific goals that may be completed.  However, some goals might be more abstract.  These abstract goals likely encompass the more specific goals presented earlier in the study.  In other words, the more specific goals might serve to accomplish these superordinate, abstract goals.  Please think of **two (2)** to **four (4)** goals that are more **abstract** and are relevant to you.  Use the blanks below to fill in **abstract** goals.  If you do not need all four blanks, use only those that you need.

1. _____

2. _____

3. _____

4. _____

**Appendix D**

**High-level Goal Importance**

<u>INSTRUCTIONS:</u>  Below are the two to four abstract goals that you specified previously.  Please use the following rating scale to indicate the extent to which each abstract goal is important to you.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not at all | A little bit | Moderately | Quite a bit | To a great extent |

1. First identified abstract goal

2. Second identified abstract goal

3. Third identified abstract goal

4. Fourth identified abstract goal

**Appendix E**

**High-level Goal Progress**

INSTRUCTIONS:  Below are the two to four abstract goals that you specified previously.  Please use the following rating scale to indicate the extent to which you feel that you are making progress toward that goal.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not at all | A little bit | Moderate progress | Quite a bit | A lot of progress |

1. First identified abstract goal

2. Second identified abstract goal

3. Third identified abstract goal

4. Fourth identified abstract goal

**Mid-level Goal Relatedness**

INSTRUCTIONS: Below are pairs of specific goals that are common to many medical school students. Please use the following rating scale to indicate the extent to which each goal is related to the paired goal.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not at all | A little bit | Moderately | Quite a bit | To a great extent |

For each pairing of the following goals:

1.  Performing well on board exams.

2.  Learning patient interaction.

3.  Exercising regularly.

4.  Sleeping regularly.

5.  Publishing research.

6.  Hanging out with friends regularly.

7.  Attending important family events.

8.  Managing a budget.

9.  Getting a good residency.

10.  Performing well on rounds and courses.

11.  Taking a day to relax each week.

**Appendix G**

**Mid-level Goal Accomplishment of High-level Goals**

INSTRUCTIONS:  Below are the two to four abstract goals that you specified previously as well as a list of 10 specific goals common to many medical school students.  Please use the following rating scale to indicate the extent to which you believe that each specific goal in the list is important to accomplishing an abstract goal that you specified.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not at all | A little bit | Moderately | Quite a bit | To a great extent |

For each identified abstract goal:

1.  Performing well on board exams.

2.  Learning patient interaction.

3.  Exercising regularly.

4.  Sleeping regularly.

5.  Publishing research.

6.  Hanging out with friends regularly.

7.  Attending important family events.

8.  Managing a budget.

9.  Getting a good residency.

10.  Performing well on rounds and courses.

11.  Taking a day to relax each week

**Copenhagen Burnout Inventory**

INSTRUCTIONS:  Below are questions relating to your state of personal and work-related exhaustion.  Please use the following rating scales to answer each question.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Never/Almost Never | Seldom | Sometimes | Often | Always |

1.  How often do you feel tired?
2.  How often are you physically exhausted?
3.  How often are you emotionally exhausted?
4.  How often do you think:  "I can't take it anymore?"
5.  How often do you feel worn out?
6.  How often do you feel weak and susceptible to illness?
7.  Do you feel worn out at the end of the working day?
8.  Are you exhausted in the morning at the thought of another day at work?
9.  Do you feel that every working hour is tiring for you?
10.  Do you have enough energy for family and friends during leisure time?[*]

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| To a Very Low Degree | To a Low Degree | Somewhat | To a High Degree | To a Very High Degree |

11.  Is your work emotionally exhausting?
12.  Do you feel burnt out because of your work?
13.  Does your work frustrate you?

[*]*Reverse coded.*
*Note:  Questions 1-6 measure personal burnout.  Questions 7-13 measure work-related burnout.*

Kristensen, T. S., Borritz, M., Villadsen, E., & Christensen, K. B. (2005).  The Copenhagen Burnout Inventory:  A new tool for the assessment of burnout. *Work & Stress, 19*(3), 192-207.

**Resilience Scale**

<u>INSTRUCTIONS:</u> The questions in this scale ask you about your feelings and thoughts. For each question, please use the following rating scale to indicate how often you felt or thought a certain way.

| 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|
| Not True at All | Rarely True | Sometimes True | Often True | True Nearly All of the Time |

1. I am able to adapt to change
2. I have close and secure relationships
3. I believe that sometimes fate or God can help
4. I can deal with whatever happens
5. I believe that past success gives confidence for new challenge
6. I am able to see the humorous side of things
7. I think that coping with stress strengthens my ability to deal with the stress
8. I tend to bounce back after illness or hardship
9. I believe things happen for a reason
10. I give my best effort no matter what
11. I believe I can achieve my goals
12. When things look hopeless, I don't give up
13. I know where to turn for help
14. When under pressure, I am able to focus and think clearly
15. I prefer to take the lead in problem solving
16. I am not easily discouraged by failure
17. I think of myself as strong person
18. I make unpopular or difficult decisions
19. I can handle unpleasant feelings
20. I have to act on a hunch
21. I have a strong sense of purpose
22. I am in control of my life
23. I like challenges
24. I work to attain my goals
25. I take pride in my achievements

Connor, K. M., & Davidson, J. T. (2003). Development of a new resilience scale: The Connor-Davidson Resilience Scale (CD-RISC). *Depression and Anxiety, 18*(2), 76-82.

**Subjective Well-being:  Satisfaction with Life Scale**

INSTRUCTIONS:  Below are five statements with which you may agree or disagree.
Using the rating scale given below, indicate the extent to which you agree or disagree
with the item.

| 1 | 2 | 3 | 4 | 5 | 6 | 7 |
|---|---|---|---|---|---|---|
| Strongly Disagree | Disagree | Slightly Disagree | Neither Agree nor Disagree | Slightly Agree | Agree | Strongly Agree |

1.  In most ways my life is close to my ideal.
2.  The conditions of my life are excellent.
3.  I am satisfied with my life.
4.  So far I have gotten the important things I want in life.
5.  If I could live my life over, I would change almost nothing.

Diener, E., Emmons, R. A., Larsen, R. J., & Griffin, S. (1985).  The satisfaction with life
scale. *Journal of Personality Assessment, 49*(1), 71-75.

**Appendix K**

**Demographics**

1.  What is your current age?

    _____ years of age

2.  What is your gender?

    1.  Male      2.  Female

3.  What is your desired medical profession?

    _____

4.  What is your race?

    1.  White/Caucasian      2.  Black/African American      3.  Asian/Pacific
    4.  Hispanic             5.  Native American             6.  Other