ABSTRACT

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The present work investigated the generation of behavioral plans when multiple goals are activated. The simultaneous presence of several goals may introduce goal-conflict, implying the need to exercise goal choice. Such conflict may be avoided via "multifinal" means affording the joint pursuit of the conflicting goals. Multifinal means are likely to constitute a subset of the total set of means to the focal goal. Concentrating attention on those means should reduce the number of means to the focal goal. This should introduce instability in one's means preferences as function of the alternative goals that happened to be activated. These notions were empirically tested in three studies. Study 1 indicated that a subtle reminder of goal-alternatives narrowed the means' set to the current goal of "having lunch" to means that afforded successful attainment of this goal while saving time for other goals. Study 2 and 3 explored two boundary conditions of such multifinality-based narrowing of the focal-means set size namely, (1) feasibility of identifying multifinal

means given the nature of the co-active goals and (2) degree of commitment to the focal goal. Specifically, Study 2 found that the relation between perceived feasibility of finding multifinal means and the reduction in the means' set-size selected for the focal goal is curvilinear. In other words, substantial reduction may occur at an intermediate range of feasibility, while no reduction may occur where finding alternative means is either highly feasible or relatively unfeasible. Finally, Study 3 found that high commitment to the focal goal results in the inhibition of the alternative goal relaxing its multifinality constraints and allowing the set of focal means to assume the size it would have in the absence of the alternative goal.

THE QUEST FOR MULTIFINALITY IN GOAL PURSUIT.

By

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Dedication

I want to dedicate this work to my dear parents without whom I wouldn't be here

today and to my adorable daughter Mara who taught me the true meaning of

"multifinality".

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I would like to thank above all Arie Kruglanski, my mentor. His wisdom was truly inspiring, his enthusiasm was contagious, and his patience and support throughout my graduate career were invaluable. I want to thank Arie not only for teaching me innumerable lessons about academic research, and insights into its workings but for offering me many moments of pure intellectual enjoyment which made the usual obstacles and frustrations associated with graduate training insignificant.

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Introduction

Lay and scientific notions of motivation have long acknowledged that goal pursuit may be affected by the simultaneous presence of alternative goals. Often such circumstance was characterized in terms of goal-conflict whose resolution demands the exercise of choice between clashing objectives. An early such analysis was offered by the 14th Century French philosopher Jean Buridan who satirized it in a well known parable. It recounts the tale of a hungry ass standing between two equally appetizing bales of hay. Although obviously motivated to eat, the ass is unable to choose, and eventually dies of hunger in the face of bounty (see Turner, 1903).

Classic motivational research too, has demonstrated that the presence of alternative goals creates conflict that may hamper progress toward any one of the present objectives (Lewin, 1935, 1951; Miller, 1944; Emmons & King, 1988; Van Hook & Higgins, 1988). More recently, Shah and Kruglanski (2002) showed that priming an alternative to a focal goal may "pull" away the resources invested in its pursuit, undermining goal-commitment, progress, the development of effective means to goal attainment, and suppressing affective responses to feedback about goal-progress. In short, a concomitance of different goals might tax one's available resources. In such circumstances, the pursuit of one goal might mean sacrificing the others.

Given the unpleasant possibility of having to give up on some of their goals, people may seek "multifinal" means believed to promote their concurrent attainments, allowing one to "have one's cake and eat it too" (Kruglanski, Shah, Fishbach, Friedman, Chun, & Sleeth-Keppler, 2002). Indeed, a quick look at people's daily routine will

provide numerous examples of such quest for multifinal means. For instance, laptop computers allow people to travel while getting work done, checking our e-mails and paying the bills. Driving and "reading" at the same time became possible through audio books. With cellular phone in hand, Japanese consumers can purchase from vending machines, buy train tickets, order a bowl of noodles, trade stock, bid at online auctions and change channels on a TV set.

As depicted above, multifinality concerns make a great deal of sense, and exemplify the simple rationality of maximizing the returns on one's investments, or increasing the "bang for one's buck". What makes this process psychologically interesting is the possibility that the multifinality quest may induce instability in one's preferences for means to the same goal, depending on the currently activated goal alternatives. The present work aims to elucidate that nature of such a "multifinality quest" and to investigate its consequences. The perspective that I adopt emphasizes the cognitive aspects of motivational phenomena embodied in the notion of goal systems. First, I will place my work in the broader historical context of social psychological theorizing about motivation and cognition. I will then present a series of empirical investigations on the consequences of multifinality quest in multiple goal pursuit and two of its boundary conditions having to do with 1) feasibility of locating multifinal means given the relationship between the co-active goals and 2) degree of commitment to the focal goal.

I. Motivational Theorizing in Social Psychology

I. 1. *Classic Motivational Theorizing in Social Psychology.*

The concepts of goals and motivation have been present in psychological theorizing and research throughout the history of psychology as a field of inquiry. Indeed, self-regulation has been long recognized as one of the most important aspects of human existence. Deciding which goals to pursue and engagement in goal-directed action is a fundamental process underlying many of the person's daily thoughts feeling and behaviors . The first half of the 20th century was dominated by Freudian and behaviorist models of self-regulation which held respectively that behavior is determined either by biological impulses and unconscious conflicts, or by the external environment. In his classical study, *Beyond the Pleasure Principle*, Freud (1920, 1990) portrays human behavior as driven by two *inherent*, conflicting desires, the life drive (*Eros*) and the death drive (*Thanatos*). By contrast, behaviorists conceived of action as *externally* motivated. Goals were assumed to be approached in terms of incentives for goal directed action. Although they never doubted that subjective goals may affect a person's behavior, the behaviorists contended that "motivation" lies *outside* the individual in the form of reinforcements and punishments (Locke & Latham, 2002). As a consequence, the behaviorists were less interested in goal-setting, goal representation, or the mechanisms underlying the effects of goals on behavior, and were rather focused on the observable features of goal-directed behavior, such as persistence, appropriateness, and search (Tolman, 1925; Bindra, 1957).

Modern theoretical perspectives that highlight the need to analyze goal-directed actions in relation to people's subjective goals have their own precursors that reach beyond the behaviorism era. James (1890) in his *Principles of Psychology* included a chapter on the will and touched on many key issues of concern to present day goal theorists. James defined the phenomena of interest to psychologists as including feelings, desires and cognitions and suggested that "the pursuance of future ends and the choice of means for their attainment are …the mark and criteria of the presence of mentality in a phenomenon" (p. 8). By contrast to the behaviorists, according to James individual's *subjective goal* is the reference point for goal-directed action rather than a powerful incentive in the external environment. The critical question raised by James is whether people meet their goals (despite the obstacles), and not whether their actions toward an incentive carry features of persistence, appropriateness and searching.

The impact of *subjective goals* has been further acknowledged and analyzed by McDougall, (1908). He stressed the role of cognition in analyzing the current state and in envisioning the event or goal state to be realized. The humanistic movement, in particular Rogers (1951) self-theory, explicitly placed the conscious "self" as the most important causal agent in goal-directed action. Behavior, according to Rogers is not driven by the environment or by nonconscious forces but rather by an active "self" that mediates between the environment and behavior.

The issue of goal-directed behavior played an important role in German will psychology as well. For instance, Ach (1935) attempted to establish a scientific analysis of the phenomenon of volitional action or willing. Ach introduced the concept of determination to explain how intentions are translated into intended actions and defined it

as the existence of mental linkages between an anticipated situation and a concrete intended behavior. In this conception, a "determining tendency" would urge a person to execute an action when encountering the specified situational stimulus.

Social psychologists have long recognized the power of current goal states to determine what situational stimuli will be attended to and what meaning they will have for the individual. Kurt Lewin (1935) argued that "a strongly accented goal so transforms the situation that practically all objects acquire a reference to this goal" (p. 102). The influence of goals and motives on perception was a major theme of the New Look research (see Bruner, 1957; Jones and Thibaut, 1958). The perceiver's current goals and physiological needs were considered a primary determinant of the accessibility of perceptual categories, and hence of perceptual selectivity and categorization inputs.

Particularly relevant to modern theorizing about goals is Lewin's work on *goal tension systems* (Lewin, 1935). In his view, one's needs (goals) create a tension that propels one to action designed to reduce it. The amount of tension varies with the strength of the needs and affects the intensity of one's strivings (goal commitment). If the goal is unsatisfied, the tension remains and behavior related to the goal will persist (the Zeigarnik effect) until the goal is satisfied or given up. Goals have the property of "equifinality". That is, a goal does not dictate behavior, but rather an end state that could be arrived at by adopting a number of different instrumental behaviors (or means) which may all substitute for each other in reducing the tension.

I. 2. Goal concepts in the cognitive era.

With the beginning of the cognitive revolution in the mid 1960s, the interest in the concept of motivation waned and explicit social psychological theorizing about goals has

been rather scarce. By contrast, goal concepts have been present often in *cognitive* models of human action. Neisser (1967) concluded that a current intent or goal is a primary determinant of cognition and behavior: "In accounting for the course of thought and action, there has been repeated reference to the subject's motives and expectations….To know what the subject will think of next [requires] a detailed understanding of what he is trying to do and why." (p. 304-305). Newell, Shaw, & Simon's (1958) G*eneral problem solver model* discussed means-ends relationships and depicted a hierarchy of goals and sub-goals, and Miller, Galanter, & Pribram (1960) discussed the relation between goals and plans. In addition to such models which concentrated mainly on the *architecture* of goal-directed behavior, other theories such as Social Cognitive Theory (e.g. Bandura, 1997) and Goal Setting Theory (Locke & Latham (1990; 2002) attempted to analyze the *motivational properties* of goals such as value and expectancy of attainment and to determine the impact of such variables on the expenditure of effort toward goal pursuit.

Nonetheless, the various cognitive models had little to say about *what* kinds of goals people have, *how* goals and goal systems develop on a moment-to-moment basis and how they are integrated with other aspects of human behavior. According to Bargh (1990, p. 99) "typically, it is the *executive process* that selects the current goals and chooses among available alternative actions." But questions as to what or who constitutes this "executive process" remained largely unanswered. Neisser (1967) referred to this failure of different models of human action and cognition to specify what determines what particular goal will be in place at a particular point in time as the "problem of the executive". By including the "goal box" or the "executive process" only as an exogenous

variable in models of cognition and action in many analyses, the organism was portrayed as a spectator rather than as a participant, as if, "people only collect maps, but never go to trips" (Pervin, 1989).

I. 3. Motivation vs. cognition.

Unlike the attention that cognitive psychology accorded to goal-directed action and goal constructs, in social psychology motivation was often *contrasted* to cognition. Thus, for example, the dissonance vs. self-perception debate (Bem, 1972) pitted motivational (i. e. dissonance) versus cognitive (i. e., self-perception) explanations of attitude change phenomena. Similarly, motivational explanation of biased causal attributions in terms of ego-defensive tendencies (cf. Kelly, 1972) was contrasted with a purely cognitive explanation in terms of expectancies (Miller & Ross, 1975).

I. 4. The separatist program.

A different approach assumed that motivation and cognition fulfill *"separate"* functions in different information processing. Thus, in major social psychological models of persuasion (Petty & Cacioppo, 1986; Chen & Chaiken, 1999), judgment, or impression formation (Brewer, 1988; Fiske & Neuberg, 1990, Kruglanski & Webster, 1996), distinct functions were assigned to motivational and cognitive variables. From this perspective, different types or degrees of motivational involvement affect the extent and direction of ongoing information processing. For instance, high processing motivation is associated with extensive processing of message arguments whereas low processing motivation is associated with brief processing of "peripheral" or heuristic cues (Petty & Cacioppo, 1986; Chaiken & Chen, 1999).

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Beyond its separation from cognition, motivation has been often treated *statically* in social psychology research. In other words, social psychological theories assumed the presence of a given need or motive (e.g. the need for cognitive consistency) and addressed its consequences but they didn't dwell much on conditions for the appearance and disappearance of the motivational state. Motivation theories have taken as a central concern the role of specific human needs (Maslow, 1970; Deci & Ryan, 1985) and differences in goal-directed behavior and their consequences were explained in terms of specific behaviors that individuals set for themselves. Specifically, individuals were classified as if in a fixed motivational state with identifiable properties and differences in the specific content of that state (were expected to affect person's behavior (Gollwitzer & Moskowitz, 1996). Thus, individuals were considered to have either a high or a low need for closure (Kruglanski & Webster, 1996; Webster & Kruglanski, 1998), a high or a low need for cognition (Cacioppo & Petty, 1982), "learning" or "performance" goals (Dweck, 1991), goals with a positive vs. negative outcome focus (Higgins, Roney, Crowe, & Hymes, 1994), "intrinsic" (autonomy, competence) vs. extrinsic" (money) goals (Deci & Ryan, 1991), or "high-level" (abstract) goal vs. "low-level" concrete goals (Emmonos, 1991, 1996). These different types of goals were assumed to systematically impact various relevant phenomena including information processing, performance, creativity, and overall well-being and satisfaction (Gollwitzer & Moskowitz, 1996).

I. 5. *The New Look approach in motivation*

Having set a goal is just the first step toward goal attainment. Goal pursuit includes a manifold set of activities. Initiating goal-directed actions and bringing them successfully to their conclusions requires one to seize the opportunities to act (i. e. to find

appropriate means), ward off distractions, bypass barriers, compensate for failures and shortcomings, and negotiate conflicts. Often, it may be difficult to sustain a focused pursuit on a given goal. Our wishes, interests, and desires are rarely very steady or constant. Often they fluctuate from one moment to the next as we succumb to a variety of distractions, temptations, and digressions. Rather than relentlessly keeping to the task at hand we often daydream, ruminate, or get otherwise distracted and our shifting moods and emotional states often track our changing motivational conditions.

Recently, social psychologists realized that an insight into such motivational dynamics may be gained if we abandon the separateness assumption of the "motivation" versus "cognition" program. The last seventeen years of motivational research, dating back to John Bargh's Automotive chapter of 1990, were characterized by a fresh, cognitive look into motivation. The "New Look in Motivation" recognized that motivational constructs are cognitively represented. In a sense, the New Look in Motivation mirrored the New Look in Perception of the late 1940s and the 1950s. Whereas the New Look in Perception was about how cognition is colored by motivation (Bruner, 1951) the New Look in Motivation was about how motivation is colored by cognition, or, better yet, about *motivation as (a kind of) cognition*. Of greatest importance, the "New Look" highlights motivational *dynamism* and *flux* as persons *move* through their environments and react to them (Kruglanski & Kőpetz, in press (a)).

Central to the New Look approach in motivation is the notion that goal constitutes a *cognitive representation* of a desired endpoint, and that such a representation impacts evaluations, emotions, and behaviors (Fishbach & Ferguson, 2007). Aspects of this definition have been echoed in the goal literature throughout the past 20 years (e. g.

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Bargh, 1990; Carver & Scheier, 1981; Gollwitzer & Moskowitz, 1996; Sorrentino & Higgins, 1986). The definition of goals as knowledge structures (Kruglanski, 1996) implies that goal concepts are governed by the same principles that apply to other cognitive structures as well (that is, to categories, concepts, judgments, or opinions). According to this notion, just like other cognitive constructs goals can be activated, or primed by various stimuli (retrieval cues). For instance, semantic associates may activate a goal, (Chartrand & Bargh, 1996; Bargh et al., 2001), specific person concepts (e. g. mother, father, friend) who have a given goal *for an individual* may also activate it (Shah, 2003a, 2003b; Fitzsimons & Bargh, 2003). Priming by specific persons who have a given goal *for themselves* may activate it in others, thus producing a *goal contagion* (Aarts, Gollwitzer & Hassin, 2004). A means may activate the corresponding goal in a bottom up fashion (Berkowitz & LePage, 1967; Shah & Kruglanski, 2003). An *opportunity* to pursue a goal may activate it (Shah and Kruglanski, 2003).

Once they have been automatically activated, goals are automatically pursued. This was presumed possible because goals, just like other cognitive constructs, are cognitively associated with other constructs such as their corresponding means of attainment. Hence, the activation of goals is spread intra-systemically to their corresponding behavioral plans (Bargh, 1990; Aarts & Dijksterhuis, 2000; Aarts, Dijksterhuis, & De Vries, 2001; Kruglanski et al., 2002; Ferguson & Bargh, 2004) stirring individuals to action. Furthermore, similar to other cognitive constructs, goals too are constrained by limited attentional resources, such that the activation of a given goal may pull resources away from another goal (for a review see Fishbach & Ferguson, 2007; Kruglanski & Kőpetz, in press(a), (b)).

Much of the new research on goals (for discussion see Kruglanski & Kőpetz, in press(b)) explored the properties of goals by demonstrating that various cognitive processes (knowledge activation, spreading activation, unconscious activity) apply also to goal related phenomena. Typically, the *explicit* focus of that work was on implementing a given cognitive manipulation such as supraliminal or subliminal priming and looking at its effect on various goal related outcomes, such as action, performance, positive or negative affect engendered by goal progress or lack of progress respectively, etc. In that line of work, the goal related outcomes were often based on plausible intuitive assumptions rather than on systematic analysis. For instance, in research where a goal was primed and an activity was observed (e.g., Aarts & Dijksterhuis, 2000; Bargh et al., 2001; Chartrand and Bargh, 1996) the intuitive assumption was that goals automatically lead to associated activities. In research on emotional transfer (Fishbach et al., 2004) the assumption was that goals are invested with positive affect that may be transmitted to the means, and that is diffused and released once the goal in question is attained (Fergusson & Bargh, 2004).

I. 6. The Goal Systems theory.

Inspired by the New Look movement, goal-systems theory developed by Kruglanski, Shah and others (Kruglanski, et al. 2002) proposed a systematic analysis of the dynamic of goal-directed behavior. Rather that approaching goals in isolation, goal systems theory assumes that our wishes, interests and desires often fluctuate from one moment to the next affecting our thoughts and actions. Moreover, human lives are often lived in considerable "motivational business" in which different goals, sub-goals and means vie for the individuals' attention. From this perspective, the theory focuses on the

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behavior of goal systems defined as mental representations of motivational networks composed of interconnected goals and means. A possible goal system in depicted in Figure 1.

Motivational phenomena such as goal commitment, means choice, management of goal conflict are approached as a joint function of cognitive principles (that the goal systems share with other cognitive structures) as they apply to *unique motivational concepts* such as goals and means.
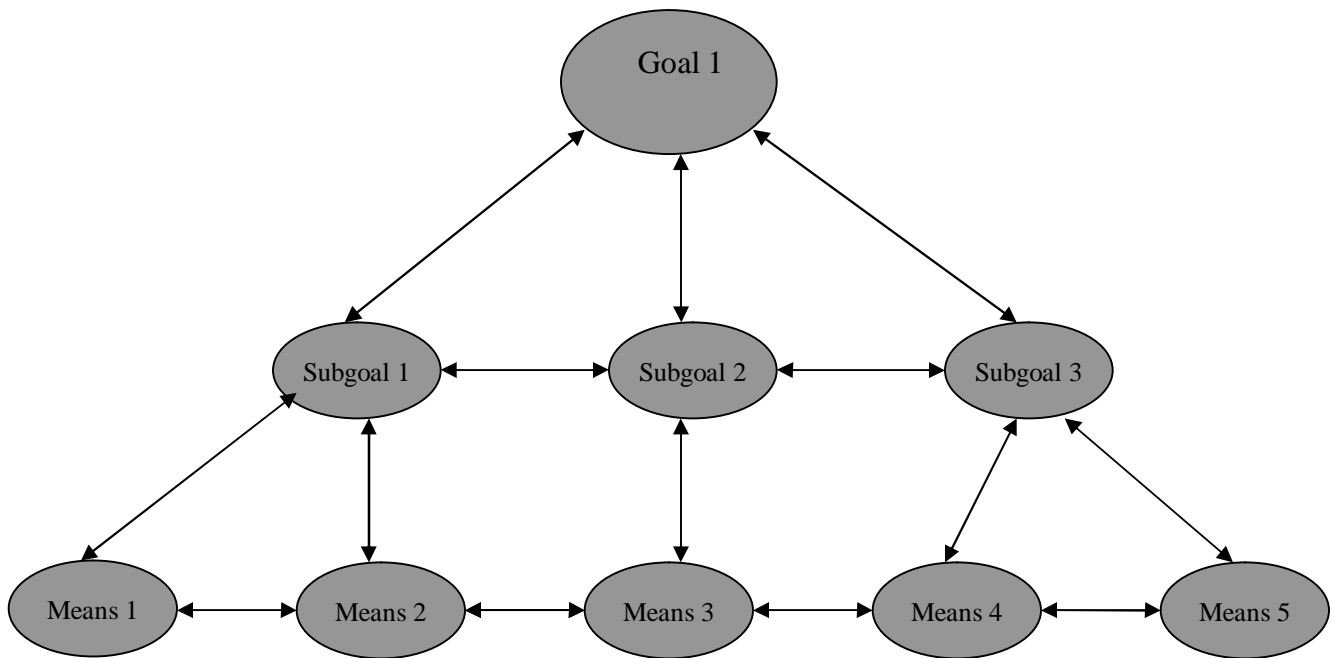
Figure 1. **A system of goals and means (Reproduced after Kruglanski et al., 2002)**

The theory recognizes that human action is goal-driven, in that it represents the striving to attain specific desirable objectives. Decision to pursue a goal involves considerations of goal value and its expectancy of attainment which define subjective utility (Atkinson, 1964). Subjective utility determines goal commitment or the degree to

which the individual is determined to pursue specific objectives which, in turn, may express themselves in the persistence of efforts toward goal attainment including the choice of appropriate means and the management of goal conflicts. Subjective utility considerations may also drive the choice of appropriate means. All else being equal, at any given moment, the means to be chosen are those which promise the greatest expectancy of attainment. Often, the means to be chosen are those means that in addition to a focal goal promise to attain additional active goals as well, hence being multifinal. The number of goals linked to a given means define the multifinality set captured by the notion of "many birds with one stone" (see Figure 2).
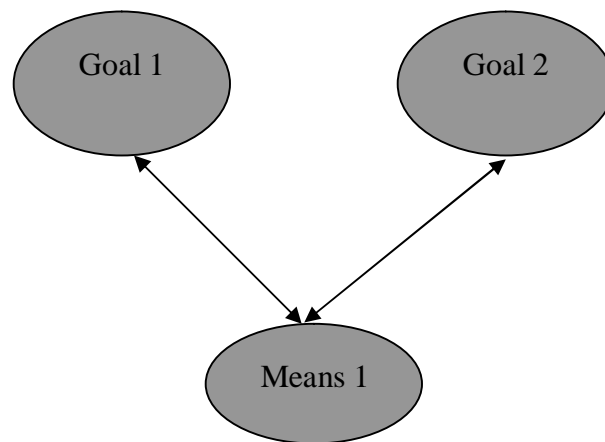
Figure 2 Multifinality configuration (Reproduced after Kruglanski et al., 2002)

Whereas goal pursuit has its own endogenous determinants related to considerations of expectancy and value, it is also determined by the exogenous cognitive conditions of a given goal system which affect the nature and values of theses endogenous factors. Such cognitive factors are structural and allocational. Thus, (1) goals like other mental representations are associatively linked to other constructs, such as their

means of attainment, and other goals and (2) such associative links can be facilitative or inhibitory; 3) goal pursuit is resource-dependent; the greater the investment of resources in the pursuit of a certain goal, the less resources would be available for alternative goals or means. For instance, the mere presence of "*Chocolatier*" magazine may facilitate the activation of the goal of "eating" but it may also remind people that they should go on a diet (Fishbach, Friedman, & Kruglanski, 2003). In such instances, successful goal pursuit may involve the inhibition of the eating temptation such that one can efficiently concentrate resources on the pursuit of the more committed goal of dieting.

The present work would like to consider how these goal systemic notions relate to the impact that additional goals may have on individual's ability of choosing effective means to the ongoing strivings.

II. Multiple goal pursuit and the notion of multifinality

II. 1. The pursuit of multiple goals and goal conflict.

     The possibility that goals are automatically activated by a variety of stimuli that people may naturally encounter, including semantic stimuli, objects, relationship partners, and strangers suggests that in typical, rich and complex social environments the coactivation of simultaneous goals seems inevitable. In addition, people may consciously choose to pursue several goals simultaneously (e. g. career and family). Indeed, psychologists have long acknowledged the idea of multiplicity in human action. Neisser (1967) observed that "almost all human activity, including human thinking, serves not one, but a multiplicity of motives at the same time" (p. 195). Similarly, Atkinson & Birch's (1970) theorizing on the dynamics of action, assume that at any given point many different action tendencies coexist. Such situations in which multiple desirable goals may be present at the same time have been traditionally approached in terms of goal conflict whose resolution required a choice. In the words of Emmons, King, & Sheldon (1993), "Implicit in self-regulated activity.....is conflict" (p. 528).

     The existence of conflicting desires or drives in individuals has been addressed in psychology beginning with William James' (1890) discussion of the battle between impulses and inhibitions and continuing through the work of Freud (1923/1962) in his classic treatment of the struggle between ego and id. Later research inspired by the behaviorist approach, also recognized the paramount role played by conflict as embodied in the work of Neal Miller (1944) on approach-avoidance gradients. He referred to the

situation where the individual is confronted with a choice between two equally desirable alternatives as an "*approach-approach*" competition. In his view, as soon as the response of approaching one goal is initiated, it produces effects which either increase their own strength or decreases that of competitors. In social psychology, Kurt Lewin is widely credited with first highlighting the effect of conflicting forces or tension systems on behavior (e. g. Lewin, 1951; see Ross & Nisbett, 1991). In this sense, Lewin talks about the need to exercise choice when the person is located between two positive or negative valences that are mutually exclusive. More recently, Emmons and King (1988) showed that conflicting goals tend to produce rumination rather than action, and in consequence, the person fails to make progress toward any of the conflicted objectives. Similarly, Van Hook and Higgins (1988) noted that self-regulatory difficulties often arise from internal conflicts between one's divergent standards which make difficult the assessment of progress toward one's goals.

II. 2. Goal conflict and the competition for limited resources.

The underlying assumption of the goal research outlined above is that simultaneously activated goals compete for limited motivational resources. According to this view, pursuit of a given goal inevitably pulls resources away from other pursuits. Consistent with this notion are findings indicating that effective goal-pursuit decreases as a function of fatigue, concurrent activity, negative affect, or immediate and prior efforts, all of which may considerably tax and deplete individual's cognitive resources (Baumeister, Bratslavsky, Muraven, & Tice, 1998; Muraven, Tice, & Baumeister, 1998). For instance, participants asked to control their emotional responses to an upsetting movie were subsequently less able to persist in holding a handgrip. Or, in another study,

participants who suppressed forbidden thoughts were subsequently less likely to persist in solving anagrams. Moreover, recent results indicate that acts of self-control whereby people protect their high important goals (e. g. dieting) from interference with low-important goals (e. g. indulging one's craving for a tasty but fattening piece of cake) require a certain amount of glucose to operate unimpaired. A single act of self-control causes glucose to drop below optimal levels, thereby impairing subsequent attempts at self-control (Gailliot, Baumeister et al., 2007).

Along these lines, it has been found in several studies (Shah and Kruglanski, 2002) that introducing an alternative goal undermines participants' commitment to a focal goal, hampers progress toward that goal, hinders the development of effective means for goal-pursuit, and dampens participants' emotional responses to positive and negative feedback about goal progress. In one of Shah and Kruglanski's (2002) studies, participants expected to perform two consecutive tasks, the first of which consisted of anagram solution. While working toward this focal goal participants were subliminally primed with the second task they expected to perform later (that operationally defined the "alternative" goal) or, with a control-phrase. Commitment to the focal goal was assessed through persistence on the first task, performance success, and extent of affective reactivity to success and failure feedback. These measures of commitment showed substantial decline in the alternative goal-priming (versus control) condition. In other words, the activation of alternative goals may pull away attentional resources from the focal goal which in turn may undermine commitment to such goal.

II. 3. Managing multiple goals

        Goal choice. Given the detrimental effects that the presence of alternative goals may have on the pursuit of a focal goal, the question is then how people deal with their multiple pursuits? Recent theorizing about multiple goal pursuit suggests that in the face of numerous competing pursuits a person needs to prioritize them and resolve goal conflict in order to ensure the successful attainment of as many goals as possible (Cantor & Langston, 1989; Carver, 2004; Emmonos & King, 1988; Higgins, 1997; Shah, 2005; Simon, 1967). One line of research has advanced the idea that when confronted with multiple concerns at the same time, people do not "*optimize*" their performance on any of them, but rather "*satisfice*" (Carver, 2004, p. 23; Simon, 1953) or do "a good enough job on each concern to deal with it satisfactorily" and then move along. Along these lines, Herbert Simon (1967) acknowledged that an entity that has many goals needs a way to rank them in order of importance and requires a mechanism for changing the rankings as necessary.

        In Simon's view, individuals act according to a hierarchy of goals whereby distinct goals may be queued and handled within individual time allocations. However, given the fact that the environment places important and sometimes severe time constraints, upon goal pursuit, one needs to respond to interruptions and imperative demands (e. g. hunger, fear, noticing motion) unrelated to the current goal. Moreover, even when not necessarily interrupted, human behavior needs to be responsive not to just one, but a multiplicity of goals. For instance, a speaker not only attends the content of what he is saying, but also responds to the feedback he gets from the facial expressions, postures and gestures of his listeners. While she is seeking to inform, she may also be

seeking to please, to impress, or to earn appreciation. Simon proposes that in such instances emotions are calls for reprioritization. He suggests that emotion arising with respect to an additional goal that may be activated outside of awareness eventually induces people to interrupt their current behavior and give the newly activated goal a higher priority. A similar emotional-based mechanism that allows people to shift from one current pursuit to another has been proposed by Carver (2003, 2004). He argues that given the fact that people have multiple concerns at the same time, positive emotion associated with goal pursuit may signal progress and may induce the tendency to coast (Carver & Scheier, 1998; Frijda, 1994) or to "pull back temporarily the resources devoted" to that goal (p. 22). Such tendency to coast facilitates the shift of attention and effort to other behavioral domains allowing one to maintain a satisfactory standing with regard to multiple goals and to be able to handle unforeseen demands and opportunities.

Kuhl (1983, 1984) suggested a different mechanism responsible for the management of multiple goals (for a recent review see Kuhl & Beckmann, 1994). He proposed that for a goal-directed action to occur, the current guiding, or focal, goal has to be *shielded* from competing goals (e. g. the goal of getting to class in time from the goal of making up the bed in the morning). He terms this shielding mechanism *action control* and differentiates possible control strategies involved in attention control, emotional control, environmental control, etc. Shah, Friedman and Kruglanski (2003) further investigated *goal shielding* and found that activation of a given focal goal results in an inhibition of alternative goals reflected in the slowing down of lexical decision times to such goals. For instance, when a goal (versus a control word) served as a prime this increased the lexical decision times to the alternative goals (versus control words)

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attesting to their inhibition. In Shah and Kruglanski's (2003) research the magnitude of such inhibition was positively related to participants' commitment to the focal goal they were currently pursuing.

Although the ability to inhibit competing alternatives to a focal goal confers clear self-regulatory advantages because it allows one to concentrate resources on the current pursuit and, hence, efficiently pursue one's goals, such mechanism may prove inefficient in those situations where the overall commitment to the currently activated goal is appreciably lower than commitment to alternative goals. This may be the case in some common situations wherein momentary allurements threaten to thwart the attainment of long-important goals. In such circumstances inhibiting the latter and succumbing to temptations may be counteradaptive. The opposite pattern would make much more self-regulatory sense—namely, the activation (rather than inhibition) of higher priority goals on confrontation of a temptation. Indeed, Fishbach et. al. (2003) showed that successful self-regulators may have learned to spontaneously activate (rather than inhibit) higher priority goals when confronted with temptations. In parallel, inhibitory links may develop between the representations of the goals and their pertinent temptations. Such asymmetric pattern of associations between short term motives (temptations) and the overriding goals with which they interfere allows participants to form self-control-related behavior intentions and to actually make behavioral choices consistent with their high-importance goals.

As suggested by research described above, when individuals simultaneously hold multiple goals, effective self-regulation implies *the need to exercise a choice* (1) either by prioritizing and pursuing a single goal to completion while inhibiting competing

alternatives or (2) by intermittently pursuing several potentially incongruent goals. What determines whether one strategy or the other is preferred? Recent research suggests that one relevant factor in this connection may be the person's interpretation of the initial action as congruent with one of the goals (Dhar & Simonson, 1999; Fishbach & Dhar, 2005; Fishbach, Dhar & Zhang, 2006). If such action is interpreted as a strong commitment toward the respective goal it motivates one to engage in similar complementary actions and to inhibit any competing goals. On the other hand, if an initial action toward a goal is perceived as progress toward that respective goal and it may determine the person to "relax" his or her efforts toward that goal and "switch" to another competing pursuits. In line with this theorizing, Fishbach and Dhar (2005) showed that when initial academic success was interpreted as indicating greater *commitment* to academic goals, students were subsequently interested in pursuing additional academic tasks and they were less interested in pursuing other leisure activities. However, when the same level of academic performance was interpreted as *progress* toward their academic goal, students' interest in pursuing additional academic tasks decreased significantly whereas their interests in leisure activities increased.

The quest for multifinal means. As depicted above, the presence of alternative goals often implies the need to *exercise goal choice*. Indeed, the inter-goal effects discussed above entailed a choice reflected in people pursuing one goal at a time while alternative goals are inhibited or postponed. However the possibility of giving up some of their goals (even if momentarily) may have negative consequences particularly when the conflicting goals represent enduring self-defining goals (Wicklund & Gollwitzer, 1982), personal strivings (Emmons, 1989), or life tasks (Cantor, 1994). Emmons and King

(1988) observed that conflict between personal strivings (i. e. power and intimacy goals) is often associated with poor well-being as reflected in negative affect as well as in physical symptomatology. Emmons (1996) suggests that such negative effects of conflict may be reversed through a creative integration of separate goal strivings. Similarly, Cantor and Fleeson (1991, 1994) suggest that perceived conflict between goals and its negative consequences may be reduced by recruiting one goal in the service of the other. For instance, one may "balance" the goal of doing well academically with other social goals by turning to close others for encouragements and reassurance when faced with obstacles and difficulties in the academic life.

Given the unpalatable possibility of having to give up on some of their goals, people may seek alternative strategies to deal with multiple goals. For instance, Dhar and his collaborators (Dhar & Simonson, 1999; Khan & Dhar, 2007) suggested that when confronted with two goals such as pleasure and good health, people may attempt to *balance* their choice of means to satisfy the goals (i. e. order a tasty but unhealthy appetizer followed by a healthy entrée). In a similar vein, research on the compromise effect (Simonson, 1989) demonstrated a general preference for choice alternatives that partially meet several goals at once rather than ones that fully meet a single goal. In line with this finding I propose that when confronted with multiple goals people may seek "multifinal" means believed to promote their concurrent attainment, and thus allow one to "have the cake and eat it too" (Kruglanski, Shah, Fishbach, Friedman, Chun, & Sleeth-Keppler, 2002). In other words, if in addition to the focal goal the individual is interested in pursuing other goals as well, the means to be chosen might often be the ones that promise to deliver the highest overall value taking into account these other interests

as well. It is important in this context to distinguish between "focal" goals that the individual is explicitly pursuing and "background" goals that are secondary and of which presence he/she may not be even consciously aware. My present purpose is to elucidate that nature of such a "multifinality quest" and to investigate its consequences and boundary conditions.

Multifinality concerns often affect people's everyday choices. Consider the purchase of a car. Typically, it represents a multidimensional decision process involving a number of considerations. Though one's primary purpose might be "transportation", other parameters (e.g., of price, design, performance, repair record, safety) typically enter the picture as well. Furthermore, it seems plausible that the more numerous one's requirements (e.g., goals a car purchase is intended to meet), the more difficult, and tortured the choice (i. e. the more "picky" and "demanding" one's behavior as a chooser). Simply, increasing the number of requirements depletes the set of satisfactory options, thus elevating the difficulty of the search (Bettman, Luce, & Payne, 1998; Dhar, 1996; Dhar & Simonson, 1999; Iyengar & Lepper, 2000; Luce, Bettman, & Payne, 1999; Tversky & Shafir, 1992). For instance, while all functioning cars provide transportation, somewhat fewer (though still quite a few) do so for an affordable price, fewer yet also please one's aesthetic tastes, fewer offer safety and a stellar repair record, etc.

As just depicted, multifinality concerns make a great deal of sense, and exemplify the simple rationality of maximizing the returns on one's investments, or increasing the "bang for one's buck." What makes this process psychologically interesting is the possibility that the multifinality quest may alter one's preferences for means to the same goal, depending on the currently activated goal alternatives. Because goals can be

activated by shifting environmental stimuli (Bargh, 1990; Bargh et al., 2001; Ferguson & Bargh, 2004; but see Fishbach & Ferguson, 2007; Kruglanski & Kőpetz, in press (a), (b) for reviews) this may effect an intriguing instability in the kinds and number of means deemed appropriate for pursuit of a current, focal, objective.

III. The present Theory

III. 1. Multifinality Quest and Means' Acceptability

The possibility that people's choices may be driven by multifinality constraints casts a novel light on an enigmatic finding by Nisbett and Wilson's (1977) (based on Wilson & Nisbett's (1978) research). In this study, passersby at a department store chose among four (and, unbeknownst to the participants, identical) pairs of nylon stockings, or four (identical) night gowns, the item of the highest quality. A strong position effect obtained such that the two rightward objects in the array were heavily over-chosen. Of interest, participants seemed entirely unaware of their bias. Instead, they justified their choices exclusively in terms of the focal goal of selecting the highest quality object in the array. Thus, whatever might have pushed their choices rightward seems to have operated outside these individuals' cognizance.

The notion of *multifinality* offers a possible insight into this puzzling phenomenon. From this perspective, beyond their assigned goal of *making a reasonable choice*, Wilson and Nisbett's (1978) participants, may have had another pressing goal, that of *reaching quick closure* and getting on with their shopping, after dutifully inspecting the entire array of stockings. Whereas the former, focal, goal was highly explicit and conscious, the latter goal may have been implicit, and to have operated in the "background", largely outside participants' awareness.

Given that the scanning habit within the American culture shows a distinct left to right directionality (Maass & Russo, 2003) *both goals* above (making a reasonable choice

and reaching quick closure) would have been satisfied to by the rightward objects in the array, the last ones to be inspected following an initial, obligatory, sweep. In present terminology then, the rightward objects would have been more multifinal than their preceding, left lying, alternatives. Thus, multifinality might have constituted a major reason why Wilson and Nisbett's (1978) participants ended up over-choosing the rightward objects and exhibiting the intriguing position effect of which they were, apparently, unaware.

Chun, Kruglanski, Sleeth-Keppler & Friedman (2005, Study 1) conceptually replicated Wilson and Nisbett's (1978) research with one modification. Whereas participants' "focal goal" was kept constant, their presumptive "background goal" of closure was systematically manipulated via time pressure (versus accuracy) instructions (Kruglanski & Freund, 1983). Consistent with the multifinality analysis, the rightward bias was replicated in the time-pressure condition and was eliminated in the accuracy condition. Chun et al's (2005) subsequent studies furnished additional evidence for multifinality quest using the background goals of identifying versus disidentifying with one's university and identifying versus disidentifying with the U.S. (Kruglanski & Kőpetz, in press (a), (b)).

III. 2. The core hypothesis: Mutifinality constraints effect

Given that a multifinality quest may take place, it is of interest to consider what effect this may have on goal pursuit. The major notion explored in the present research is that a multifinality consideration would narrow the set of means to a focal goal by inducing a preference for multifinal means, that is, means assumed to be instrumental also to the pursuit of alternative objectives. Such multifinal means are likely to constitute

a subset of the total number of means to the focal goal that one could envisage (see

Figure 3). Restricting one's attention to those particular means should thus reduce the

number of means to the focal goal that one would find acceptable. This implies that the

number and kind of means to a given focal goal may change significantly as a

consequence of events that happened to activate in the individual's mind some alternative

pressing objectives. I label this the *multifnality constraints effect*, and investigate it

empirically in studies described in what follows.
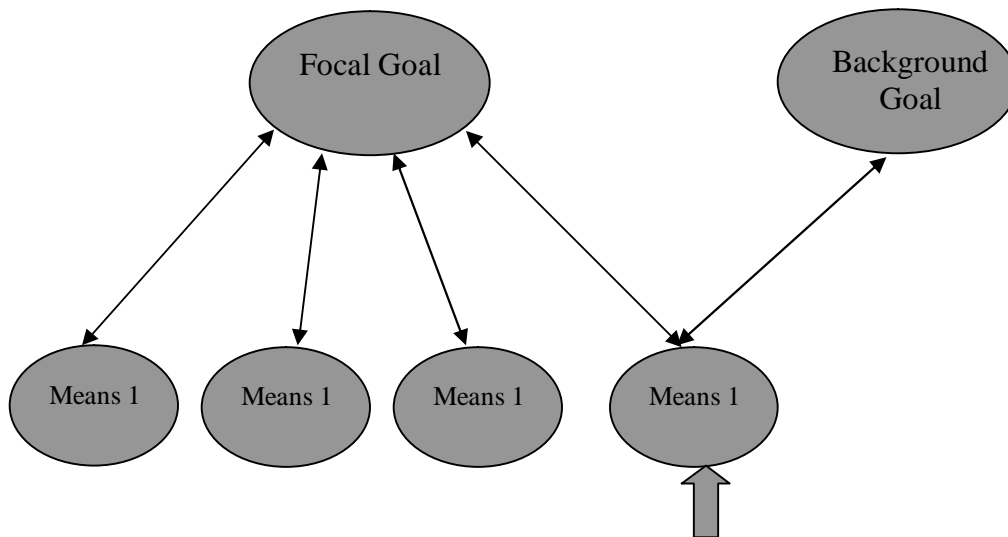

Figure 3 The multifinality constraints effect

III. 3 The boundary conditions of the multifinality constraints effect

     Feasibility of generating multifinal means. The multifinality constraints effect

may be subject to two boundary conditions. One relates to *feasibility of generating*

multifinal means given the nature of the relationship between the focal and the alternative

goals. Some focal and alternative goals may appear to share numerous common means. This should increase the feasibility of identifying multifinal means and reduce the extent to which the multifinality quest would occasion a reduction in the set of means to the focal goal. For instance, whereas one might find it *easy* to think of multiple ways to attain simultaneously the goals of "loosing weight" and "having a good figure" (i.e. "choosing a balanced diet", "exercising regularly"), it may be rather difficult to envisage a way to "do well in school" and " be a world class athlete" at the same time.

Foregoing considerations suggest a curvilinear relation between *perceived feasibility* of finding multifinal means and the degree to which alternative goals would constrain the size of the set of means to the focal goal (depicted in Figure 4). Where feasibility of finding multifinal means is either very high or very low (as compared to it being intermediate) constraints should be minimal: When feasibility is high, finding multifinal means should be easy, necessitating no appreciable reduction in the number of means to the focal goal. On other hand, when feasibility is very low individuals may give up on the very attempts at finding multifinal means. Instead, they may opt for exercising goal-choice by inhibiting the alternative goal and limiting their concerns to the focal goal at hand. In light of the foregoing considerations, the multifinality constraints effect should be more pronounced in an intermediate feasibility condition than in the very high or very low feasibility conditions. The two latter conditions aren't similar in all respects, however, as only in the low (but not in the high) feasibility condition should absence of the multifinality constraints effect be accompanied by goal-choice manifested, e.g. by an inhibition of the alternative goal. Moreover, if the forgoing effects are driven by a quest for multifinality, instrumentality of the means with regard to both goals should be high in

the high and intermediate feasibility conditions, but not in the low feasibility condition

where the means should be instrumental to the focal but not the background goal (see

Figure 4).
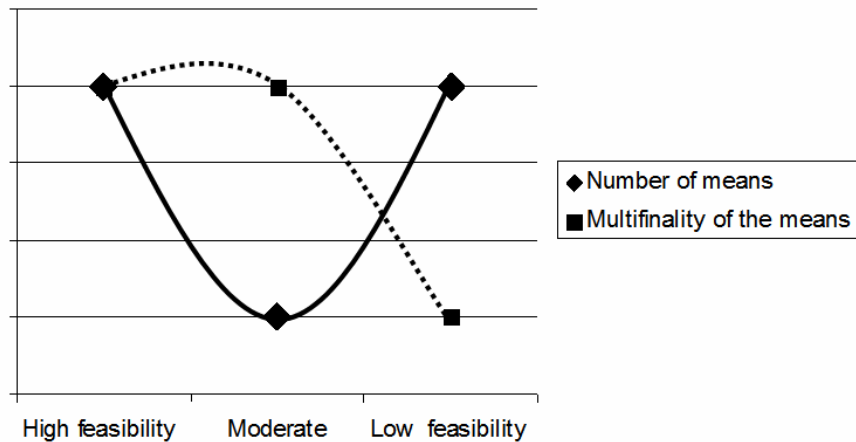
Figure 4 The relationship between multifinality constraints effect and the number and instrumentality of the means

Commitment to the focal goal. The second boundary condition on the multifinality

constraint effect may have to do with the degree of *commitment to the focal goal*

(Brunstein & Gollwitzer, 1996; Emmons, 1986; Cantor & Kihlstrom, 1987; Oettingen,

Pak, & Schnetter, 2001). Goal commitment has been conceived in terms of a strong sense

of determination, the willingness to invest effort, impatient striving (tenacity) toward goal

attainment (Hollenbeck & Klein, 1987; Novacek & Lazarus, 1990; Brunstein, 1993).

According to Locke and Latham (2002; p. 707), "two key factors facilitating goal

commitment are (a) factors that make goal attainment important to people, including the

importance of the outcomes they expect as a results of working to attain a goal, and (b)

their belief that they can attain the goal." According to this conceptualization several

indicators of goal commitment have been commonly used in the literature. Specifically,

Oettingen et al. (2001) assessed participants' level of goal commitment based on the extent to which participants formulated specific plans to attain the goal, took on responsibility and felt energized as well as through the immediacy of initiating action toward the goal, task persistence and actual performance. Similarly, Shah et al. (2003) approached commitment in terms of goal importance and tenacity of goal pursuit as reflected in task persistence. They demonstrated that increased commitment to the focal goal may produce its shielding via an inhibition of the alternate goals. Such inhibition should reduce the degree to which the alternative goals would have impact and constrain the means to the focal goal. Consistent with previous research, in the present work, I assume that increased commitment to the focal goal defined as determination or willingness to pursue that specific goal should liberate one from taking the alternative goals into account, hence removing the necessity to search for multifinal means, and allowing a full suite of means to the focal goal to be judged as acceptable.

In summary, I have postulated that the simultaneous presence of several goals may induce a quest for multifinal means affording the joint pursuit of the individual's co-active objectives. Multifinal means typically constitute a subset of the full array of means to a focal goal one might consider. Accordingly, activating additional goals should narrow the set of acceptable means to a focal objective. Moreover, the quest for "multifinal" means should constrain the type of acceptable "focal" means to ones that benefit the active alternative goals as well. This effect should be especially strong when the alternative and the focal goals are assumed to have only a few (but not many, or no) means in common. Finally, because increasing commitment to the focal goal may inhibit the alternative goals (Shah, Friedman & Kruglanski, 2003) it should relax their

"multifinality" constraints allowing the set of means to the focal goal to maintain its

unrestricted size.

The present research

I explored these notions in three separate studies. Study 1 constituted a

preliminary investigation designed to indicate whether a subtle reminder of goal-

alternatives would narrow the focal set of means for a current goal (of "having lunch") to

means that would save time and hence allow those alternatives to be pursued. Study 2

explored the notion that *restriction* in the number of acceptable means would be reduced

if the focal and alternative goals were perceived as potentially served by the same

(multifinal) means. Study 3 manipulated commitment to the focal goal (of "eating") and

investigated the hypothesis that this would inhibit the alternative goal (of "healthy diet"),

and hence relax its multifinality constraints, which should increase the set-size of

activities seen as acceptable means to the focal goal.

Study 1

Study 1 constituted a preliminary investigation designed to test the hypothesis that

activation of alternative goals would reduce the number of means considered as

acceptable for pursuit of a given focal goal. As argued earlier, the notion of mutifinality

quest implies such a reduction, based on the rationale that only a subset of otherwise

acceptable means would satisfy the multifinality constraints imposed by the alternative

goals.

Method

   Participants. Thirty eight University of Maryland students were approached at the Student Union in College Park during the lunch hour and were asked to fill out a survey on *"Students' eating habits."* Because women are typically more concerned with weight and dieting than men (Rozin, Bauer, & Catanese, 2003) and are more likely than men to be dieters or "restrained eaters" (Hawkins, Turell, and Jackson 1983; Ferraro, Shiv, & Bettman, 2005) I decided to restrict the sample to male participants. I reasoned that female participants may have chronic diet-related concerns (goals) that may override the importance of many of their daily activities and, therefore, drive the selection of foods despite the presence of other active goals. All the participants were volunteers and unsurprisingly, they all reported the goal of getting lunch as reason for being at the Student Union at that particular time. Accordingly, I identified 'getting lunch' as participants' focal goal.

   Food pre-testing. I conducted an extensive pre-testing of students' food preferences and the availability of such foods at the campus food court in order to identify foods that are highly desirable and readily available for students. Specifically, I asked forty-nine University of Maryland students, during lunch time (1PM-2PM), to list the foods they wanted for lunch and to rate how easily (1 = not easily at all; 9 = very easily) and how quickly (1 = not quickly at all; 9 = very quickly) they could get them at the food court in the Student Union. In response, participants listed 28 distinct food categories (e.g., pizza, pasta, salad, sushi, pancakes, etc.). Because the ratings of ease and quickness were highly correlated for each of the foods (*rs* ranging from .73 to .94, *p* < .05) I combined the two measures for each item. I then selected the 10 foods that scored

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the highest on the easiness/quickness scale (above 5 on the 1 to 9 scale) to represent the *"easy to get"* foods and the 10 foods that scored the lowest (below 3.5 on the 1 to 9 scale) to represent the *"hard to get"* foods. The list of foods is presented in appendix A.

Procedure. The study employed a 2 (goals: completed vs. uncompleted) × 2 (foods: easy vs. hard to get) mixed design, with goals varying between subjects and foods varying within subjects. I activated participants' alternative goals by asking them in one condition to list three activities they had planned for the rest of that day. This operationally defined the *uncompleted goals* condition. In the *completed goals* condition, participants were asked to list three activities that they had already accomplished that day. I assumed that the latter goals would have lost their driving potential, or in Lewinian terms, would have had their "tension-system" drained. Participants in both conditions listed similar activities such as "going to class/had a class" "exercising in the gym/went to the gym," "washing my car/drove to school" "studying for a quiz/went to the library." Participants were then asked to choose the foods they desired for lunch from a list of 20 foods. These foods were pre-tested such that 10 of them were generally readily available at the food court where I ran the study (e. g. Chinese food, tacos, fries) whereas the remaining 10 were foods considered to be unavailable at the food court, though available at other campus locations (e.g., salmon, macaroni and cheese, crab cakes). I assumed that "easy to get" foods are multifinal in that choosing them will help participants to fulfill their focal goal (of having lunch) and also to save time for alternative goals they had planned for the day.

Results and Discussion

The number of foods each participant selected as desirable was analyzed as a function of goals (completed vs. uncompleted goals) and type of foods (easy to get vs. hard to get foods). An ANOVA of this variable yielded a significant main effect of goals ($F(1, 35) = 8.75$, $p < 0.01$). Participants who were reminded of their uncompleted goals selected fewer foods (means) than their counterparts who were reminded of their already completed goals. Moreover, as attested by the significant interaction effect between goals and food type (($F(1, 35) = 5.15$, $p < .05$)), participants in the *uncompleted goals* condition were also more selective. Specifically, they chose a higher number of easy vs. hard to get foods ($M = 3.57$ vs. $M = 1.57$, $t(18) = 3.77$, $p < .01$). By contrast, participants in the *completed goals* condition in did not show a significant preference for easy to get foods ($M = 4.44$ vs. $M = 4.16$, $t < 1$) (see Figure 5).
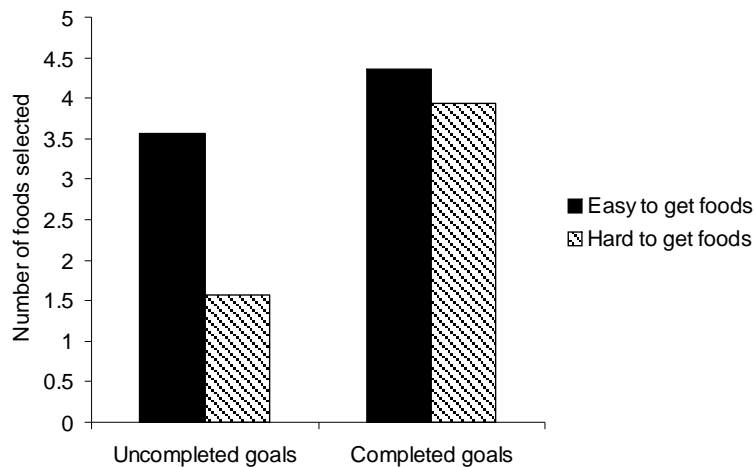

Figure 5 Number of "easy to get foods" vs. "hard to get foods" selected as means to the focal goal of "having lunch" as a function of alternative goals prime (Study 1)

Results of Study 1 support the basic prediction that the presence of alternative goals restricts the set of acceptable means for a focal goal to multifinal means that also

allow the pursuit of other active goals: Participants whose focal goal was to get lunch, showed a interest in fewer foods when they were reminded of other activities they had planned for the day than when they were reminded about activities they had already accomplished that day. Furthermore, when participants thought about their uncompleted (vs. completed) goals, participants showed a stronger preference for "easy" to get foods than for "hard" to get foods. The latter preference seems to reflect a search for a multifinal solution that would enable participants to attain their focal goal (that is, to have lunch) while leaving time also for alternative goals they intended to accomplish.

As participants were assigned randomly to the completed and uncompleted goals conditions, they likely had a similar number of future goals for the day. Objectively then, participants in both conditions should have been equally "busy." The difference between them resided in the fact that in the uncompleted (but not in the completed) condition participants had their impending goals activated. This presumably instigated participants' quest for multifinal means, producing the *multifinality constraint effect*.

In general, the multifinality constraint effect may serve an important self-regulatory function as it assures a better overall outcome (a bigger "bang for one's (investment) buck" in which neither goal alternative is abandoned. However, its appearance is subject may be subject to a number of boundary conditions. One such condition pertains to *feasibility* of identifying multifinal means for goals that happen to be active at the time. The next study was designed to investigate this particular moderator of the multifinality constraint effect.

Study 2

This study investigates the *feasibility* of finding multifinal means as a possible boundary condition for the multifinality constraint effect. Up to a point, feasibility of finding multifinal means should be inversely related to the multifinality constraints effect: The easier it should be to find multifinal means, the lesser should be the reduction in the number of focal means occasioned by presence of the alternative goal. In other words, as one moves from the high to intermediate feasibility (of finding common means) the relation between feasibility and the multifinality constraint effect should be *negative*.

As reasoned earlier, however, if the focal and the alternative goal appeared to share *no* common means whatsoever, the individual might view the multifinality quest as futile. In such a circumstance, instead of attempting to identify common means the individual might opt to exercise *goal choice* by inhibiting the alternative goal, and directing one's exclusive attention to the focal goal (Shah, Friedman & Kruglanski, 2003). Such a process should liberate the individual from the impact of the alternative goal, eliminating the multifinality constraint effect. In other words, in the segment of the feasibility continuum ranging from the *somewhat feasible* to the *completely unfeasible*, multifinality constraint effect should vary *positively* with feasibility. Thus, the number of acceptable means to the focal goal should be less in the somewhat feasible condition, when the focal and alternative goals are seen as somewhat related, than in the completely unfeasible condition. In summary then, the relation between feasibility/goal relatedness and the multifinality constraint effect should be curvilinear exhibiting a negative relation

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between feasibility/relatedness up to a point beyond which this relation should become positive.

In the present study I manipulated the feasibility of finding focal means by subliminally priming an alternative goal that varied in the number of means it shared with the focal goal. In the *high feasibility* condition this number was high, in the *moderate feasibility* condition it was intermediate and in the *low feasibility* condition it was low. I subsequently assessed the number of means (activities) that participants chose with regard to the focal goal. I also examined the possibility that where the feasibility of finding multifinal means is low a goal choice will take place, whereby people would inhibit the alternative goal. To test this hypothesis I measured the level of activation of the alternative goal.

Method

Pre-testing the stimulus materials. I first conducted a pre-test in order to identify alternative goals that were commonly pursued by a majority of students at the University of Maryland and that varied in the degree to which they shared means with the goal of "being healthy" (that I subsequently defined for participants as the focal goal). To this end, I asked 40 students whether "being healthy" was a goal that they were actively trying to attain and how important this goal was for them. Participants were then asked to list three other goals that they were planning to accomplish in the near future. Participants were specifically instructed to list one goal that shared a lot of common means with the focal goal of being healthy, another goal that shared only a few common means with the focal goal and a third goal that shared no common means with the focal goal. Finally, I

asked our participants to list all the activities one can engage in, in order to maintain good health (i.e., defined as means to the focal goal).

A majority of the participants listed "being in shape" as a goal that shared many means with "being healthy", "doing well in school" as a goal which shared few means with "being healthy" and "drinking alcohol" as a goal that shared no means with the health goal. The participants also generated 30 activities as means to the goal of being healthy including "to avoid drugs," "to stay focused," "to go to the gym," "to sleep well," " to eat well," etc. (see appendix B). A separate group of thirty participants evaluated the instrumentality of these means (activities) with regard to each of the four goals. This was accomplished on a 7-point scale ranging from 1 = "not instrumental at all" to 7 = "very instrumental". I then looked at the number of means whose perceived instrumentality fell above the midpoint of the scale. Not surprisingly, all the means were evaluated as relatively useful with regard to the goal of being healthy, exceeding the midpoint of the scale ($M = 5.13$). Twenty-nine of the thirty means generated were evaluated as also instrumental to the goal of "being in shape" ($M = 5.00$), whereas only twenty means were evaluated as instrumental to the goal of "doing well in school" ($M = 4.90$). Unsurprisingly, none of the means generated with respect to the goal of being healthy was perceived as instrumental to the goal of "drinking alcohol" ($M = 2.90$). As instructed then, the high feasibility goal that participants listed ("being in shape") appeared to share a high number of means with the focal goal, the intermediate feasibility goal ("doing well in school") shared a lower number of common means with the focal goal, and the low feasibility goal ("drinking alcohol") shared no common means with the focal goal.

Participants. One hundred four University of Maryland students, 33 males and 71 females participated in this study in exchange for course credit. Gender did not yield any significant results and it will be, therefore, omitted from further discussion.

Procedure. Based on the exploratory findings presented above, in the present study I first introduced the focal goal of "being healthy. To this end, participants were asked to rate on a 7-point scale the importance of "being healthy" for themselves and for others (1 = "not important at all" to 7 = "very important") and the extent to which they were actively engaged in the pursuit of this goal (1 = "a lot" to 7 = "not at all"). I then introduced the independent variable, the *feasibility* of finding multifinal means, by subliminally priming the alternative goal in three experimental conditions. In the *high feasibility* condition, the prime consisted of "being in shape," in the *moderate feasibility* condition, the prime consisted of "doing well in school," and in the *low feasibility* condition the prime consisted of "drinking alcohol." I also included a control condition in which no alternative goal was primed. I assumed that this condition would yield a baseline number of means that participants may generate to the focal goal.

While being primed with the alternative goal, the participants were presented with the list of 30 activities generated during the pre-test as means to the focal goal of "being healthy" and were asked to select those activities in which they were currently engaged and/or they were planning to engage in the near future. The number of activities selected defined the dependent variable. The priming of the alternative goal and the choice of the means with regard to the focal goal was accomplished in a modified lexical decision task (see Shah et al., 2003 for a similar procedure). Specifically, rather than requiring the participants to judge whether a target stimulus was a word as in a typical

lexical decision task, I asked them to judge whether the target stimulus represented an activity that participants were currently pursuing or planning to pursue in the near future. Each target was preceded by a subliminal prime. There were thirty primes consisting either of words representing the alternative goal in each of the three experimental conditions or of neutral words in the control condition. For instance, I primed "shape," "figure," and "exercise" for the alternative goal of "being in shape;" "school" "grades," and "exam," for "doing well in school;" and "drink," "alcohol," and "party," for "alcohol." In the control condition, the primes included neutral words such as "table" and "chair. The list of the words used to prime the alternative goal in each condition is presented in appendix C. I ensured that the primed words were relatively equal in length and frequency in the active vocabulary The targets consisted of the thirty activities generated as means toward the focal goal of drinking "being healthy" during the pre-test. All the activities were phrased in one to four words such as "stay focused," "sleep well," "eat balanced," "be self-disciplined," etc.

The prime word appeared in white at the center of the black screen for 40ms and was immediately forward and backward masked to ensure that it did not reach the threshold of conscious awareness (Bargh & Chartrand, 2000). After 700ms the mask was in turn replaced by the target representing an activity (a means) and participants were instructed to press "Z" if they were not currently pursuing/planning to pursue the activity or "/" if they were currently pursuing/planning to pursue that activity. The 740 ms interval between the prime and target onsets defines the stimulus onset asynchrony (SOA) (Bargh & Chartrand, 2000; Neely, 1977).

I base the procedure on the notion that goal-relevant knowledge should be more accessible upon the activation of a particular goal (Bruner & Postman, 1948; Aarts, Dijksterhuis, & De Vries, 2001; Ferguson & Bargh, 2004; Ferguson, Hassin, & Bargh, 2007; Sherman, Rose, Koch, Presson, & Chassin, 2003). As Ferguson et al. (2007) noted, "the current goals of a perceiver provide limitations and constraints on the types of knowledge accessible in the memory and this drives perceiver's attention toward certain elements within the environment" (p. 22). I therefore assumed that activation of the focal and the alternative goal will render those means perceived instrumental to these goals more accessible, and hence more likely to be chosen by the participants as activities they are currently engaged in.

Before they engaged in a second lexical decision task designed to measure the activation of the alternative goal, participants completed a filler task. They were asked to rate the extent to which they perceived the goal of "being healthy" to be related to each of the three alternative goals, "being in shape", "doing well in school" and "drinking alcohol."

Finally, participants completed a second lexical decision task to assess the accessibility of the alternative goal after being primed with the focal goal or with neutral words (for a similar procedure see Shah & Kruglanki, 2002; Shah et al., 2003). The procedure was a typical sequential priming procedure widely used to asses the impact that activation of a specific construct may have on other related constructs (Bargh & Chartrand, 2000; Fazio, 1990). At the beginning of each trial, a fixation point ("X") appeared in the center of the screen for 2 seconds to indicate to participants where to focus their attention. The fixation point was then replaced by a prime word for 50 ms,

backward and forward masked. The mask was in turn replaced by a target word and participants were instructed to decide as quickly as possible whether the targets represented words or non-words. Again, the stimulus onset asynchrony was 750ms. The relatively long prime duration and SOA were intended to increase the power to detect a priming effect by allowing both increased processing time for the prime and increased time for inhibitory processes to come into play (for a similar discussion see Fishbach et al., 2003).

The entire task consisted of 120 trials. In 45 of the trials participants were primed with the focal goal through words such as "health", "fit", "well", etc. and responded to targets representing their alternative goal (e.g., "school") as well as the alternative goals corresponding to the other two conditions (e.g., "alcohol", "shape"). Because of the possibility that words representing the alternative goal of "drinking alcohol" may elicit a "perceptual defense" kind of process (Bruner, 1951) that would slow participants' reaction times I also had the participants respond to the alternative goals after being primed with a neutral word rather than the focal goal in 45 trials. The remaining 30 trials consisted of neutral primes and neutral and non-word targets to assess participants' baseline reaction time.

Finally, I administered a modified funnel-type debriefing procedure (Bargh & Chartrand, 2000) to ascertain that the priming procedures were indeed subliminal. Although some of the participants reported to have seen words flashing during the priming procedures none of them reported being able to actually identify these words.

Results and Discussion

Reduction in the number of means. A one-way ANOVA which analyzed the effect of feasibility on the number of means/activities that participants selected yielded a significant main effect,($F(3, 100) = 20.33, p < .01$) . As revealed by the predicted contrasts of interest, participants in the *moderate feasibility condition* selected fewer means/activities ($M = 18.45$) than did participants in the *high feasibility* condition ($M = 22.21$), $t(100) = 6.63, p < .001$. However, the number of means selected in the *high feasibility* condition did not significantly differ from the number of means selected in the control *no alternative goal* condition ($M = 22.46$), $t < 1$. Moreover, the number of means selected by the participants in the *low feasibility* condition ($M = 21.46$) did not significantly differ from the number of means selected in the control, *no alternative goal,* condition, $t(100) = 1.7, p = .08$. These results are summarized in figure 6.

Multifinality of the Means. So far, the results indicate that a *number* of selected means to the focal goal depends on the relationship between the focal and the alternative goals. To explore the possibility that such selection reflects a multifinality quest, I next looked at perceived instrumentality of the selected means with regard to the alternative goal. Based on the pre-test evaluation of perceived instrumentality of the means/activities with respect to the alternative goal, for each participant, I first computed an average score representing perceived instrumentality of the selected means with regard to the corresponding alternative goal. An one-way ANOVA revealed an overall significant effect of feasibility on perceived instrumentality of the means with regard to the alternative goal ($F(1, 75) = 42.54, p < .01$). Interestingly, although I observed a reduction in the *number* of means with regard to the focal goal of "being health" when an

alternative goal was perceived to share few means in common (in the *intermediate feasibility* condition) vs. many means in common with this goal (in the *high feasibility* condition), there was no significant difference in the perceived instrumentality of the means with regard to the alternative goal between these two conditions ($M = 4.55$ vs. $M = 4.75$, $t(75) = 1.63$, $p > .05$). This finding is consistent with the notion that the reduction in the number of means selected to the focal goal was motivated by a multifinality quest of finding means that are instrumental with respect to *both* the focal and the alternative goals.

Also consistent with this interpretation was the finding of a significant difference between perceived instrumentality to the alternative goals of means selected by participants in the *low feasibility* condition. Specifically, though the number of selected means to the focal goal was greater in the *low feasibility* versus *moderate feasibility* conditions, the instrumentality of the means to the alternative goal was significantly greater in the latter versus the former condition ($M = 4.55$ vs. $M = 3.73$, $t(75) = 6.81$, $p < .01$). This finding suggests that where the feasibility of finding common means is very low, participants give up on the multifinality quest and select focal means without regard to the alternative goal being primed.
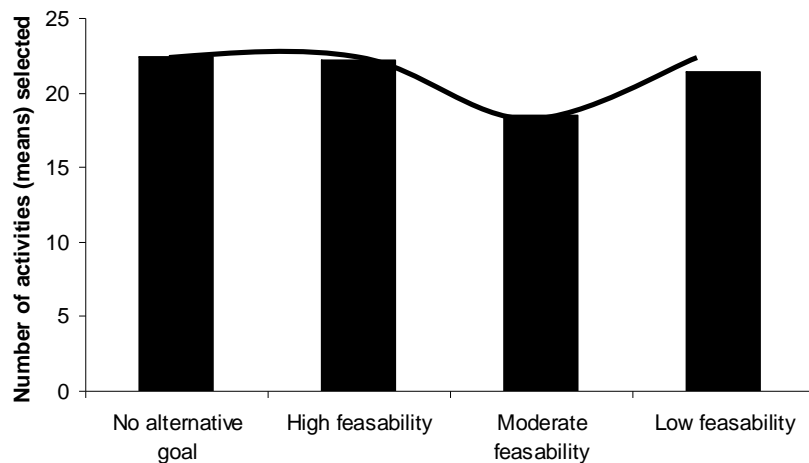
Figure 6 Number of activities (means) selected with regard to the focal goal of "being healthy" as a function of feasibility of finding multifinal means (Study 2)

Intergoal inhibition. I additionally hypothesized that where the feasibility of finding common means is low, participants may execute a goal choice by inhibiting the alternative goal altogether. To explore this possibility, I calculated an average of participants' lexical decision times to words related to their alternative goal after being primed with the focal goal. Because the latency of incorrect responses would be difficult to interpret in terms of inhibitory strength, only correct responses were used in the analyses (Bargh, Chaicken, Govender, & Pratto, 1992; Fazio, 1990). All individual reaction times were first transformed using a natural log transformation to lessen the influence of outliers (Fazio, 1990).

To control for the general accessibility of the alternative goals I averaged participants' reaction times to their alternative goal after being primed with neutral words. I assumed that slower reaction times to the alternative goal after being primed with the focal goal vs. a neutral prime would indicate that the focal goal resulted in an inhibition of the alternative goal (see. Shah et al., 2002 for a similar procedure). Finally,

to get a baseline reaction time I calculated participants' average reaction times to neutral words, non-words and goals primed in the alternative experimental conditions. I then performed a repeated measures analysis of variance on participants' average reaction time to the alternative goal when the focal goal served as prime vs. when a neutral word served as prime while simultaneously controlling for (co-varying out) their baseline reaction time.

As illustrated by the untransformed latencies presented in figure 7, an inhibition of the alternative goal appears to have occurred, but only when the alternative goal ("drinking alcohol") was perceived to share no means with the focal goal of "being healthy" ($F(2,72) = 7.76$, $p = .001$).

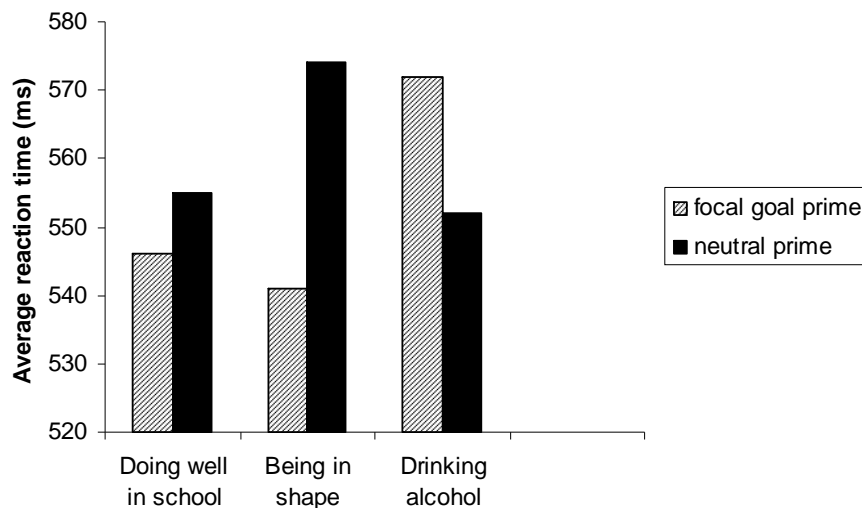
Figure 7 Lexical decision time for alternative goal targets when primed with the focal goal or with a neutral word (Study 2)

Specifically, after controlling for the baseline reaction time to non-words, neutral words and other goals, participants in this condition responded significantly more slowly to the alternative goal after being primed with the focal goal than after being primed with

a neutral prime (572ms. vs. 552ms, $F(1, 22) = 4.28$, $p = .05$). By contrast, participants in the other two conditions did not show such inhibitory effect. Indeed, participants in the "doing well in school" and "being in shape" conditions responded as fast to their alternative goal after being primed with the focal goal as they did after being primed with a neutral prime (546ms vs. 555ms and 541ms. vs. 574, $F < 1$).

In summary, findings of Study 2 replicate and extend those of Study 1. In the present study too, introduction of an alternative goal reduced the number of means to the focal goal. Of particular interest, the extent of such reduction depended on the nature of perceived relationship between the focal and the background goals: When these two goals were perceived to share numerous common means, no restriction in the number of "focal" means was observed. By contrast, when the two goals shared fewer (though still some) means in common, substantial reduction in the number of selected "focal" means took place such that the means selected with regard to the focal goal of "being healthy" were those activities that appeared to serve the background goal of "doing well in school" as well. Finally, when a background goal essentially shared no means in common with the focal goal of "being healthy" (i.e., "drinking alcohol"), participants were less selective with regard to the means/activities that they chose.

In this latter condition, hardly any restriction was observed in the *number* of means selected with regard to the focal goal. Moreover, the selected means in this condition were not instrumental with regard to the alternative goal of "drinking alcohol", and indeed this goal appears to have been inhibited (Shah, Friedman, & Kruglanski, 2003)[1].

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[1] Although the results are consistent with my hypothesis a pertinent question may be raised with regard to weather effects found in Study 2 could have been obtained as a result of a difference in goal generality or

Generally speaking, results of Studies 1 and 2 are consistent with the notion that a quest for multifinality may take place where in addition to the focal goal people are also attempting to pursue a background goal. Study 2 has also indicated that one boundary condition of such a quest has to do with its feasibility. Specifically, where the feasibility of finding multifinal means is very high, no restriction in the number of "focal" means is taking place, nor does such restriction occur where the feasibility of finding multifinal means is very low. Thus, a curvilinear relation appears to exist between feasibility and the *multifinality constraint effect* of reduction in the means (generated or selected) for pursuit of a given focal goal.

The final study aimed to explore a second boundary condition of the multifinality constraint effect, namely, the degree of commitment to the focal goal. I assume that increased commitment to the focal goal should reduce the impact of alternative goals on focal means' generation, and that it should do so through inhibition of the alternative goals (Shah, Friedman & Kruglanski, 2003).

Study 3

Whereas the two former studies kept the focal goal constant and manipulated the presence (and/or type) of the alternative goal, the present study held the alternative goal

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abstractness. Although our sample is based on a college population which is known for being particularly interested in the procurement and consumption of alcohol, the goals of "doing well in school" and "being in shape" seem to be more general and abstract than the goal of "drinking alcohol". The later could be conceived as a means toward a more general goal of "getting high" rather than a goal in itself. In such case, one can argue that the reduction in the number of means in the low feasibility condition may have been driven by an absence of an alternative goal with equal driving power as the alternative goals in the other two conditions rather than by the inhibition of the alternative goal induced by the difficulty to find multifinal means. Such considerations require further empirical investigation.

(of keeping a healthy diet) constant and varied commitment to the focal goal of "eating" by varying the degree of hunger. Participants' level of hunger (i.e., desire to pursue the goal of "eating") was manipulated by priming them with eating-related vs. neutral words. Participants were subsequently asked to rate their interest in different types of foods, some healthy and some unhealthy (i.e. highly caloric and fatty) but tasty. As a measure of alternative goal inhibition, in a lexical decision task, I recorded participants' reaction times to diet-related words. I hypothesized that priming participants with eating-related words during lunch hours would increase their experienced level of hunger, and therefore their commitment to the goal of "eating". Increased commitment should inhibit the alternative goal of "healthy diet" reducing its multifinality constraints on means to the focal goal. Consequently, I expected hungrier participants to find a higher number of foods appealing, than the less hungry participants. Specifically, if hungrier participants do *inhibit* the alternative goal of "keeping a healthy diet" they should be less selective with regard to the foods they choose. Thus, I expected hungrier participants to be interested in all types of food, regardless of their health value. By contrast, the less hungry participants presumed to have the "eating" and "healthy diet" goals in mind were expected to be more interested in healthy (i.e., low calorie and low fat) versus unhealthy (i.e., high calorie and high fat) foods.

Method

Participants. Sixty-one University of Maryland, psychology majors participated in the experiment in exchange for course credit. Participants rated (on 10-point scales, 1 = "not at all," and 10 = a lot") the extent to which they watched their weight. They also rated their expectancy to eat healthy in the future. The two ratings were significantly

correlated ($r(60) = .48$, $p < .001$) and I averaged them into a single score of participants'

commitment to a healthy diet. Only participants who scored above the mid point (5) on

this measure were included in the experiment. Participants also reported whether they had

lunch or not and I only selected those participants who had not had lunch, leaving us with

43 participants, 13 males and 30 females. Participants' gender had no effect on any of the

results and will not be discussed further.

Procedure. Participants completed the entire experiment on desktop computers,

during lunch hours. They were informed that the experiment concerned "students'

culinary interests at different times of day. In addition to the questions related to their

weight watching and expectancy to eat healthy in the future, I asked participants to rate

how hungry and tired they were at that moment (1 = "not hungry/tired at all," 10 = "very

hungry/tired"). These questions were embedded among other, filler, items.

The manipulation was introduced after this initial round of ratings. In a lexical

decision task, participants were primed either with eating-related words ("lunch", "food",

"eat"), expected to increase their hunger experience, and, hence, their commitment to the

goal of "eating", or neutral/control words ("chair", "table", "cartoon", etc.) assumed to

have no such effect. As a cover story, participants were told that this "attentional task"

that they would be completing both at the beginning and at the end of the experiment

assesses people's ability to focus their attention at different times of day.

Specifically, participants were told that the task required them to identify as

quickly and as accurately as possible whether a presented target was a word or a non-

word. At the beginning of each trial, a fixation point ("X") appeared at the center of the

screen for 2 seconds to indicate to participants where to focus their attention. The fixation

point was then replaced by a target word or non-word. Participants were instructed to press the "1" key if the target was identified as a word and the "0" key if it was identified as a non-word.

After several practice trials including words as well as non-words, participants were presented with the 24 experimental trials. In the *high commitment* condition 18 of these contained eating-related words, 3 contained neutral words and 3 contained non-words. In the *low commitment* condition, 18 trials contained neutral words and 6 contained non-words. Note that since the only purpose of this task was to prime participants in the experimental (but not in the control) condition with eating-related words I did not record participants' reaction times. The primes used in this manipulation are listed in appendix D.

After completing the lexical decision task, participants were presented with a list of 20 foods (presented in appendix E) and were instructed to choose the ones that they wanted to eat at that moment. Ten of these foods were considered *unhealthy but tasty* ("pizza", "burger", "fries", etc) and ten were considered *healthy* ("salad", "vegetable soup", "strawberries"). I regarded the latter foods as *multifinal* serving as they did both the goal of "eating" and that of "keeping a healthy diet". The former, high-calorie, foods served solely the eating goal, hence in the present context I considered them "uni-final." In order to ensure that the foods were indeed perceived *unhealthy/tasty* vs. *healthy*, in a pre-test, two external raters, one male and one female rated each of the 20 foods on three dimensions: their caloric content (1 = high caloric, 7 = low caloric), healthiness (1 = not healthy at all, 7 = very healthy) and tastiness (1 = not tasty at all to 7 = very tasty). The inter-rater reliability was significant ($r(20)$ ranging from .44 to .83, $p < .05$). I therefore

averaged the two raters' scores into a single one for each dimension, caloric content, healthiness and tastiness. I then compared the two categories of foods (the unhealthy/tasty and the healthy) on each dimension. In contrast with the *unhealthy but tasty* foods, foods in the second category were indeed perceived to be less caloric ($M = 3.45$ vs. $M = 1.7$, $t(18) = 2.64$, $p = .01$), healthier ($M = 4.35$ vs. $M = 2.20$, $t(18) = 3.14$, $p < 01$), but equally tasty ($M = 6.10$ vs. $M = 5.95$, $t < 1$).

To assess whether high commitment to "eating" affected the accessibility of the alternative goal of "keeping a healthy diet" I used a similar procedure as the one used in Study 2. Specifically, in a lexical decision task, I measured participants' reaction times to 12 diet-related words (e.g., "diet", "thin", "fit", "calories") after subliminally (50ms) priming them with words related to the focal goal ("eat", "food", "lunch") and neutral words ("chair", "table", etc.) I also measured participants' reaction times to 12 neutral and non-words. All the words used in this lexical decision task are presented in appendix F. These thirty-six trials were presented in a random order. Finally, I measured again participants' degree of hunger and the extent to which they felt tired. I then administered a modified funnel-type debriefing procedure (Bargh & Chartrand, 2000) to ascertain that the primes did not reach the awareness threshold. None of the participants reported any awareness of the primes.

Results and Discussion

Manipulation check. An ANOVA conducted on participants' expressed degree of hunger following the priming manipulation and using their initial degree of hunger as a covariate showed that participants primed with eating-related words reported to be hungrier than those primed with neutral words ($M = 5.96$ vs. $M = 5.36$), $F(1, 40) = 6.39$, p

= .01. It thus appears that the induction of the hunger experience via priming was effective.

The Core Hypothesis. I hypothesized that an increased commitment to the focal goal of "eating" should result in a reduction of multifinality constraints imposed by the goal of "healthy diet" on means to the focal goal. Thus, I expected participants in the increased commitment condition to select as appealing a higher number of foods than participants in the control condition. Specifically, participants in the control condition should be more selective with regard to the foods they selected, restricting their "means' set" to foods that in addition to the "eating" goal would also fulfill the "healthy diet" goal. To test this hypothesis I conducted an analysis of variance on the number of foods participants selected. As predicted, participants primed with the eating words were interested in a greater number of foods than were participants primed with the neutral words ($M = 7.42$ vs. $M = 5.33$), $F(1, 41) = 5.47$, $p < .05$.

In order to test whether goal priming affected differently participants' preference for uni-final means (unhealthy foods) vs. multifnal means (healthy foods), I first calculated the number of healthy and non-healthy foods that each participant selected. I then conducted a repeated measures analysis of variance on these scores. A two-way interaction emerged between goal priming and type of foods ($F(1, 41) = 4.26$, $p < .05$). As shown in figure 7, participants who were not primed with the eating goal (thus were less committed to eating) were interested in a greater number of healthy foods ($M = 3.54$) than of non-healthy foods ($M = 1.79$), $t(23) = 4.27$, $p < .001$. However, participants primed with the eating goal (thus more committed to eating) were no more interested in the healthy foods ($M = 3.73$) than in the non-healthy ones ($M = 3.68$), $t < 1$, *ns.*)
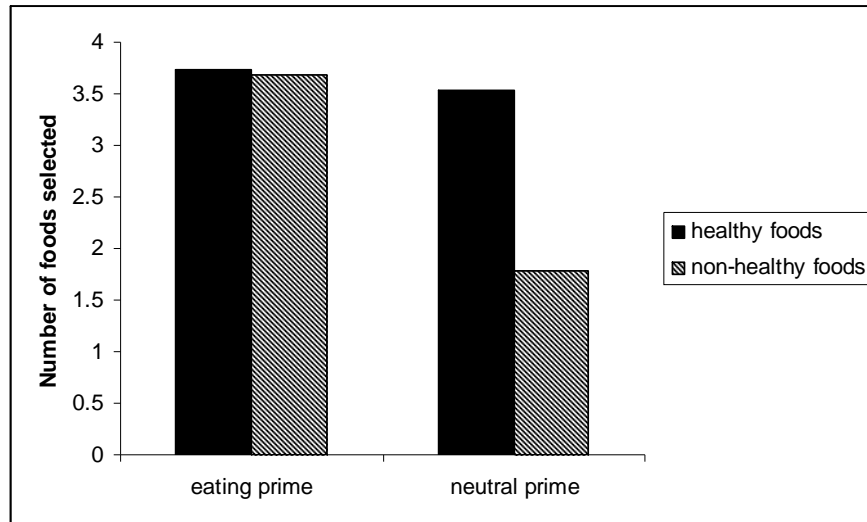
Figure 8 Number of healthy vs. non-healthy foods selected as means to the focal goal of eating as a function of commitment to eating (Study 3)

Intergoal inhibition. Finally, I checked whether increased commitment to "eating" resulted in the predicted inhibition of the "healthy diet" goal. To that end, I looked at participants' average reaction times to diet-related words after being primed with the focal goal vs. the neutral prime in the second lexical decision task. I assumed that inhibition, or lowered accessibility of the goal, would be indicated by longer reaction times (Fishbach, et al., 2003, Shah, et al., 2002). Again, I only used correct responses in the analyses and I first log-transformed the raw reaction times to lessen the influence of outliers (Fazio, 1990). I then performed a repeated measures analysis of variance on participants' average reaction time to the alternative goal of dieting when the focal goal served as prime vs. when a neutral word served as prime. After co-varying out the baseline reaction time to neutral targets and non-words significant two-way interaction

emerged between the prime (focal goal vs. neutral) as a within factor and commitment to "eating" as a between factor. ($F(1, 39) = 7.60$, $p < .01$). Hunger priming slowed down lexical decision times to diet-related targets. As depicted in figure 8, hungrier participants were significantly slower in recognizing diet-related words after being primed with the focal goal of eating than they were after being primed with a neutral prime ($M = 627.92$ ms vs. $M = 568.56$ ms, $F(1, 21) = 9.76$, $p < .01$). However, the less hungry participants in the control condition did not differ in their reaction times to diet-related words as a function of the prime ($M = 553.98$ ms vs. $M = 594.45$ ms, $F < 1$). These results support the hypothesis that increased commitment to a focal goal results in the inhibition of the alternative goal.
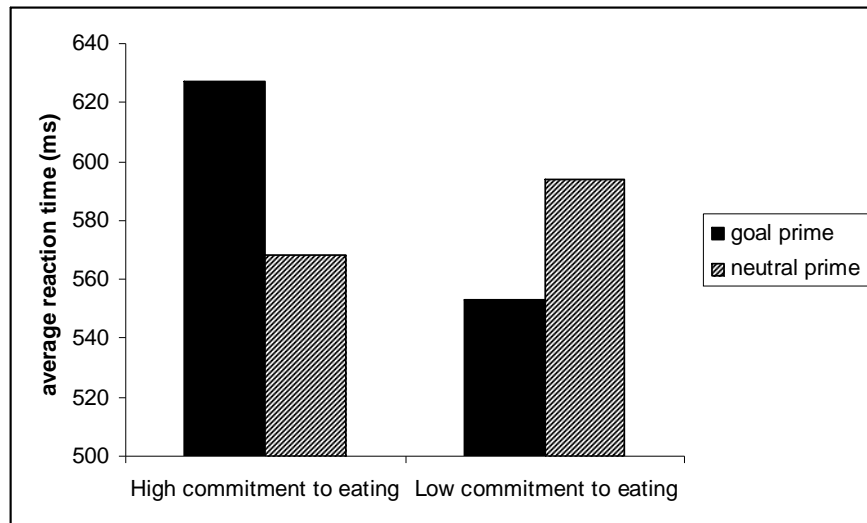

Figure 9 Lexical decision time for diet-related targets when primed with the focal goal of eating or with a neutral word (Study 3)

Mediation of commitment effects. To examine whether the effect of increased commitment to the focal goal (of eating) on number of "focal" means considered acceptable was mediated by an inhibition of participants' alternative goal of dieting I

conducted two regression analyses. I first regressed the number of means selected on

participants' average reaction times to the dieting goal while simultaneously controlling

for the baseline reaction time. A second regression was conducted to show that

accounting for the direct effect of differences in participants' reaction times to the dieting

goal eliminates the effect of commitment on the number of means (Baron & Kenny,

1986). The results of this analysis are presented in figure 9. As shown, participants'

reaction times to the dieting goal were found to have a significant positive effect on the

number of means ($\beta = .55$, $t = 3.26$, $p < .01$) and to render nonsignificant the previously

significant effect of increased commitment to the focal goal on the this number ($\beta = .17$

$ns.$). A Sobel test (Kenny, Kashy, & Bolger, 1998) revealed that the complete mediating

path was statistically significant $Z = 1.91$, $p = .05$.
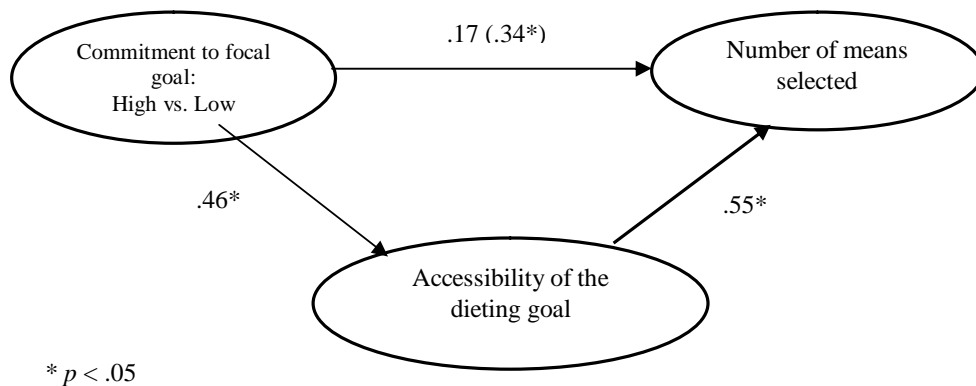
Figure 10 The effect of focal goal commitment on accessibility of the alternative goal and number of means selected (Study 3)

In summary, where participants' commitment to the focal goal of eating was

heightened by the priming manipulation, this resulted in an inhibition of the alternative,

"healthy diet" goal, which in turn has weakened the multifinality constraints it imposed

on means to the focal goal, and increased the number and variety of means to the focal goal (i.e., different foods) that participants found appealing. These results illustrate the process by which people's good intentions to maintain a healthy diet sometimes "evaporate" when they are hungry, namely by inhibiting the dieting goal while craving to satisfy the immediate eating goal.

General discussion

Theorizing on the dynamics of action, Atkinson and Birch (1970) assumed that at any given point in time many different action tendencies may coexist at varying strengths. This idea did not initially capture attention, as most research on goals and motivation traditionally considered each striving separately. Recently, however, researchers have begun paying attention to the fact that in numerous real life circumstances goals do not function in isolation but rather share psychological space with alternative objectives (Gollwitzer & Moskowitz, 1996; Kruglanski et al, 2002; Shah & Kruglanski, 2002). People's goals are often activated concurrently (or nearly so) by features of the external environment (Bargh & Ferguson, 2000) or by one's internal stream of associations (James, 1890; Kruglanski et al., 2002). Such goals may often appear to be in conflict with each other and to compete for individuals' limited resources (Anderson et al., 2004; Baumeister et al., 1998; Emmons & King, 1988; Shah & Kruglanski, 2002).

The existence of goal conflict frequently implies the need to exercise goal choice. This may entail abandonment (Lewin, 1935,, 1951; Miller, 1944), or inhibition (Shah et al., 2002) of some of the competing objectives. As Emmons (1996) pointed out, however, creative integration of one's strivings may be possible that would remove the detrimental effects of goal conflict on goal commitment, task performance, and affective experience. In the same vein, Cantor and Fleeson (1991, 1994) argued that people "tune" their goal pursuits, in the attempt to find the most suitable solutions under their personal circumstances. Consistent with these ideas, the present research explored the possibility

that even though people may hold several goals simultaneously, and even though such goals may come into conflict with each other, people may try to avoid the conflict by seeking common means to sub-serve a maximal number of their active objectives.

Multifinality Quest as a Strategy of Coping with Goal Conflict

These notions received support in the present research. Study 1 demonstrated the basic narrowing of the focal means' set when an alternative goal was introduced. Studies 2 and 3 explored, additionally, the possibility that a quest for multifinal means is subject to boundary conditions having to do with (1) perceived feasibility of identifying multifinal means, serving both the focal and the alternative goals (Study 2), and (2) the degree of commitment to the focal goal (Study 3). Specifically, Study 2 found that the relation between perceived feasibility of finding multifinal means and the reduction in the means' set-size selected for the focal goal is curvilinear. Substantial reduction may occur at an intermediate range of feasibility, while no reduction may occurs where finding alternative means is either very feasible or very unfeasible. Whereas under low feasibility conditions the absence of reduction attests to goal choice, and occurs alongside an inhibition of the alternative goal, under high feasibility conditions no inhibition seems to occur, as the means selected afford the pursuit of both the focal and the alternative goal.

These findings suggest that the *mere presence* of an alternative goal does not necessarily affect selection of means to the focal goal. It is rather the nature of the relationship between the focal and the alternative goal that does so. Thus, the number of the means to the focal goal is not affected if multifinal means to both goals can be readily found. This seems inconsistent with a distraction hypothesis whereby the mere introduction of an alternative goal should reduce the number of means to the focal goal

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via a pull of attentional resources. There is little reason to believe that the goals in the *high feasibility* or *low feasibility* conditions were any less distracting to participants than the goal in the *moderate feasibility* condition, yet they effected a significantly lesser reduction in means to the focal goal. It seems more likely that such reduction relates to the feasibility of finding multifinal means as presently suggested.

Finally, Study 3 found support for the notion that *increased commitment* to the focal goal weakens the multifinality constraints imposed by the alternative goals and expands the number of means to the focal goal to include unifinal ones (e.g., unhealthy but tasty foods compatible only with the 'eating' but not the 'healthy diet goal'). Study 3 also found evidence that increased commitment to the focal goal results in an inhibition of the alternative goal, and that this mediates its weakened constraining effect on means to the focal goal.

The present studies also contains evidence incompatible with an alternative interpretation of the present findings whereby introduction of the alternative goal reduces the *commitment* to the focal goal and that this is responsible for the observed reduction in the narrowing of the means' set-size. The latter interpretation suggests a mere numeric reduction in the number of means and has no implications for the kinds of means selected. In contrast, the demonstrable multifinality of means selected in the *moderate feasibility* condition of Study 2 and in the low hunger (lower commitment to eating) condition of Study 3, attests to participants' greater *selectivity*, unlikely to stem from a reduced commitment to the focal goal of eating. Rather, it seems to attest to a multifinality quest that the participants seem to have engaged in.

Multifinality quest in the broader context of research on goal pursuit

The present research is grounded in the theoretical assumptions about the structure and operation of goals that characterize the New Look approach to motivation. In this paradigm, goals constitute cognitive constructs that operate according to the basic principles of knowledge activation. By far the lion's share of the New Look research explored the phenomenon of goal activation and the extent to which an accessible goal is reflected in goal-relevant behavior. The research presented here aimed to move beyond documenting goal priming effects and to identify more subtle effects involving the calculated choice of behavioral plans or means for goal attainment. Unlike much of the research on goals, I assumed that goal pursuit and means choice occur in rich and complex contexts where the co-activation and pursuit of simultaneous goals is nearly inevitable. Given this assumption, the question that I tried to answer in the present research concerned the mechanisms underlying the choice of means to one's goals in the context o multiple goal pursuits.

The classic literature on goals referred to development of specific behavioral plans or strategies by which a goal can be attained (see Austin and Vancouver, 1996). Many goal-based models (Carver & Scheier, 1981; Heckhausen & Gollwitzer, 1987; Gollwitzer, 1993; Locke & Latham, 1990; Locke & Latham, 2002) conceived of behavior as an end point of a conscious, deliberate process by which individuals create plans "by reflecting and deciding on when, where, and how" to act. (Gollwitzer & Moskowitz, 1996). According to these models, plans allow people to mentally simulate goal pursuit, by testing alternative actions and by preparing for difficulties they anticipate during goal pursuit such as the necessity to juggle multiple and often conflicting objectives

(Gollwitzer, 1993; Kuhl, 1984; Michel, Cantor, & Feldman, 1996; Seijts & Latham, 2001; Winters & Latham, 1996).

By contrast with this classic research that presents a deliberate and effortful process of means selection, my research shows that such process derives directly from the structural and motivational principles of goals systems and may occur unconsciously. Specifically, the assumption that goal systems consist of mentally represented networks wherein goals may be cognitively associated to their corresponding means of attainment and to alternative goals via facilitative and inhibitory links implies the possibility that activation of a specific goal will automatically result in the activation of other constructs associated with that goal, including its means of attainment. Indeed, growing empirical evidence support the idea that one characteristic of goal pursuit includes the accessibility of goal-relevant knowledge, goal-relevant evaluations, choice and behavior (see Fishbach & Ferguson, 2007 for a review). The research presented here provides additional support for this notion. However, unique to my research is the evidence suggesting that the principle of accessibility does not apply indiscriminatingly to the choice of means to advance goal pursuit, but is constrained by other motivational concerns such as outcome maximization. Specifically, I showed that during goal pursuit people chose means that would advance their simultaneous objectives and thus provide them with the maximal attainable value. When such a choice becomes excessively difficult, or impossible, or when the pursuit of the focal goal is very important, in order to maximize their outcome people resort to goal choice whereby alternative goals are inhibited. By inhibiting the alternative goals, people reallocate their resources to the successful attainment of their focal, and often more important goal in that particular context.

Although my research does not provide direct evidence for the unconscious aspect of means choice during multiple goal pursuit, the methodology that I used whereby the alternative goal was subliminally primed (particularly in Study 2) allows one to speculate that participants in this research may have been unaware of the real reasons driving their choice. Such speculation is encouraged by similar research which provides direct evidence that people may not be cognizant about the multifinal nature of the choices, nor of the background goals that might have affected it (Chun et al., 2005).

Implications and future directions

The quest for multifinal means appears quite rational and superior to a goal choice, as it promises to preserve the "cake", while eating it too, representing a "best of possible worlds" motivationally speaking. Nonetheless, identifying multifinal means has a down side as well, related to the reduced number of means to the focal goal that one might end up as a consequence of the effort to attain multifinality. Particularly where none of the generated means is *assured* to effect goal attainment, reduction in the overall number of means may also reduce the overall perceived attainment likelihood. Thus, the tradeoff here may involve increasing the (subjective) likelihood of attaining both the focal and the alternative goals while decreasing the attainment likelihood of the focal goal as such.

Dilution or multifinality. Consistent with this idea, Zhang, Fishbach, and Kruglanski (2007) showed that increasing the number of goals that a single means can satisfy weakens the associative strength between that means and each individual goal and as a result it dilutes the perception of its instrumentality with respect to each goal. Indeed, in the present research I have seen that where commitment to the focal goal of eating

increased (in Study 3) the impact on individuals' means selection seemed to reflect an attempt to increase the likelihood of attaining the focal goal at the expense of attaining *both* it and the alternative goal. However, such process may sometimes be detrimental to self-regulation. Imagine the case of a diabetic person who needs to feed himself or herself while sticking to a rigorous low-carbohydrate diet even when he or she is very hungry (thus very committed to eating). In this particular case, choosing indiscriminately between foods to alleviate the hunger and "forgetting" about the diet may have grave consequences. It will be in this persons' best interest to *train* himself/herself to counteract the dilution effect and opt for multifinal means (choose foods that will not put the dieting goal in danger) even when very hungry. Future research should address directly the impact of perceived instrumentality of the means and goal commitment on the means choice. Although the instrumentality of the multifinal means with respect to the focal goal (and thus the likelihood of being chosen during goal pursuit) may be diluted by its associations with other goals, one interesting possibility is that multifinal means sometimes becomes the most instrumental means to one's focal goal (e. g. by experimentally strengthening the association between the focal goal and the means). In such circumstances one should be able to eliminate the effect of increased commitment to the focal goal on the quest for multifinal means and to show that people still prefer the multifinal means. In addition, the automatization of preference for multifinal means in the presence of the focal goal may result in a bottom-up priming of the alternative goal (by the means) which may counteract the process of goal choice that is typically associated with increased goal commitment.

Effects of increased commitment to the focal goal on range of acceptable means to that goal may have important real-life implications. Consider an increase in commitment to the goal of (personal and national) security occasioned by a belligerent enemy activity, e.g. an act of terrorism. This may inhibit the alternative goals derived from values of civil liberties, personal freedom, or the humane treatment of others. Consequently, various activities and policies might appear acceptable because they seem to serve the security goal, in oblivion of their consequences for other values and concerns. In other words, the multifinality constraint effect examined here in the context of simple individualistic pursuits (like health, or dieting) may have considerable social political implications that one may well want to investigate in further pertinent research.

Commitment to the alternative goal. The research presented in this dissertation addresses only the impact of increased commitment to the focal goal on the quest for multifinal means. However, people often find themselves caught between equally important objectives such as career and family. The impact of a highly important alternative goal on the quest for means to an equally important focal goal requires further investigation. One possibility is that in such circumstances, when the focal and alternative goals are equally important, people will try harder to find common means and their effort will be reflected in more time devoted to find such means and in a better ability to find them compared to people for whom the two goals are of unequal importance.

Instability in the preference for means. The underlying assumption of the multifinality constraints effect refers to the instability in one's preference for means to the same focal goal depending on the alternative goal that happens to be currently active. My research so far shows that a multifinality consideration would narrow the set of

means to a focal goal by inducing a preference for multifinal means, that is, means assumed to be instrumental also to the pursuit of alternative objective. However, in future research, it would be interesting to explore how people specifically shift their preference for means to the same focal goal as a function of different active alternative goals.

Conclusion

Traditionally, pursuit of multiple goals has been approached from the perspective of an inter-goal conflict (Lewin, 1935, 1951; Miller, 1944) and the presumed inevitability of goal choice. More recent analyses, however, raise the possibility that people devise self-regulatory strategies that circumvent the (unpleasant) necessity of sacrificing one goal for another, and seek instead ways of pursuing all present goal via the same means, attempting to "kill two (or more) birds with one stone" as it were (Kruglanski et al., 2002; Shah & Kruglanski, 2002). The present research explored the implications of such strategy for the process of means generation and evaluation. The results suggest that activation of alternative goals reduces the number of means generated (or deemed acceptable) for the focal goal, that such process is likely due to the multifinality constraints imposed by these alternative goals, and that two important boundary conditions for such a process derive from 1) the perceived feasibility of finding multifinal means 2) the degree of commitment to the focal goal.

Appendix A

The list of foods presented to participants in Study 1

☐ Salad   ☐ Tacos
☐ Shrimps   ☐ Pancakes
☐ Fresh fruits   ☐ Soup
☐ Steak   ☐ Chinese
☐ Muffin   ☐ Baked Potato
☐ Pizza   ☐ Crab cakes
☐ Salmon   ☐ Burger
☐ Fries   ☐ Pasta
☐ Sandwich   ☐ Prime Ribs
☐ Hot dog   ☐ Macaroni and cheese

Appendix B

The list of activities (means) presented to participants in Study 2

1. eat well
2. watch less TV
3. wake up early
4. join a team
5. work hard
6. do school work
7. go out more
8. eat breakfast
9. prepare ahead
10. drink less alcohol
11. be motivated
12. wash hands
13. walk more
14. have a positive attitude
15. manage time well
16. stay focused
17. be self-disciplined
18. take vitamins
19. smile
20. drink milk
21. eat more proteins
22. manage stress
23. work out
24. make friends
25. go to the gym
26. drink water
27. stay active
28. avoid drugs
29. sleep well
30. go to regular check-ups

Appendix C

The list of words used to prime the alternative goal in Study 2.

	Alternative goal		
	"Do well in school"	"Drink alcohol"	"Be in shape"
Primes	school	abuse	body
	grades	alcohol	figure
	exam	drunk	shape
	study	beer	exercise
	class	booze	size

Appendix D

The list of "eating" related and neutral primes used in Study 3

Eating	Neutral
food	paper
eat	plane
restaurant	shampoo
appetite	cartoon
meals	notebook
snack	computer
buffet	drive
hunger	clothes
brunch	forest
dining	chair

Appendix E

The list of foods presented to participants in Study 3

- ☐ salad
- ☐ shrimp
- ☐ apple
- ☐ steak
- ☐ muffin
- ☐ pizza
- ☐ salmon
- ☐ fries
- ☐ turkey
- ☐ hot dog
- ☐ tacos
- ☐ carrots
- ☐ vegetable soup
- ☐ Chinese food
- ☐ chicken nuggets
- ☐ yogurt
- ☐ burger
- ☐ pasta
- ☐ watermelon
- ☐ strawberries

Appendix F

The list of "diet" related targets used in the lexical decision task in Study 3

Primes		Targets		
Neutral	Focal goal (Eating)	Alternative goal (diet)	Neutral	Non-words
swim	food	slender	paper	hsghdghs
apartment	eat	shape	plane	adhgsdh
chair	restaurant	figure	shampoo	ahfgdsfd
country	appetite	thin	cartoon	gdfgsdfgs
table	meals	healthy	notebook	bcxvbcvb
drive	snack	calories	computer	sghdghd
clothes	buffet	diet		
forest	hunger	waistline		
chair	brunch	fit		
pencil	dining	weight		
		lean		
		athletic		

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