

Needs and Incentives as Sources of Goals

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To clarify what researchers may have in mind when referring to needs (motives), incentives, and goals, let us start with a historical overview of how these terms have been used in research on motivation. Based on learning theory advanced by early animal psychologists (Hull, 1943; 1952; Spence, 1956), the strength of the tendency to make a response and thus an organism's *motivation* to show this response was considered to be a function of an organism's skills (or habit strength), its needs, and the incentive value of the outcome. For example, how quickly an animal runs toward a box containing food was said to depend on its habit strength, its hunger (need), and the quality and quantity of food. However, with the advance of the cognitive revolution in psychology, these determinants of motivation as well as the concept of motivation itself became ever more elaborated.

The neo-behaviorist Tolman (1932, 1952) postulated various mental processes “which intermediate in the causal equation between environmental stimuli and ... overt behavior.” (Tolman, 1932, p. 2). These intermediate processes entailed concepts of purpose (ends and means) as well as expectations (e.g., means-expectations, end-expectations, and means-end-expectations). The social psychologists Festinger (1942) and Atkinson (1957) drew on that work in their research on what motivates humans to select and perform tasks of varying difficulty. They suggested that people weight the incentive value of the desired outcome with the expectancy that it would actually occur.

Social cognitive learning theorists (e.g., Bandura, 1982) went a step further, factoring in whether one could successfully perform the necessary behavior required to arrive at a desired outcome (efficacy or control beliefs). These theorists also alluded to

further relevant expectancies, such as whether the situation by itself would produce the desired outcome (Heckhausen, 1977), whether performing a given behavior would lead to the desired outcome (Bandura, 1977, 1982), whether achieving the desired outcome would be instrumental to accruing further positive consequences (Vroom, 1964), whether a specified future outcome can be attained (Oettingen & Mayer, 2002), and whether the future in general would be bright (Scheier & Carver, 1987; Abramson, Seligman, & Teasdale, 1978).

Adding these expectancy-related variables helped to explicate in more detail what Hull and Spence tried to capture with the concept of habit strength, that is, the can-aspect (or feasibility aspect) of the motivation to make a certain response: Can the desired outcome be brought about? But the cognitive revolution also helped to explicate the want-aspect (or desirability aspect) of the motivation to make a certain response: Do I really want the desired outcome? This desirability issue was originally captured by Hull and Spence with the concept of need and the concept of incentive. Whereas terms like habit strength refer to the way learning and experience shape behavior, needs and incentives refer to the influence of internal states and the subjective characteristics of particular stimuli, respectively. Needs were initially understood to result from deprivation and they stimulated behavior that would correct the deprivation. Originally, Hull (1943) defined the tendency to make a particular response as a multiplicative function of habit strength and drive; drive reflected the force of a need in terms of the number of hours of deprivation. Incentive value was later added to this model (multiplicatively by Hull, but additively by Spence as he wanted to suggest that incentive can affect behavioral

readiness even when the need level is zero) to account for the fact that for example, rats in a maze ran faster for more or tastier food.

With respect to need, the cognitively-inspired psychology of motivation ventured into the concept of motives (for a summary see McClelland, 1985a), defined as the class of incentives that are intuitively attractive to the person (e.g., achievement, power, affiliation, intimacy). More importantly, McClelland (1985b) discovered that depending on whether this preference for certain classes of incentives was measured implicitly (as assessed by the Thematic Apperception Test; TAT) or explicitly (as assessed by attitude questionnaires), it predicts the execution of different types of motive-related responses. It was also found that whether an incentive is hoped for versus feared matters greatly. For instance, a person with a strong achievement motive, longing for the pride associated with success, will choose a task of medium difficulty to pursue; this level of difficulty provides the most information about achievement level. However, a person who abhors the shame associated with failure (Atkinson, 1958, 1964) will choose either a very easy or a very difficult task, which is an effective strategy to avoid shame (as very easy tasks are likely to be solved, and failure on too-difficult tasks can easily be explained). Finally, researchers have differentiated among types of incentives as well (Heckhausen, 1977). For instance, in the realm of achievement, anticipation of positive self-evaluations (e.g., “I did really well!”), positive evaluations by others (e.g., praise by the teacher), higher order positive consequences (e.g., successful professional career), and consequences that go beyond achievement (e.g., having a good time with co-workers) can all motivate people to do well on given tasks.

Given these conceptual developments regarding the concept of needs and incentives one wonders why the psychology of motivation needed the concept of goals? In our opinion, the concept of goals was helpful for predicting whether one response tendency is selected over another, and whether the chosen one is engaged in with strong or weak determination. Most importantly in this regard, Ajzen and Fishbein (1969) suggested that a person's readiness to enact a response tendency can be assessed in terms of the strength of a person's intention to make the response. Mischel (1973) went a step further and argued that such intentions can be conceived of as self-imposed goals that imply standards that the person intends to meet (with respect to quality and quantity criteria). It is important to note here that this conceptualization of the term goal is quite different from how the same term had been used by the animal psychologists of motivation. In their behavioristic approach (e.g., Skinner, 1953; Bindra, 1959), a goal was nothing but a powerful incentive, defined as objects and events that affect an organism's behavior radically and reliably (e.g., food, sexual stimulation, a sudden loud noise). Whether an object or event was treated as a goal however depended solely on the investigator's perspective on the organism's behavior. If the investigator selected a certain incentive as a reference point for the description of respective behavior, this incentive became a goal. For example, Skinner (1953) referred to the food that is provided as incentive to explore a maze as the animal's goal (or reason) to run through the maze. In the behaviorist tradition, the reference point for goal-directed behavior is thus not the goal set by the organisms themselves. Behaviorists did not want to analyze internal goals or the processes leading to goal setting and subsequent goal implementation. Skinner (1953) phrased this most cogently when he referred to goal

directedness as an effective and easy-to-use term for the description of persistent, appropriate, and searching behavior towards an incentive which results from some kind of learning.

Very much to the contrary, cognitive social learning theorists (e.g., Mischel, 1973; Bandura, 1989) considered goals as internal and subjective processes and states, and this had tremendous transformative consequences for the study of motivation: If one conceptualizes goal-directed responses in relation to subjective goals held by the individual (e.g., to get to know an attractive person), then one begins to ask new questions such as how people set themselves such goals, and how they strive to achieve them. Present day researchers (see e.g. the action phases model; Heckhausen & Gollwitzer, 1987; Gollwitzer, 1990) therefore highlight the distinction between goal setting and goal striving as suggested early on by Kurt Lewin (Lewin, Dembo, Festinger, & Sears, 1944). Today research on goals explicitly targets either the determinants and processes of goal setting or the determinants and processes of goal striving and successful goal attainment.

Conceptualizing goals as internal and subjective has the additional advantage of differentiating the content of the goal from the responses that are performed in its service. This distinction has led to research on how goals are framed and how their framing facilitates different responses. For example, it matters whether an achievement goal is framed as a learning goal or a performance goal (e.g., “I want to learn from performing the task” versus “I want to demonstrate my abilities”: Dweck, 1996). Also, conceptualizing goals as subjective internal states allows for raising the question of whether the mental representation of a goal can be activated outside of a person’s

awareness (as suggested in the auto-motive model; Bargh, 1990), and given that goals are internal mental representations, one can ask how such mental representations relate to the representations of other goals, sub-goals, and means of attainment (Kruglanski, 1996).

Motives/Needs as Personal Determinants of Goal Desirability

As suggested above, needs/motives and incentives speak to the desirability of a goal. If one assumes that people set themselves goals which they find attractive (e.g., Gollwitzer, 1990; Ajzen & Fishbein, 1969), they should select those goals for themselves that target outcomes which satisfy their needs/motives; moreover, when these outcomes have features that suggest a strong incentive value, this should further increase perceived desirability of the intended outcome and thus further strengthen a person's readiness to commit to the goal in question. There are numerous lines of research that support this assumption.

As broader internal states, needs are often distinguished as belonging to various categories. On the one hand, research finds that for humans, psychological needs, like the achievement motive, have effects similar to those of physiological needs (like hunger; e.g., McClelland, Atkinson, & Clark, 1949). Developmental models of needs have argued that it is important to differentiate various types of needs in order to understand which needs a person is likely to serve at a given time. For example, Maslow (1943) organized needs as a hierarchy or pyramid, with physiological (breathing, food, water) at the base, followed by safety (employment, morality), love/belonging (friendship, family), esteem (confidence, achievement), and finally self-actualization (creativity, spontaneity) at the top. Only when lower-order needs were satisfied could people progress to a higher level. Maslow applied his conceptualization to a person's lifetime, as he considered progressing

through the need hierarchy to be a developmental task. If a lower set of needs were no longer met, an individual would temporarily prioritize them, but would not permanently regress to the lower level of the hierarchy. More recent work has refined Maslow's hierarchy, such that need-related goal systems are considered to be overlapping rather than completely hierarchical. Once a goal system – such as those for addressing physiological, self-protection, or affiliation needs – has developed, it is likely to be activated whenever relevant environmental cues are salient (Kenrick, Griskevicius, Neuberg, & Schaller, 2010). Also, in most modern conceptualizations needs are categorized as physiological (thirst, hunger, sex), psychological (autonomy, competence, relatedness), or social (achievement, intimacy, power). In this framework, psychological needs are those that are universal, inherent, and part of human nature, whereas social needs are shaped by individual experiences and thus vary considerably between people (Reeve, 2008).

Achievement, Power, and Affiliation

In McClelland's (1985b) analysis of motives it is assumed that three central motives guide behavior by their unique anticipated goal states. The central motives McClelland distinguishes are achievement, power, and affiliation; each of them is linked to a typical desired goal state (i.e., meeting a high standard of excellence in a challenging task for the achievement motive) that is assumed to lead to a typical positive affect (i.e., pride for the achievement motive). The individual preference for one or the other type of goal state is defined as a person's motive disposition that is assumed to be stable over time. A person with one or the other motive disposition learns over time which situations allow striving for the respective desired goal states, and acquires a behavioral repertoire

to successfully do so. The distinction between the three motives has found ample support in psycho-biology (e.g., Schultheiss, 2007; Schultheiss, Campbell, & McClelland, 1999; Schultheiss; Dargel, & Rohde, 2003; Schultheiss & Rohde, 2002; Schultheiss, Wirth, & Stanton, 2004; Schultheiss et al., 2005; Wirth, Welsh, & Schultheiss, 2006; Schultheiss & Wirth, 2010). For example, Stanton and Schultheiss (2009) reviewed results indicating that sympathetic catecholamines, testosterone, cortisol, and estradiol were all correlated with implicit power needs, and synthesized these findings with animal research on the physiology of dominance behavior in order to propose a biological model whereby the dispositional need for power is intertwined with dominance physiology.

It is assumed that people possess the named motives to a different degree, which affects how many situations a person perceives as relevant for motive satisfaction and how strong is the anticipated affect for respective goal attainments. The strength of the individual motive disposition is commonly assessed by the TAT (i.e., the Thematic Apperception Test; see Schultheiss & Pang, 2007, for recent versions of this test). The TAT presents pictures containing scenes that relate to the three motives but are ambiguous enough to allow for different interpretations. Test takers are encouraged to freely associate to these pictures, arriving at a story that answers questions such as: What is happening here? What led up this situation? What will happen next? The story is then content analyzed using a differentiated coding scheme that allows assigning scores to people for each of the three motives. People with high scores on the achievement motive, for instance, have been found to set themselves more challenging goals and to pursue these goals with more persistence. When it comes to more general measures of successful achievement, e.g., success in one's professional career, it pays to consider the

constellation of the three motives. For instance, it has been found that the constellation of a high need for power and a low need for affiliation predicts the success of business managers; an additional high need for achievement is beneficial to low level managers who still need to make individual contributions whereas high level managers who can extensively delegate things to others benefit from an additional low need for achievement (McClelland & Boyatzis, 1982).

To circumvent the intricate content analysis of TAT stories, researchers have also developed questionnaires to assess the three motives. As it turned out however, only very moderate correlations are typically observed between TAT-scores and respective questionnaire scores. This made McClelland, Koestner, and Weinberger (1989) distinguish between two types of motives: implicit versus explicit motives. Implicit versus explicit motives are assumed to originate in different ways (acquired through affective experiences vs. verbal communication with others), are linked to different incentives (activity-related excitement vs. social-evaluative feedback), and instigate distinct behaviors (spontaneous intuitive action vs. action that is based on extensive deliberation). Implicit motives, in contrast to explicit motives, are not easily accessed by conscious thought and thus cannot be assessed by self-report questionnaires.

The distinction between these two types of motives spawned a large body of subsequent research. First, it appears that the statistical independence of implicit versus explicit motives is indeed valid and not merely an artifact of their being measured in different ways. Schultheiss, Yankova, Dirilikvo, and Schad (2009) measured implicit and explicit motives using cue- and response-matched versions of the Picture Story Exercise

(PSE: McClelland et al. 1989), and still found little overlap between the two motives (see also Thrash, Elliot, & Schultheiss, 2007).

Second, as the two motive systems are assumed to be independent, research has ventured into studying the consequences of different degrees of overlap between the two. It was found that a discrepancy between the two systems qualifies as a chronic internal stressor (Baumann, Kaschel, & Kuhl, 2005), as subjective well-being and general goal attainment rates are negatively affected (Brunstein, 2006), and the negative health behavior patterns observed with people suffering from chronic stress are observed as well (Job, Oertig, Allemand, & Brandstätter, in press).

Third, empirical studies largely support McClelland et al.'s contention that implicit and explicit motives differ in their ways of guiding behavior. For example, in a study where effort-related task engagement was measured via speed of responding and choice-related task engagement via the choice to continue working on the test task, the implicit motive to achieve predicted the former and the explicit motive to achieve predicted the latter (Brunstein & Maier, 2005). Further, each motive type was found to be responsive to a different type of feedback: implicit motives interacted with feedback that referred to the participant's own previous level of achievement, whereas explicit motives interacted with feedback that referred to the achievement of a social reference group. Although implicit and explicit motives thus appear to "represent two orthogonal psychological needs that respond to specific standards of excellence and predict different types of behavior" (p. 219), they may work in combination as well. Specifically, Brunstein and Maier suggest that because solving difficult tasks serves as a strong incentive, this might stimulate the implicit need for achievement. Thus, an implicit need

for achievement would mediate the effect of an explicit achievement need geared towards outperforming others on the task at hand.

Further Relevant Needs/Motives

According to *self-determination theory (SDT)*, the needs for competence, relatedness, and autonomy are essential for constructive human development (Ryan & Deci, 2000). People can promote well-being by pursuing and attaining goals that satisfy the needs for competence, relatedness, and autonomy; the pursuit of other goals (e.g., materialistic goals) does not contribute to and may even detract from well-being (Ryan, Sheldon, Kasser, & Deci, 1996). Research in the SDT framework has largely concentrated on how these needs can be thwarted or satisfied, and how their satisfaction allows people to flourish, rather than on how these needs shape goal choice and pursuit. However, SDT points to intrinsic motivational orientation as a consequence of possessing self-determination needs; this orientation in turn is seen as a key determinant of the human “tendency to seek out novelty and challenges, to extend and exercise one’s capacities, to explore, and to learn” (Ryan & Deci, 2000, p. 70). As the pursuit of novelty, exploration, and learning should inform one’s goals, investigating the determinants of a low/high intrinsic orientation helps to elucidate goal choice.

Intrinsic motivation is diminished by extrinsic rewards (Deci, Koestner, & Ryan, 1999), threats, deadlines, directives, pressured evaluations, and imposed goals, because these factors promote an external locus of causality; intrinsic motivation can be enhanced however by choice, acknowledgment of feelings, opportunities for self-direction, and autonomy-supportive teachers and caregivers, that is by factors that engender personal feelings of autonomy. Intrinsic motivation is also enhanced when relatedness (Anderson,

Manoogian, & Reznick, 1976; Ryan & Grolnick, 1986) and competence (Deci, 1975; Vallerand & Reid, 1984) needs are met. In sum, then, SDT suggests that people will choose and strive for goals that allow them to satisfy the needs for autonomy, relatedness, and competence.

Need for cognition is defined as a relatively stable tendency to engage in and enjoy effortful cognitive endeavors (Cacioppo & Petty, 1982; Cacioppo, Petty, Feinstein, & Jarvis, 1996). It is typically indexed via self-report measures like the Need for Cognition Scale (NCS; Cacioppo, Petty, & Kao, 1984). Rather than being a stable tendency that people are born with, need for cognition is argued to be “the consequence of developing a sense of competence and self-satisfaction from repeated or prolonged episodes of effortful problem solving” (Cacioppo, Petty, Feinstein, & Jarvis, 1996, p. 199). Although many investigations have explored the role of need for cognition in information processing, attitude formation, attitude change, persuasion, and decision-making, relatively few have addressed need for cognition as a source of goals.

However, researchers assume that a stronger need for cognition results in less concern with conserving cognitive resources, and leads people to instead seek, acquire, and consider information in order to make sense of stimuli, relationships, and events in their world. Accordingly, individuals high in need for cognition should be more likely to pursue tasks and goals that require reasoning or problem solving (e.g., reading, comprehensive exams), whereas individuals low in need for cognition should be more likely to pursue tasks and goals that enable them to conserve cognitive resources (review by Cacioppo, Petty, Feinstein, & Jarvis, 1996). Need for cognition has also been shown to promote the acquisition of novel, complex skills via higher levels of self-efficacy and

an orientation toward learning (Day, Espejo, Kowollik, Boatman, & McEntire, 2007). Correlational data indicate that individuals high in need for cognition obtain more years of education (Davis, Severy, Kraus, & Whitaker, 1993), procrastinate less (Ferrari, 1992), seek out activities or information without concern for extrinsic reward contingencies (Amabile, Hill, Hennessey, & Tighe, 1994; Olson, Camp, & Fuller, 1984), and pursue and enjoy activities associated with high levels of sensation (Crowley & Hoyer, 1989; Olson et al., 1984) more so than individuals low in need for cognition.

These findings suggest that need for cognition may shape goal choice by influencing the activities that individuals find attractive – that is, by affecting the incentive value of these activities. Further, higher need for cognition gives rise to a stronger correspondence between attitudes and behavior (Cacioppo, Petty, Kao, & Rodriguez, 1986). Accordingly, a higher need for cognition might engender a stronger link between one's attitudes and goals, resulting in goal choices that more strongly correspond to attitudes.

A strong need for cognition may also affect goal setting by moderating the effect of goal priming. A high need for cognition means that constructs are generally easier to activate, that people engage in more thinking, providing more opportunity for priming to bias judgment, and that judgments are based more on thinking, and so biased thoughts should have a greater impact on judgment (Petty & Jarvis, 1996). Indeed, when primes are subtle (e.g., presented subliminally or via word-completion tasks with a low ratio of prime-to-filler words), priming has stronger effects on behavior and judgment the higher participants' need for cognition (Petty, DeMarree, Briñol, Horcajo, & Strathman, 2008). However, need for cognition also increases the person's willingness to engage in effortful

processes of cognitive correction when one's judgments are suspected to be biased (D'Agostino & Fincher-Kiefer, 1992), and in line with this, blatant priming (e.g. via word-completion tasks with a high ratio of prime-to-filler words) is found to have weaker effects the stronger participants' need for cognition (Petty et al., 2008).

Need for cognitive closure refers to the desire for a firm answer to a question, accompanied by an aversion toward ambiguity (Webster & Kruglanski, 1994). Need for closure may fluctuate in response to contextual variables like time pressure or perceived costs of further information processing, but it is also assumed to be a relative stable individual tendency. Kruglanski and Webster (1996) argue that the need for cognitive closure guides activities aimed at attaining closure, as well as biasing choices toward constrained rather than open-ended pursuits. Research has largely examined effects of need for closure on decision-making and information processing rather than goal choice per se. As does need for cognition, need for closure can moderate priming effects; high need for closure predicts stronger assimilation of judgments to primes (Ford & Kruglanski, 1995; Thompson, Roman, Moscovitz, Chaiken, & Bargh, 1994). Need for closure, manipulated as well as measured, also shapes the preference for working with a persuasive versus easily persuadable partner, and leads participants who have received enough information to form an opinion to argue longer when forced to reach a consensus (Kruglanski, Webster, & Klem, 1993). Recent findings indicate that the need for closure is associated with valuing security, conformity, and tradition rather than stimulation and self-direction (Calogero, Bardi, & Sutton, 2009), so it should influence goal selection by pointing people toward goals that satisfy these values.

One area of research on needs explicitly addresses the issue of goals; this research refers to the domain of achievement. Achievement goals are believed to stem from the *need for achievement*, the *need to avoid failure*, and perceptions of personal competence (Elliot & Church, 1997). Recognizing that competence can be defined as an absolute standard (i.e., mastery) or relative to a normative standard (i.e., performance), and may be framed in terms of a positive possibility to approach (i.e., success) or a negative possibility to avoid (i.e., failure), Elliot and his colleagues used this 2 X 2 framework to distinguish four types of achievement goals: *mastery-approach* (focused on attaining task-based or intrapersonal competence), *performance-approach* (focused on attaining normative competence), *mastery-avoidance* (focused on avoiding task-based or intrapersonal incompetence), and *performance-avoidance* (focused on avoiding normative incompetence) (Elliot & McGregor, 2001; Elliot & Murayama, 2008). Specifically, a strong achievement motive and positive competence perceptions lead people to adopt mastery goals; a strong achievement motive, positive competence perceptions, and high fear of failure lead people to adopt performance-approach goals; negative competence perceptions and high fear of failure lead people to adopt performance-avoidance goals (Elliot & Church, 1997). People benefit from adopting goals that are a fit to their needs and competence perceptions: in one study striving for approach goals (both mastery and performance) predicted experiences of positive affect and well-being only for people who had a strong achievement motive (Job, Langens, & Brandstätter, 2009).

The different types of achievement goals are not only adopted to fit different needs, they also have different consequences. Holding performance approach goals

predicts high performance, whereas holding mastery approach goals predicts feelings of motivation (Elliot & Sheldon, 1997). On the other hand, avoidance goals appear to be detrimental for academic achievement, even if these goals are a good “fit” to a person’s regulatory style. For example, avoidance goals predicted lower exam scores whether participants chronically focused on accomplishing their hopes and aspirations (i.e., promotion focus) or on trying not to fail at duties and obligations (prevention focus) (Sullivan, Worth, Baldwin, & Rothman, 2006). One line of research proposes that the link between achievement goals and performance is explained by emotions in the achievement context: mastery goals yield enjoyment, low boredom, and low anger, performance-approach goals yield hope and pride, and performance-avoidance goals yield anxiety, shame, and hopelessness, feelings which in turn affect achievement (Pekrun, Elliot, & Maier, 2009). A further reason that performance approach goals may particularly enhance performance is that they lead people to be more exploitative in obtaining and using information that can promote goal achievement, compared to mastery or no goals (Poortvliet, Janssen, Van Yperen, & Van de Vliert, 2007).

Elliot and McGregor’s (2001; Elliot, 2008) distinction of *approach versus avoidance motives*, has been applied within but also outside the domain of academic achievement. It is assumed that approach motives favor the selection of approach goals whereas avoidance motives favor the selection of avoidance goals. For example, with regard to social achievement (Horst, Finney, & Barron, 2007), friendship goals (Elliot, Gable, & Mapes, 2006; Gable, 2006), relationship sacrifices and satisfaction (Impett, Gable, & Peplau, 2005), sports performance (Thomassen & Halvari, 2007), eating behavior (Otis & Pelletier, 2008), and moderation of stereotype threat effects (Brodish &

Devine, 2009), approach goals were generally found to result in superior achievement. However, avoidance goals can also be beneficial, such as when people attempt to quit smoking (Worth, Sullivan, Hertel, Rothman, & Jeffery, 2005). Further, people may shift from general approach to avoidance orientations in response to situational cues. For example, participants who were made to feel threatened in their romantic relationships (by writing about “secret selves” which could negatively impact their relationship) became faster to identify avoidance words than approach words, whereas this difference was not observed in participants not made to feel a relationship threat (Cavallo, Fitzsimons, & Holmes, 2010). In a second study, threatened participants performed better on an avoidance-framed task than control participants, suggesting that the shift from approach to avoidance orientation following a relationship threat had consequences outside the relationship domain (Cavallo et al., 2010).

How Do Needs/Motives Affect Goal Choice?

Research on the perceptual and attentional correlates of needs provides insight into why and how these dispositional tendencies might guide goal selection. Needs are found to lead to a readiness to perceive stimuli that could address the need (i.e., incentives). Participants who were made thirsty were faster to recognize drinking-related words (e.g., cup, water) in a lexical decision task than participants who were not thirsty (Aarts, Dijksterhuis, & De Vries, 2001, Study 1). In a second experiment, thirsty participants also remembered more drinking-related objects (e.g., a glass, a bottle) that they had seen in a room (Aarts et al., 2001).

Needs are also found to predict people’s speed and precision identifying stimuli that are relevant in ways other than potentially offering need satisfaction. One

representative investigation found that people with a strong power motive oriented attention toward faces signaling low dominance and away from faces signaling high dominance; people with a strong affiliation motive were better at detecting faces signaling low affiliation (i.e., rejection) and also tended to orient attention toward faces signaling high affiliation (i.e., acceptance; Schultheiss & Hale, 2007). Likewise, being high on the fear of failure based achievement motive predicts higher arousal when viewing unpleasant images, and a bias to spend more time viewing failure images (Duley, Conroy, Morris, Wiley, & Janelle, 2005).

Interestingly, the effects of needs on perception can be altered by behavior. Compared to non-thirsty people, thirsty people perceived water bottles and water glasses as larger (Veling & Aarts, 2009; Veltkamp, Aarts, & Custers, 2008). However, this effect is reversed when participants are made to hold back from pursuing water by completing a go/no-go task in which water was paired with refraining from acting. Thirsty participants who had water paired with no-go cues perceived the water bottle and glass as smaller than did non-thirsty participants, suggesting that the reward value of an object is decreased when it is paired with cues that put behavior on hold.

Importantly, the motive-related differences in perception and attention have consequences for learning. On an implicit learning task, power-motivated individuals had enhanced performance for sequences paired with low-dominance facial expressions and impaired performance for sequences paired with high-dominance expressions, whereas affiliation-motivated individuals had impaired performance for sequences paired with hostile faces (Schultheiss, Pang, Torges, Wirth, & Treynor, 2005). In sum, the perception and attention research as well as psychophysiology research reported above suggests that

needs guide the content of goals in part by making need-related stimuli (i.e., incentives) particularly compelling and arousing.

Can Motives Affect Nonconscious Goal Activation?

The goal-priming literature (for review see Dijksterhuis, Chartrand, & Aarts, 2007) has shown that a goal can be activated without the individual knowing about or intending it – either through subliminal presentation of goal-relevant stimuli, or through subtle and unobtrusive supraliminal presentation. A wide variety of environmental triggers have been demonstrated: not only verbal stimuli semantically related to the goal (as in many studies), but also material objects such as backpacks and briefcases (Kay, Wheeler, Bargh, & Ross, 2004), scents such as cleaning fluids (Holland, Henriks, & Aarts, 2005), power-related features of a situation such as a professor’s desk chair (Chen, Lee-Chai, & Bargh, 2002), and the names of one’s significant others (Fitzsimons & Bargh, 2003; Shah, 2003). Moreover, a wide variety of goals have been shown capable of unconscious operation: information processing goals such as impression formation (Chartrand & Bargh, 1996; McCulloch, Ferguson, Kawada, & Bargh, 2008), achievement and task performance goals (Bargh, Gollwitzer, Lee-Chai, Barndollar, & Trötschel, 2001; Hassin, 2005), as well as interpersonal goals such as helping and cooperation (Bargh et al., 2001; Fitzsimons & Bargh, 2003). It has further been observed that once activated outside the person’s knowledge, these goals operate autonomously, without any conscious guidance, to direct cognition and behavior towards the desired end-state (see reviews in Bargh, 2005; Bargh & Ferguson, 2000; Chartrand & Bargh, 2002; Dijksterhuis et al., 2007; Ferguson, Hassin, & Bargh, 2008; Fitzsimons & Bargh, 2004).

Importantly, unconscious goals seem to produce similar outcomes as conscious goals, and they seem to do so by employing similar processes; even the phenomenal qualities of goal striving such as persistence in the face of obstacles and resumption of interrupted goal striving appear to be the same. The affective (mood) and motivational consequences of conscious and unconscious goal striving are also the same. The consequences of conscious goal striving for affective experience (mood) and the future strength of that goal after goal attainment or failure to reach the goal have long been established (e.g., Bandura, 1977; Heckhausen, 1991). Success produces positive mood and increased tendencies to pursue that goal in the future; failure produces the opposite consequences. Research on unconscious goal pursuit has shown that the same consequences accrue for goal striving the individual is not even aware of engaging in. Finally, Kawada, Oettingen, Gollwitzer, and Bargh (2004) observed that unconscious goals, when active, are also projected onto (i.e., attributed to) other people as is true for consciously held goals.

Given these similarities, one wonders whether a person's motives affect the activation (priming) of unconscious goals, given that the selection of conscious goals is known to be influenced by a person's motives. This issue has not attracted much research interest so far, but there is a relevant early goal priming study reported by Bargh and Gollwitzer (1994). Participants' chronic achievement and affiliation motives were measured, and they were then primed with either achievement, affiliation, or neutral words. Finally, they had to work as a team with another participant who was actually a confederate on a series of 5 word-search puzzles. The confederate performed poorly by design, showing frustration and embarrassment. By finding a lot of words, the participant

could thus fulfill the achievement goal but would make the confederate feel even worse; by “dumbing down,” on the other hand, the participant could sacrifice the achievement goal and serve the affiliation goal of preventing the confederate from feeling too bad. Results showed that the goal priming interacted with participants’ chronic motives: an initial priming effect (achievement-primed participants outperformed affiliation-primed participants) was eventually overtaken by a significant chronic motive effect. Namely, on the final trial, participants with chronically high achievement and low affiliation motives outperformed those with chronically low achievement and high affiliation motives, regardless of priming. It is thus not only the conscious selection of goals that respects a person’s motives; the nonconscious activation of goals seems to do so as well.

Incentives as Anticipated Positive Consequences of Goal Pursuit

The perceived desirability of a potential goal also depends on one’s evaluation (attitude towards) of the anticipated consequences of goal attainment. In theory, it is the sum total of the possible positive and negative consequences associated with the attainment of the potential goal, with each of these consequences weighted by its perceived likelihood of occurrence (Ajzen & Fishbein, 1980; Fishbein & Ajzen, 1975). In practice, of course, people may not go through such a comprehensive reasoning process to develop each attitude before committing to the goal.

Limits to a Comprehensive Analysis of Potential Consequences

First, holding *naïve theories* on how behavioral outcomes originate from a given goal pursuit limits the kind of consequences that are anticipated. For instance, Dweck and her colleagues (Dweck, 1999; Dweck & Leggett, 1988; Hong, Chiu, Dweck, Lin, & Wan, 1999; Molden & Dweck, 2006) have focused on implicit theories about the malleability

of human attributes, such as intelligence, personality, and moral character. When individuals view an attribute like intelligence as fixed (*entity theory*), they want to evaluate how much of the attribute they possess. When individuals view attributes as malleable (*incremental theory*), they want to cultivate the attribute in themselves. Thus, entity theorists should anticipate consequences of goal attainment that speak to the possession of capabilities; incremental theorists on the other hand should anticipate consequences that speak to how one can further develop one's capabilities. In this way, implicit theories shape the goals that people choose to pursue: learning goals in the case of incremental theorists, and performance goals in the case of entity theorists.

Just as the research of Deci and Ryan points out that external reward can dampen implicit motivation (Deci et al., 1999), Dweck and her colleagues have identified a way that external rewards, in the form of praise, can shape goal choice. In the latter case, the important variable is the topic of the praise. Implicit theories develop partially as a result of the feedback children are given. Praise that conveys person or trait judgments (e.g., "You're a good girl," "You're really good at this") results in less constructive responses to subsequent setbacks than praise that addresses a process (e.g., "You must have tried really hard," "You found a good way to do it, can you think of other ways that may also work?" Kamins & Dweck, 1999). Person praise, also referred to as generic praise because it suggests a general tendency, implies that there is a stable ability that underlies performance, which seems to lead children to construe ability as inherent and fixed (Cimpian, Arce, Markman, & Dweck, 2007). Likewise, praise for intelligence leads children to consider intelligence more as a fixed trait than as praise for hard work. Thus,

praise for intelligence leads children to care more about performance goals relative to learning goals than children praised for effort (Mueller & Dweck, 1998).

However, although some researchers have argued that mastery goals (i.e., learning goals) are roundly superior to performance goals, findings suggest that both have beneficial consequences (Barron & Harackiewicz, 2001). For example, mastery goals are associated with higher subsequent interest, and predict behavior like enrollment in additional courses on the same topic; performance goals on the other hand predict higher grades in the short- as well as long-term (Harackiewicz, Barron, Tauer, Carter, & Elliot, 2000). Moreover, performance goals only seem to undercut interest when pursued within evaluative contexts by people low in achievement orientation (Senko & Harackiewicz, 2002). Mastery goals may actually undermine academic achievement by leading students to preferentially allocate study time to material that they find appealing (Senko & Miles, 2008). Interestingly, recent research suggests that when students adopt mastery goals as a strategy for succeeding and not as a strategy for being viewed in a socially desirable way, then mastery goal endorsement does predict higher grades (Dompnier, Darnon, & Butera, 2009).

Within a given context, people are relatively stable in their endorsement of particular achievement goals (Senko & Harackiewicz, 2005). However, achievement goals also fluctuate, particularly after receiving feedback in the early stages of a new pursuit; gaining experience leads to adjusting goals to situational constraints and personal limitations. People high in fear of failure by being particularly sensitive to competence evaluation, are especially likely to change their relative endorsement of various achievement goals over time (Fryer & Elliot, 2007).

A second limitation of the comprehensive analysis of the potential consequences of attaining a potential goal rests in the fact that people may not be motivated to reflect on the desirability of a given goal choice. Different variables are known to affect the *motivation to deliberate on the desirability of a potential goal*. For instance, Cioffi and Garner (1996) found that requiring active choices of a goal (i.e., answering affirmative items to do volunteer work) led to thinking of more reasons why such a decision could be attractive than requiring only a passive choice to be made (i.e., skipping items that affirmed the opposite choice). Liberman and Trope (1998) reported that reflecting on a potential goal that is psychologically distant (e.g., acting on the goal is required in the distant future rather than near future) makes people focus on the goal's desirability, whereas a goal that is psychologically near (e.g., acting on the goal is required in the near future) triggers feasibility concerns. But considering a potential goal that is psychologically distant may not only turn the person's mind to the desirability of this goal but actually increase its perceived desirability. Specifically, when Vasquez and Buehler (2007) varied near versus far psychological distance by having people imagine the performance of a future task from a first or third person perspective, they observed that the importance of doing well (i.e., high desirability of goal attainment) increased by taking a third person perspective. The latter perspective produced higher desirability that in turn led to a stronger goal to do well on the task at hand. So it appears that psychologically close vs. distant construals of a goal not only affect the extent to which desirability or feasibility are considered; rather, psychologically distant construals may also make a goal seem more desirable.

Another mode of thought that affects a person's readiness to reflect on the desirability of a goal is counterfactual thinking (Epstude & Roese, 2008; McCrea, 2008). Failing to reach a set goal (e.g., not doing well in a mid-term exam where one set out to receive an A) often triggers thoughts such as: "If only I had studied harder, I would have done better on the mid-term exam!" Such counterfactual thought in turn triggers thoughts about the desirability of studying harder for the class, potentially leading to the goal to study harder for this class in the future. But when it comes to adjusting one's goals to internal and external demands, counterfactual thinking is not the only form of thinking attentively, repetitively, or frequently about one's self and one's world. A summary article by Watkins (2008) points out that there are many others: for instance, rumination (or brooding on negative stimuli), worry, mind wandering, chronic self-consciousness, and mental simulation. Each of these forms of thinking may produce a differential readiness to consider desirability of potential goals.

It is not only mode of thought that influences desirability considerations and assessments; emotional states also play a role. Traditional analyses of emotion (e.g., Frijda, 1986; Russell, 2003) emphasize the potential of emotions to elicit behavior directly. For example, fear produces fight or flight, or disgust leads to rejection. Recently, Baumeister, Vohs, DeWall, and Zhang (2007) have argued that behaviors can produce emotional outcomes. For example, stealing may lead to feelings of guilt. By cognitively anticipating such outcome emotions, people can learn about the desirability of performing the respective behavior (e.g., pride may signal high desirability). As a consequence, when people deliberate whether to perform a certain behavior, they may anticipate relevant

outcome emotions. These anticipated emotions in turn may provide valuable feedback on whether to set the goal to perform the behavior or not.

Different Ways of Reflecting on the Desirability of a Potential Goal

Thinking about the positive consequences of having attained a potential goal can be done in different ways, and these different ways may be differentially effective in turning anticipated positive consequences into commitments to actually reach this potential goal. The *theory of fantasy realization* specifies three relevant ways of thinking (Oettingen, 2000): mental contrasting, indulging, and dwelling. In mental contrasting, people first imagine the fulfilment of a potential goal (e.g., the positive consequences of giving a good presentation at a conference) and then reflect on the present reality that stands in the way of attaining the desired future (e.g., evaluation anxiety). Mental contrasting is a problem-solving strategy that allows people to recognize that they have not yet fulfilled their wish, and that they need to take action in order to achieve the desired future. As a consequence, expectations of attaining the desired future become activated and determine a person's goal commitment and subsequent striving to attain the desired future. When perceived expectations of success are high, people will actively commit to realizing the desired future; when expectations of success are low people will refrain from doing so, and thus they will venture on alternative potential goals (i.e., desired futures). In this way, mental contrasting helps people discriminate between feasible and unfeasible goals and promotes motivationally smart goal setting (i.e., people invest in attractive goals that they can attain; summary by Oettingen & Stephens, 2009).

The theory of fantasy realization specifies two further ways of thinking about potential goals. People may engage either in indulging (envisioning only the positive

consequences of goal attainment) or in dwelling (reflecting only on the present negative reality). Neither indulging nor dwelling directs the individual's attention to the discrepancy between future and reality, and thus the individual fails to recognize that actions (making responses) are necessary to achieve the desired future. Therefore, expectations of success do not become activated, and goal setting does not reflect the perceived likelihood of reaching the desired future. Individuals who indulge and dwell show a medium level of goal commitment, even though the resource-efficient strategy to follow would be no engagement in the case of low expectations of success, and full engagement in the case of high expectations of success. For example, when it comes to the goal of giving a good presentation at a conference, both indulging and dwelling will lead to moderate preparation, regardless of whether a successful performance is perceived as within one's reach or as hardly possible.

Various experiments support these claims (e.g., Oettingen, 2000; Oettingen, Pak, & Schnetter, 2001; Oettingen, Mayer, Sevincer et al., 2009; Oettingen, Mayer, Thorpe et al., 2005; Oettingen, Stephens, Mayer, & Brinkmann, 2010). In one study (Oettingen et al., 2001, Study 4), first-year students enrolled in a vocational school for computer programming indicated their expectations of excelling in mathematics, and were assigned to mentally contrast, indulge, or dwell about doing so. As dependant variables, participants indicated how energized they felt with respect to excelling in math, and two weeks later participants' teachers reported how much effort each student had invested over the interim and provided each student with a grade for that time period. As predicted, only in the mental contrasting condition did the students feel energized, exert effort, and earn grades based upon their expectations of success. Those with high

expectations of success felt the most energized, invested the most effort, and received the highest course grades; those with low expectations of success felt the least energized, invested the least effort, and received the lowest course grades. To the contrary, participants in both the indulging and dwelling conditions showed moderate goal commitment, independent of their expectations of success.

A variety of studies pertaining to different life domains replicated this pattern of results, for example, experiments on studying abroad, acquiring a second language, getting to know an attractive stranger, finding a balance between work and family life, self-improvement, and idiosyncratic interpersonal wishes of great importance. Furthermore, strength of goal commitment was assessed by cognitive (e.g., making plans), affective (e.g., feelings of frustration), motivational (e.g., feelings of energization), and behavioral (e.g., amount of invested effort) indicators. These indicators were measured via self-report or observations, either directly after the experiment or weeks later. All of these studies evidenced the same patterns of results: given high expectations of success, participants in the mental contrasting group showed the strongest goal commitment; given low expectations, mental contrasting participants showed the weakest goal commitment. Participants who indulged in positive images about the future or dwelled on negative images of reality showed medium commitment no matter whether expectations of success were high or low. It is important to note that the outcomes of mental contrasting do not occur as a result of changes in the level of expectations (feasibility) or incentive valence (desirability).

The mediating processes of mental contrasting pertain to energization (Oettingen, Mayer, Sevincer, et al., 2009). Specifically, mentally contrasting a desired future with

obstacles of present reality leads to energization, which in turn creates goal commitments strong enough to lead to effective goal striving and successful goal attainment. Mediating effects of energization on goal commitment are shown on physiological indicators of energization (i.e., systolic blood pressure) as well as on experiential indicators (self-reports of feeling energized). Mental contrasting also spurs planning, a known cognitive mediator between expectations of success and goal commitment (Oettingen & Stephens, 2009). Moreover, the effects of mental contrasting result in changes of implicit cognition. A series of studies show that when expectations of success are high, mental contrasting establishes strong mental associations between the desired future and the present reality that is now perceived as an obstacle to attaining the future; when expectations are low, mental contrasting leads to weak mental associations. Relevant control groups produce mental associations of moderate strength that are independent of expectations. Importantly, in the mental contrasting group, the strength of associations mediate the link between expectations and goal commitment (Kappes & Oettingen, 2010).

Mental contrasting, as it is a problem-solving strategy, necessitates heightened cognitive activity. A recent experiment attesting to this idea used continuous magnetoencephalography (MEG), a brain imaging technique measuring magnetic fields produced by electrical activity in the brain (Achtziger, Fehr, Oettingen, Gollwitzer, & Rockstroh, 2008). Mental contrasting, contrary to indulging or simply resting, produced heightened brain activity in areas associated with working memory, episodic memory, intention maintenance, action preparation, and vivid visualization. That is, mental contrasting implies vividly imagining a desired future, anticipating hindrances to

realizing this future, and making plans on how to overcome these obstacles. The brain activity associated with indulging, on the other hand, did not differ from resting.

These findings are in line with observational studies showing that sheer positive fantasies about the future predict low effort and success (Oettingen and Wadden, 1991; Oettingen & Mayer, 2002). For example, spontaneously indulging in positive fantasies about future weight loss predicted low success in actual weight loss (after four months and one years; Oettingen & Wadden, 1991). Moreover, indulging in positive fantasies (measured by valence and frequency) predicted weak goal commitments (as assessed by efforts to strive for the goal) in areas of academic achievement (e.g., achieving a good grade in a psychology class), professional achievement (e.g., finding a job after graduation), interpersonal relations (e.g., finding a romantic partner), and health (e.g., recovering from hip surgery). Importantly, the findings prevailed regardless of whether the spontaneously produced positive fantasies pertained to the desired outcome or to the process of achieving that outcome. Also, goal commitment in these studies was assessed at a range of two weeks to two years after the assessment of the spontaneously-produced positive future fantasies.

At first sight, the reported findings seem to be in contrast to research observing facilitating effects of positive affect on performance in executive function tasks (Dreisbach & Goschke, 2004; Gable & Harmon-Jones, 2008; Kazen & Kuhl, 2005). However, these facilitating effects evidence in individuals who perform these tasks while being in a positive affective state. Note that the studies reported in the previous paragraph, assessed performance long after the potential hype produced by the positive affective state had vanished. Therefore, performance was a function of goal commitment,

and a binding goal commitment cannot emerge when people indulge in their wishes and fantasies about the future.

A further strategy of reflecting about the desirability of a potential goal is suggested by the *mindset theory of action phases* (Heckhausen & Gollwitzer, 1987; Gollwitzer, 1990, in press). This theory maintains that setting goals means selecting one of one's many wishes and deciding to realize it. The theory posits that there are multiple stages of goal pursuit, called action phases, which people need to successfully navigate to attain a goal: the predecision, the preaction, the action, and the post action phases. Each phase is characterized by a distinct task that must be accomplished, and the degree of involvement with each of these tasks produces a typical mindset that facilitates task completion (e.g., a deliberative mindset when the pros and cons of choosing a goal at hand are weighed; an implemental mindset when the individual steps of goal striving are planned according to when, where, and how they are to be executed). In the mindset theory of action phases, setting oneself a goal is conceived of as the end product of navigating the predecisional phase.

Assuming that people generally entertain more wishes than they have time or means to realize, they face the task of having to decide between the wishes in order to accomplish at least some of them. The deliberation of desirability (weighing the pros and cons of goal attainment) and feasibility (estimating the likelihood of goal attainment), in this order, guides this decision. The theory assumes that whenever people start to deliberate their wishes, cognitive procedures become activated that allow for open-minded processing of available information (Fujita, Oettingen, & Gollwitzer, 2007), tune people towards processing information related to the desirability and feasibility of their

wishes (Gollwitzer, Heckhausen, & Steller, 1990), and allow for even-handed (impartial analysis of pros and cons) and objective (realistic analysis of likelihoods) analysis of this information (Armor & Taylor, 2003; Bayer & Gollwitzer, 2005; Gagné & Lydon, 2001a,b; Gollwitzer & Kinney, 1989; Taylor & Gollwitzer, 1995).

Mindset theory assumes that the transition from the predecisional phase to the preaction phase takes the form of a resolution that leads to a determination to act. Through this resolution the desired end state, specified by the wish and explicated by deliberation of positive and negative consequences of wish fulfillment, becomes a goal that the individual feels committed to achieve. According to mindset theory, the desirability and feasibility of a wish needs to be fully and completely deliberated before people can move from indecisiveness to decisiveness. As a consequence, when people feel that they have deliberated enough, they should be able to justify to themselves that they can now make such a move (i.e., “cross the Rubicon”). To test this hypothesis, Gollwitzer, Heckhausen, and Ratajczak (1989) had as-yet-undecided people intensively deliberate the possible pros and cons of an unresolved personal problem. Even though immediately thereafter these participants were still observed to be very undecided, when these participants were contacted again after one week had passed their readiness to make a decision had significantly increased.

But what if *incentives are activated outside of awareness*? Can this also promote the selection of goals? Recent research by Aarts and colleagues (for a review see Veltkamp, Aarts, & Custers, 2009) suggests that this should be the case. In their research they studied nonconscious goal activation rather than conscious goal selection and observed that both the goal of high performance (exertion) and the incentive attached to

that goal could be manipulated nonconsciously. Importantly, participants subliminally primed with the goal of exertion outperformed a control group in a hand-grip squeezing task, but those primed simultaneously with both the exertion goal and positive stimuli performed the best of all (Aarts, Custers, & Marien, 2008). Moreover, experimental work by Custers and Aarts (2005, 2007) observed that conditioning a positive affective response to the name of a particular goal increases the chances the individual will pursue that goal when primed outside of awareness. All of these studies provide support for the assumption that the nonconscious activation of a goal is not only facilitated when a person is high on the respective chronic motive (as reported above); goal priming also receives a boost when the goal is linked to positive incentives – even if the individual is not aware of these links.

The Role of Motives and Incentives During Goal Striving

So far we have analyzed the role of motives and incentives with respect to selecting goals. But what is the role of motives and incentives when it comes to successfully striving for chosen goals? As the strength of a person's motive should affect the commitment to a respective goal, strong motives can be assumed to facilitate goal attainment via strengthening respective goal commitments. The same can be assumed for powerful as compared to weak incentives. Again, the former should help to come up with strong goal commitments which in turn facilitate goal attainment. A more interesting question pertains to the impact of deliberation of a goal's desirability after one has chosen a goal. Will such renewed deliberation enhance or hinder goal striving?

Deliberation of Desirability for Chosen as Compared to Nonchosen Goals

Deliberation of desirability has in the past been conceptually attached to the predecision action phase (for a review see Gollwitzer & Bayer, 1999; Gollwitzer, in press). However, from a pragmatic point of view people can also be asked to deliberate a goal's desirability once a goal decision has been made. What are the consequences of engaging in pre- vs. postdecisional deliberation? Recent research has addressed this issue by asking whether predecisional versus postdecisional deliberation differentially affects people's commitment to the goal at hand (Nenkov & Gollwitzer, 2010).

As reported above, past research has provided some insights into the effects of predecisional deliberation on goal commitment. Gollwitzer, Heckhausen, and Ratajczak (1990) found that asking undecided participants to deliberate on potential change goals (e.g., to switch one's major) has the immediate effect of making participants even more hesitant to commit to making the change decision in question. These findings suggest that deliberation might lower goal commitment for people who are still in the predecisional phase, that is, who are not yet decided to strive for the goal at hand.

Note that in this Gollwitzer et al. (1990) study, the assigned deliberation matched the predecisional action phase in which participants were still located. Gagné and Lydon (2001a), on the other hand, looked into the effects of a mismatching deliberation on goal commitment (i.e., postdecisional individuals were asked to engage in deliberation). Their results revealed that asking people to deliberate on goals related to a relationship that they were already committed to made them bolster their relationship illusions. Gagné and Lydon explained this finding by suggesting that the doubt and uncertainty associated with deliberation may pose a threat to individuals who are already committed to a relationship, which prompts them to defend against such threat by exaggerating their partner's

superiority and bolstering their positive illusions. Because relationship illusions are indicative of increased commitment to the relationship (Gagné & Lydon, 2001b), these findings suggest that postdecisional deliberation may have a strengthening effect on goal commitment.

Nenkov and Gollwitzer (2010) therefore proposed that a person's being pre- or postdecisional with respect to a given goal might be a potential moderator of the deliberation–goal commitment relationship. Deliberating on the pros and cons of pursuing or not pursuing a goal should lower goal commitment when people are still predecisional (i.e., are undecided about pursuing the goal) but strengthen goal commitment when people have already decided to pursue the goal. This hypothesis is also in line with the mindset theory of action phases (Gollwitzer, 1990, in press), as predecisional individuals can be assumed to show a predilection for a deliberative mindset characterized by open-mindedness and impartiality, whereas postdecisional individuals should be characterized by a predilection for an implemental mindset characterized by closed-mindedness and partiality. Accordingly, predecisional people should become even more open-minded and impartial and thus more hesitant to commit to the goal in question, whereas postdecisional people should become even more closed-minded and partial in favor of the goal at hand and thus very determined to reach the goal. Current conceptions of goal commitment define this concept as the extent to which personal goals are associated with a strong sense of determination, with the willingness to invest effort, and with impatient striving for goal implementation (e.g., Hollenbeck, Willias, & Klein, 1989; Kruglanski et al., 2002; Oettingen, Pak, & Schnetter, 2001). Using different measures of goal commitment, Nenkov and Gollwitzer (2010) observed that

postdecisional deliberation that was requested by the experimenter led to an increase in goal commitment, whereas predecisional deliberation produced a decrease.

Deliberation of Desirability: Effects on Plan Formation and Plan Enactment

Gollwitzer (1999) has argued that people can enhance goal attainment by furnishing their goals with implementation intentions. In implementation intentions, people plan the when, where, and how of striving for a goal in an “If I encounter situation Y, then I will perform goal-directed response Z!” format. By pre-deciding how to act in response to a specific situation, implementation intentions delegate the control over the initiation of goal-directed responses to critical situational cues. Implementation intentions have been observed to facilitate coping with the typical problems of goal striving, such as failing to get started, getting derailed, not calling a halt to futile striving, and over-extending oneself (Gollwitzer & Sheeran, 2006). For instance, with respect to staying on track (not getting derailed), the implementation intention “If I hear or see commercials, then I will ignore them!” improved test-anxious students’ performance on a math exam which they completed as televised distractions appeared in a separate window on the same computer screen (Parks-Stamm, Gollwitzer, & Oettingen, 2010).

Mediators of the implementation intention effects pertain to the if-component and the then-component of an implementation intention. Making if-then plans (i.e., forming implementation intentions) heightens the state of activation of the mental representation of the specified cue in the if-component which ensures easy cognitive accessibility of this cue (e.g., Aarts, Dijksterhuis, & Midden, 1999; Achtziger, Bayer, & Gollwitzer, 2010; Webb & Sheeran, 2008). Second, implementation intentions forge a strong link between the anticipated situational cue specified in the if-component and the intended response in

the then-component (Webb & Sheeran, 2008), leading to the automation of response initiation. This automation is indicated by uncontrolled attention to the specified cues (Wieber & Sassenberg, 2006), immediate and efficient initiation of the goal-directed response (Aarts & Dijksterhuis, 2000; Brandstätter, Lengfelder, & Gollwitzer, 2001, Studies 3 and 4; Gollwitzer & Brandstätter, 1997, Study 3), and the redundancy of conscious intent at the moment of response initiation (Bayer, Achtziger, Gollwitzer, & Moskowitz, 2009).

In recent research, Wieber, Gollwitzer, Gawrilow, Odenhal, and Oettingen (2010) raised the question of whether reflecting on the positive consequences of the respective superordinate goal might help or undermine the formation and enactment of implementation intentions. With respect to implementation intention formation, the authors argue that when forming implementation intentions, people have to select situations that qualify as critical cues for action, and instrumental goal-directed responses, which they then link together by a conscious act of will in an if-then format. Consciously forging the specific if-then plan is thus the critical act by which action control is delegated to critical situational cues. Deliberating on the positive consequences of one's goal while a respective implementation intention is formed directs attention away from encoding the if-then link, which should result in an impaired automation of action control by the implementation intention.

In line with this reasoning, research on prospective memory found that encoding prospective memory tasks suffers from resource-demanding tasks that direct attention away (Einstein, Smith, McDaniel, & Shaw, 1997; McDaniel, Robinson-Riegler, & Einstein, 1998). For example, participants were less likely to respond to selected targets

(events, points in time) when they were engaged in an attention-demanding digit-monitoring task during the encoding of the prospective memory instructions (Einstein et al., 1997). Similarly, a reduced efficiency of encoding as observed in participants of old age has been shown to result in higher amounts of missed prospective memory responses (Einstein et al., 1997; Zöllig, Martin, & Kliegel, 2010).

Indeed, when Wieber et al. (2010) asked participants to extend the if-then format of their implementation intentions by a why-component (resulting in the deliberation of positive consequences of goal attainment), the attainment of the respective goal was reduced. This was true no matter whether the goal pertained to performing well on an analytic reasoning test or to reducing one's body weight in a longitudinal field study on dieting. Even though in both studies goal attainment was enhanced (as compared to a mere goal intention control group) by common if-then implementation intentions, if-then-why implementation intentions failed to do so.

In two further studies the authors analyzed whether the enactment of implementation intentions is also affected by reflecting on goal desirability. The authors argue that deliberation on the why of a goal can be expected to establish a reflective information processing mode (deliberative mindset, see above), and that such a mindset may hamper the smooth running off of automatic processes. As implementation intentions achieve their effects on automatic processes, implementation intention enactment should suffer. Evidence that deliberation can impair automated action control is provided by various lines of research, as for instance in research on the “choking under pressure” phenomenon, where decrements in performance relative to one's level of skill occur under circumstances that increase the perceived importance of good performance

(e.g., Baumeister & Showers, 1986; Beilock, Bertenthal, Hoerger, & Carr, 2008; Hill, Hanton, Matthews, & Fleming, 2010; Lewis & Linder, 1997). To give an example, participants who had proceduralized their golf putting skill under conditions of low performance pressure underperformed under high performance pressure as operationalized by video-taping them (Beilock & Carr, 2001). According to explicit monitoring theories choking under pressure results from consciously monitoring the execution of well-learned sensorimotor skills as it disrupts the smooth execution of skills that do not require conscious step-by-step control (Baumeister, 1984). More specifically, conscious monitoring is assumed to break down an integrated control structure into a sequence of smaller, independent units that must be activated and run separately (Masters, 1992). This process results in slowed performance and in increased error rates. Further evidence that deliberation impairs the effectiveness of automatic processes is generated by research on the effects of analytic thought on decision-making. Analyzing reasons for a decision was found to reduce post-decision satisfaction (Dijksterhuis & van Olden, 2006), consistency with one's attitudes (Wilson, Dunn, Bybee, Hyman, & Rotondo, 1984), and accuracy assessed by using objective criteria (Dijksterhuis, Bos, Nordgren, & van Baaren, 2006; McMackin & Slovic, 2000).

Together, the findings on the disruption of automatic processes by conscious reflective thinking as derived from quite different fields of research suggest that a deliberative mindset originating from reflecting on the desirability of a potential goal should disrupt automatic action control by implementation intentions. Wieber et al. (2010) found support for this hypothesis in two studies that first created a deliberative mindset by reflecting on the desirability of a potential goal and then had participants

strive for assigned task goals that were either furnished with implementation intentions or not (i.e., holding a handgrip closed as long as possible in one of the studies; performing a go/no-go task as fast and accurate as possible in the other study). The authors observed that the created deliberative mindset completely abolished the commonly observed beneficial effects of implementation intentions on goal attainment. In other words, deliberative mindsets created by desirability reflections seem to disrupt the strategic automation of action control by implementation intentions.

Striving for a Goal in the Presence of Positive/Negative Incentives

Assuming that the presence of positive/negative incentives affects a person's mood, research on the effects of affective states on goal striving are relevant to the understanding of how the presence of incentives affects ongoing goal striving. For instance, Tice, Bratislavsky, and Baumeister (2001) focused on negative affect and observed that feeling emotionally distraught (i.e., having been asked to imagine that one has caused a traffic accident that killed a child) makes it difficult to follow through with goals of not eating unhealthy food or delaying gratification to attain better long-term rewards. Moreover, this emotionally negative state also intensifies procrastination: for example, people did not use the time provided to study for an upcoming test. In all of these studies it appeared that the reason people did not act on their goals was simple; they felt that inaction would alleviate their negative emotional states.

Positive affect, on the other hand, has been observed to facilitate goal striving. In early childhood (2 to 4 years of age), positive emotionality in children's interactions with their mothers facilitates the difficult self-regulation required for tasks like slowing down, lowering one's voice, or delaying the unwrapping of a received gift. Research with adults

has focused on how positive affect achieves this positive effect on task goal attainment. Kazen and Kuhl (2005; Kuhl & Kazen, 1999) argue that even though decreases in positive affect make it easier to maintain a goal intention in working memory, it takes an increase in positive affect to facilitate the successful behavioral implementation of difficult intentions (e.g., to do well on the Stroop task). Gable and Harmon-Jones (2008) observed that positive affect induced by imagining rewards (such as tasty desserts) reduced the breadth of the focus of attention, which facilitates emphasizing specific action tendencies and thus tenacious goal striving.

But positive affect may promote goal striving not only via certain cognitive processes, it may do so in addition by causing changes in motivation. At least this is suggested by energization theory (Brehm & Self, 1989; Wright, 1996) which argues that people show a heightened willingness to exert reactive effort increase in the face of difficulties when the incentive value of task completion is high. Empirical tests of the theory have varied incentive value by offering high or low rewards for task completion, making high rewards more or less likely, or by describing the task as diagnostic of an important scholastic skill or not (Gendolla & Richter, 2006). Effort mobilization is usually assessed by cardiovascular responses (i.e., heart rate and systolic blood pressure). In general, the presence of high incentives was found to make people exert additional effort to meet the goal at hand even when task difficulty moved from medium to high. According to the theory, high incentives raise the level of potential motivation, so that the amount of effort a person is willing to exert is expanded. Energization theory has been used to understand the differences between men and women in effort on sex-typed tasks, and to explore the effects of private versus public performance conditions on effort

(Wright, Tunstall, Williams, Goodwin, & Harmon-Jones, 1995; Wright, Murray, Storey, & Williams, 1997). The important message of these findings is that people can facilitate energization in the face of difficulties by adding incentives to task performance.

Given that positive affect was found to foster performance on some tasks (e.g., the Stroop) this does not imply that positive affect is beneficial to goal striving in all kinds of tasks. Complex and ill-defined tasks require that people anticipate potential obstacles and hindrances. This is easier when people experience negative affect. Not surprisingly then, for complex and ill-defined tasks positive affect was found to be a hindrance rather than a facilitator of using strategies to set and attain the goal (Barry, Oettingen, Mayer, & Maglio, 2010) and actual goal attainment (Markman, Lindberg, Kray, & Galinsky, 2007; Oettingen & Mayer, 2002; Taylor, Pham, Rivkin, & Armor, 1998). And people are found to prefer to be in negative emotional states if those states better facilitate goal striving: soldiers entering battle or football players during a game prefer an angry, aggressive (negative) mood rather than a relaxed, positive mood (Tamir, 2009).

Finally, the most striking demonstration that the presence of positive/negative incentives matters when it comes to successful goal striving comes from research where incentives are presented subliminally while the research participant works on an assigned task goal. The task goals studied relate to performing well on various executive function tasks (e.g., the Stroop, the stop signal task, the arrow flanker task, or exerted effort). As it turned out in various recent studies, subliminally presented incentives (e.g., coins) managed to affect performance on these tasks (e.g., Schmidt et al., 2010; Pessiglione et al., 2007). As it seems safe to assume that executive functions (such as response inhibition, task switching, focusing attention, conflict resolution, effort expenditure) are

crucial for the success of our daily goal strivings, it will be an important objective for future research to learn which of these functions are positively affected by subliminally presented incentives and which are hampered (e.g., Bijleveld, Custers, & Aarts, 2010); and analogously, which of them benefit from incentives that are presented supraliminally (i.e., can be consciously processed) and which are handicapped.

Conclusion

The present chapter explicates the concepts of needs (motives), incentives, and goals by turning to the history of the psychology of motivation. It then analyzes whether needs qualify as determinants of goal choice. It is observed that various lines of research attest a guiding function to needs when it comes to the selection of goals; needs are thought to determine the type (content) of goals that are selected. Most interestingly, needs may even affect the activation of goals outside of awareness in the sense that need-congruent goal activation is more stable (i.e., the heightened activation level is more stable over time). Similarly, incentives defined as the anticipated consequences of goal attainment are also assumed to have a guiding function in goal selection. However, recent research shows that the way in which incentives are thought about makes a crucial difference; this not only applies to the comprehensiveness of a person's thinking about incentives, it also pertains to the mode of thought by which incentives are addressed (e.g., indulging vs. mental contrasting). Again, recent research shows that subliminally presented incentives also manage to affect goal choice.

Finally, we suggest that needs and incentives play an important role when it comes to implementing chosen goals, simply because strong needs and powerful incentives lead to strong commitments to the chosen goal. Most interestingly, recent

research has also analyzed how goal implementation is affected by the presence of positive/negative incentives when actual goal striving is taking place. It is still an open question what kind of (task) goals benefit from the presence of positive or negative incentives, and whether this depends on the person's awareness or unawareness of their presence.

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