

Do People Differentiate Between Intrinsic and Extrinsic Goals for Physical Activity?

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The distinction between intrinsic and extrinsic goals, and between goal pursuit for intrinsically and extrinsically motivated reasons, is a central premise of self-determination theory. Proponents of the theory have proposed that the pursuit of intrinsic goals and intrinsically motivated goal striving each predict adaptive psychological and behavioral outcomes relative to the pursuit of extrinsic goals and extrinsically motivated goal striving. Despite evidence to support these predictions, research has not explored whether individuals naturally differentiate between intrinsic and extrinsic goals. Two studies tested whether people make this differentiation when recalling goals for leisure-time physical activity. Using memory-recall methods, participants in Study 1 were asked to freely generate physical activity goals. A subsample ($N = 43$) was asked to code their freely generated goals as intrinsic or extrinsic. In Study 2, participants were asked to recall intrinsic and extrinsic goals after making a decision regarding their future physical activity. Results of these studies revealed that individuals' goal generation and recall exhibited significant clustering by goal type. Participants encountered some difficulties when explicitly coding goals. Findings support self-determination theory and indicate that individuals discriminate between intrinsic and extrinsic goals.

Keywords: motivation, self-determination theory, goals, autonomy, exercise

Physical activity has been implicated as a significant factor in health promotion and disease prevention (e.g., Astrup, 2001; Bassuk & Manson, 2005; Schmitz et al., 2005). Warburton, Nicol, and Bredin (2006) presented robust evidence for the efficacy of regular physical activity in both the primary and secondary prevention of major chronic diseases, including cardiovascular disease, diabetes, cancer, obesity, depression, hypertension, and osteoporosis. In addition, there is evidence that regular participation in physical activity confers substantial mental and physical health benefits (Penedo & Dahn, 2005). Studies have also documented the value of moderate and high levels of physical activity in substantially extending life expectancy (Franco et al., 2005; Warburton et al., 2006).

However, despite the clear benefits of regular physical activity for a range of health and disease outcomes, physical inactivity remains a pervasive problem.

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For example, research examining levels of physical activity and inactivity in adults and children in the United States revealed that only 27.7% of adults met recommended levels of either moderate or vigorous physical activity, with almost 30% reporting no regular physical activity outside a work context (Pratt, Macera, & Blanton, 1999). Similarly, Livingstone, Robson, Wallace, and McKinley (2003) reviewed recent evidence regarding levels of physical activity in adults and reported that up to 40% of US adults are sedentary in their leisure time. Adults in England exhibit comparable levels of inactivity; a study of 15,423 adults showed that less than one-third participated in adequate amounts of physical activity to accrue health benefits, and these findings held when analyses were restricted to currently “healthy” adults (Harrison, McElduff, & Edwards, 2006). Physical inactivity appears to be equally ubiquitous in children. A study of 5595 children in Southwest England reported that only 2.5% of children met current internationally endorsed recommended levels of physical activity (Riddoch et al., 2007).

Social psychological theories have been frequently employed to understand the motivational and self-regulatory factors that affect physical activity behavior (e.g., Chatzisarantis, Hagger, Smith & Phoenix, 2004; Hagger, Wood, Stiff, & Chatzisarantis, 2009; McLachlan & Hagger, 2011; Orbell, Hagger, Brown & Tidy, 2006; Schwarzer, 2008). Self-determination theory (SDT, Deci & Ryan, 1985, 2000), in particular, has been applied to develop an understanding of physical inactivity and to provide methods to enhance physical activity levels through intervention. Self-determination theory is an organismic dialectic theory of human motivation that has been successfully employed to understand behavioral engagement and persistence in varied applied domains such as health, education, and occupational and organizational settings. In SDT, behavior is viewed as driven by three fundamental psychological needs: the needs for competence, autonomy, and relatedness. The need for competence describes individuals’ drive to function effectively in their environment, the need for autonomy relates to the desire to experience oneself as the initiator and regulator of one’s actions, and the need for relatedness refers to individuals’ propensity to form close and fulfilling interpersonal relationships. Humans are portrayed in SDT as active agents in the pursuit of fulfillment of these needs (Deci & Ryan, 2000).

With regard to the needs to experience autonomy and competence, the theory broadly distinguishes between two types of behavioral regulation: autonomous and controlled motivation. Autonomous motivation comprises three qualitatively different forms of self-determined behavioral regulation (intrinsic motivation, integrated regulation, and identified regulation) and refers to participating in a behavior for the enjoyment, satisfaction, and interest inherent in the behavior, or for personally endorsed or valued outcomes. In contrast, controlled motivation, comprising extrinsic motivation and introjected regulation, describes participation in a behavior for reasons that are separable from the behavior itself such as gaining approval from others, avoiding guilt or shame, or obtaining contingent self-worth. Deci and Ryan (1985) argued that autonomously motivated behaviors are driven by a desire to fulfill psychological needs for autonomy and competence. While autonomous forms of motivation are associated with adaptive psychological and behavioral outcomes such as higher behavioral quality, greater persistence, more effective learning, better health and psychological well-being, concentration, positive affect, and adaptive behavioral, cognitive, and physical self-evaluative patterns

(e.g., Black & Deci, 2000; Fortier, Sweet, O'Sullivan, & Williams, 2007; Hagger, Chatzisarantis, & Biddle, 2002; Kasser & Ryan, 1996; Pelletier, Dion, Slovic-D'Angelo, & Reid, 2004; Pelletier, Fortier, Vallerand, & Briere, 2001; Ryan & Deci, 2000; Standage, Duda & Ntoumanis, 2005; Thøgersen-Ntoumani & Ntoumanis, 2006), controlled motivation tends to be associated with behavioral persistence only so long as the external contingency, such as rewards or reinforcements, is present and is associated with less adaptive outcomes such as boredom, superficial learning, and lower quality of behavior (e.g., Deci & Ryan, 1985; Ntoumanis, 2001; Wang & Guthrie, 2004). This is because an individual views the behavior as emanating from outside the self and therefore feels pressured and coerced into engaging in the behavior by external forces.

Meta-analyses have supported the importance of autonomous motivation relative to controlled motivation. For instance, Patall, Cooper, and Robinson (2008) analyzed 41 studies examining the effects of choice, an environmental support for the prototypical form of self-determined motivation, intrinsic motivation, on intrinsic motivation and associated outcomes. The provision of choice enhanced intrinsic motivation, effort, perceived competence, and task performance. Similarly, meta-analyses have identified autonomous forms of motivation as significant predictors of physical activity behavior (Chatzisarantis, Hagger, Biddle, Smith, & Wang, 2003; Hagger & Chatzisarantis, 2009). The importance of employing a self-determination theory perspective to predict physical activity behavior is becoming increasingly endorsed (Edmunds, Ntoumanis, & Duda, 2006; Landry & Solomon, 2004) and the theory has been used in the development of many behavior-change interventions, including those directed at physical activity (e.g., Chatzisarantis & Hagger, 2009; Edmunds, Ntoumanis, & Duda, 2008).

Self-Determined Motivation and Goals

Within SDT, a conceptual distinction is made between motivation and goal content. Whereas motivation focuses on the “why” or reasons underlying behavioral engagement, goal content refers to the “what” or objective of goal striving. Research has examined the *types* of goal that people pursue within the context of SDT. Kasser and Ryan (1996) distinguished between intrinsic and extrinsic goals. Intrinsic goals have been defined as those that are inherently rewarding and fulfilling to pursue, through the satisfaction of the three psychological needs. Such goals contribute to the development of personal interests and aspirations, and include goals for promoting social relationships, community contribution, and personal growth. In contrast, extrinsic goals have an outward focus and goal striving is directed toward outcomes such as fame, wealth, and a desirable image. Goals have been differentially associated with types of motivation from SDT. For example, in the domain of physical activity, Ingledew and Markland (2008) showed that appearance and weight goals were positively associated with extrinsic motivation and negatively associated with exercise participation, while health and fitness motives were positively related to self-determined motivation and physical activity participation. These authors also reported that social engagement goals were associated with greater self-determined motivation. Similarly, Gillison, Standage, and Skevington (2006) found that intrinsic goals positively predicted self-determined motivation, which led to adaptive quality of life and behavioral outcomes. McLachlan and Hagger (2010) have also shown

that chronically accessible appearance and weight loss-related goals in physical activity are associated with less self-determined forms of motivation. Goals are therefore of crucial importance in determining the type of motivation underlying behavior (Gillison, et al., 2006). However, there is also evidence to suggest that goals and motivation are distinct constructs in SDT and predict unique variance in psychological and behavioral outcomes. For instance, Sheldon, Ryan, Deci, and Kasser (2004) showed that relative extrinsic goal content predicted variance in well-being that was not reducible to the motivation underlying these goals. Goal content has received increased attention in physical activity research over recent years. For example, Sebire, Standage, and Vansteenkiste (2009) reported that relative intrinsic goal content positively predicted a number of adaptive psychological outcomes independent of the effects of participants' self-determined motivation.

A number of studies both within and outside the physical activity context have demonstrated the differential effects of intrinsic and extrinsic goals on psychological and behavioral outcomes with intrinsic goals conferring advantages such as psychological need satisfaction, persistence, learning, achievement, reduced anxiety, and well-being (e.g., Sebire et al., 2009; Vansteenkiste, Simons, Lens, Sheldon, & Deci, 2004a; Vansteenkiste, Simons, Soenens, & Lens, 2004b). Research has also indicated that SDT-based goal framing manipulations can be used to promote adaptive psychological and behavioral outcomes. For instance, Vansteenkiste and colleagues (2004a) showed that framing tasks in terms of intrinsic goals, such as personal growth and health, resulted in deeper processing of learning material, higher test performance, and greater behavioral persistence than was observed with extrinsic goal framing. Such research has therefore led to recommendations that behavior change interventions should target goal content in addition to focusing on motivation. In the physical activity context, researchers have suggested that exercisers and exercise practitioners focus on the explicit content of exercise goals and promote intrinsic relative to extrinsic goal pursuit (e.g., Gillison et al., 2006; Sebire et al., 2009). Notwithstanding this research, no investigation to date has validated the distinction between intrinsic and extrinsic goals by exploring whether individuals *can* and *do* actively differentiate between these goal types. Although Vansteenkiste and colleagues' findings implied that people can distinguish between these goal types, their investigation did not provide evidence that individuals exhibit a tendency or propensity to make this distinction. The current investigation therefore assessed whether individuals naturally discriminate between intrinsic and extrinsic goals in the physical activity domain, to validate the conceptual distinction upon which SDT-derived goal framing manipulations are based (e.g., Vansteenkiste et al., 2004a). Methods to address this issue were adopted from research in the fields of attitudes and memory.

Clustering Methods

The present studies have been based closely on the methodology of Trafimow and Sheeran (1998) and were informed by previous studies examining distinctions between various theoretical constructs in social psychology, including behavioral and normative beliefs, and attitudes and perceived control (e.g., Trafimow & Duran, 1998; Trafimow & Fishbein, 1995). The clustering procedure used to analyze the data was based on previous free recall research (e.g., Roenker, Thompson, &

Brown, 1971). Both studies also used the spontaneous generation paradigm used by Higgins and colleagues in their research on construct accessibility (Higgins & Brendl, 1995; Higgins, King, & Mavin, 1982).

As an example of this approach, Trafimow and Sheeran (1998) carried out a series of experiments to determine whether people actively distinguish between the cognitive and affective belief components of attitudes. The rationale underlying the experiments was that if a person has to make a decision regarding an attitude object, the decision is likely to be easier if their beliefs regarding the attitude object relate to the same attitudinal dimension (i.e., affective beliefs with other affective beliefs and cognitive beliefs with other cognitive beliefs) than if they relate to different dimensions. Thus people should be more inclined to consider affective beliefs in relation to other affective beliefs and cognitive beliefs in relation to other cognitive beliefs than to make comparisons between affective and cognitive beliefs in relation to a behavioral decision. It therefore follows that more, and stronger, associations should be formed within belief type than between affective and cognitive beliefs. This notion was termed the *associative hypothesis* (Trafimow & Sheeran, 1998), as associations were predicted between beliefs that relate to each other in the process of making a behavioral decision. Trafimow and Sheeran argued that such processing would be cognitively efficient, as considering each set of beliefs together should lead to a general concept regarding affective aspects of an object or behavior and a general concept regarding cognitive aspects of an object or behavior. Such concepts can then be stored for future use in decision making rather than processing a large set of beliefs for each dimension on every occasion necessitating a decision. Trafimow and Sheeran (1998) therefore argued that the clustering of self-generated and recalled beliefs regarding cognitive and affective dimensions of an object or behavior would support the associative hypothesis and the general distinction between cognitive and affective components of attitude.

The aforementioned experiments showed that people do form more associations between beliefs on the same attitude dimension than between beliefs on different dimensions. In one experiment, behavioral beliefs presented by the experimenter were recalled in clusters of cognitive and affective beliefs when participants were required to process the beliefs and make a behavioral decision. Clustering was computed through the use of the adjusted ratio of clustering (ARC) index developed by Roenker and colleagues (1971). A score of unity (1.00) on the ARC index is indicative of perfect clustering, while a score of zero indicates chance clustering and a minus score reflects below chance clustering. A further experiment showed that affective beliefs and cognitive beliefs for smoking behavior clustered together when participants were asked to list their own beliefs about this familiar behavior, regardless of a priming manipulation intended to encourage negative clustering of responses. The experiment also showed that participants' beliefs had not clustered by valence as ARC scores computed on the basis of valence did not differ significantly from zero in either the prime or no prime condition.

An additional study by Trafimow and Sheeran (1998) provided further evidence for the associative hypothesis and its generality across behaviors by asking participants to list their own beliefs about having unprotected sex the following weekend. In support of the associative hypothesis, the mean ARC score based on participants' own coding of their beliefs was significantly greater than zero, showing that cognitive and affective beliefs were clustered separately. Again, findings were

not attributable to difference in belief valence. Trafimow and Sheeran concluded that people can and do differentiate between cognitive and affective beliefs and that the process of making a behavioral decision prompts clustered associations between beliefs to develop. Finally, Trafimow and Duran (1998) employed similar methods to demonstrate the distinction between the attitude and perceived control constructs from the theory of planned behavior (TPB; Ajzen, 1991), and evidence of cognitive belief clustering has also been used to support the distinction between attitudes and subjective norms postulated by the TPB (Trafimow & Fishbein, 1995). In summary, findings from these studies lend robust converging evidence in support of the associative hypothesis, as significant clustering emerged when people listed and coded self-generated beliefs, even for a familiar behavior and with a priming manipulation intended to deter the hypothesized pattern of clustering.

The Present Investigation

The clustering method developed by Roenker and coworkers, recommended by Srull (1984) for use in person memory and social cognition and employed by Trafimow and colleagues (Trafimow & Duran, 1998; Trafimow & Fishbein, 1995; Trafimow & Sheeran, 1998), was adopted in the present research to explore whether people can and do differentiate between intrinsic and extrinsic goals in a health-related physical activity context. This research has furthered understanding of the motivational factors underpinning health-related physical activity and advanced knowledge of SDT by testing whether people tend to make the distinction between intrinsic and extrinsic goals. In the first study, participants were asked to freely list goals that they or others might strive for in physical activity, and a subsample was also asked to return to their lists to mark each goal with either an “I,” if they believed the goal to be driven by “intrinsic motivation,” or an “E” if they believed the goal to be driven by “extrinsic motivation.” Participants were provided with definitions of intrinsic and extrinsic motivation to aid their understanding of the terminology.¹ The second study employed a recall task to ascertain whether a list of physical activity goals presented to participants was recalled in clusters of intrinsic and extrinsic goals. It was hypothesized that self-generated and recalled goals for physical activity would be clustered according to goal type, and that participants would reliably code their self-generated goals as intrinsic or extrinsic.

Study Method

Participants. Participants were undergraduate students of the University of Nottingham, majoring in psychology ($N = 98$, 35 males, 63 females, $M_{\text{age}} = 19.81$, $SD = 2.38$).

Procedure. The study protocol followed the British Psychological Society and institutional guidelines for ethical practice, through obtaining informed consent from participants, informing them of their right to withdraw from the study at any time, and ensuring anonymity of the data. Data collection took place under quiet classroom conditions. Participants were provided with written instructions asking them to list all the goals that either they or others might strive to attain when participating in leisure-time physical activities and were provided with the examples of running, swimming, and playing active sports. At this stage, no participants were

made aware of the distinction between intrinsic and extrinsic goals. A randomly selected subsample of participants was then asked to return to their lists to mark each goal with either an “I,” if they believed the goal to be intrinsically motivated, or an “E,” if they believed the goal to be extrinsically motivated. Definitions of intrinsic and extrinsic motivation were provided. Intrinsic motivation was defined as “participating in the behavior for reasons of interest, enjoyment, or satisfaction” and extrinsic motivation was defined as “participating in a behavior for external rewards or outcomes, such as gaining approval from others.”

Two independent raters, both experts in SDT, then categorized each goal as either intrinsic or extrinsic. Consistent with SDT (Deci & Ryan, 1985, 2000) and previous research exploring intrinsic and extrinsic goals in physical activity (e.g., Gillison et al., 2006; Sebire, Standage, & Vansteenkiste, 2008), goals relating to fun, enjoyment, socializing, valued health-related outcomes, and achieving a healthy lifestyle were classed as intrinsic, while goals relating to weight loss, appearance, and externally based rewards such as social recognition were categorized as extrinsic. An interrater agreement level of 100% was observed.

Data Analysis. The adjusted ratio of clustering (ARC) index proposed by Roenker and colleagues (1971) was employed to determine whether goals were clustered by goal type. An ARC score represents the proportion of actual category repetitions above chance to the total possible category repetitions above chance. The ARC was selected over other indices of clustering for several reasons. First, the ARC identifies maximum clustering when the maximum amount of organization within the set of words has occurred. Second, the ARC has been shown to produce a consistent value of zero with random clustering across different total recall (Schmidt, 1997). Finally, the methods employed in the current paper were based closely on those of Trafimow and Sheeran (1998) and it was therefore deemed appropriate to employ the same clustering index as these authors. A score of one on the ARC index represents perfect clustering and a score of zero indicates chance clustering, i.e., random listing or recall of beliefs. Negative scores represent less than chance clustering. The following formula was used to compute ARC scores: $ARC = [R - E(R)] / [\max R - E(R)]$, where R represents total number of observed category repetitions, $\max R$ represents maximum possible number of category repetitions, and $E(R)$ represents expected (chance) number of category repetitions. The value for $E(R)$ is calculated by summing the squares of the number of items from each category, dividing this by the total number of items and subtracting 1.

Results

A list of the modal goals generated by participants is presented in Table 1. Examining the clustering of goals listed, 22 participants showed perfect clustering by goal type ($ARC = 1.00$). A prototypical list of self-generated goals was “lose weight, tone up, look attractive, be healthy, feel good.” A one-sample t test indicated that the mean cluster score ($M = .14$, $SD = .61$) differed significantly from chance clustering, $t(97) = 2.19$, $p < .05$, $d = 0.44$. Common errors in participants’ labeling of goals included categorizing goals relating to winning competitions ($n = 7$) and relieving boredom or preventing other distractions ($n = 8$) as intrinsic, and categorizing outcomes related to health and fitness ($n = 8$) and social interaction ($n = 11$) as extrinsic.

Table 1 The List of Physical Activity Goals Presented to Participants in Study 2, With Categorization by Goal Orientation

Goal Content	Goal Orientation
Physical fitness	Intrinsic
Weight loss	Extrinsic
Good health	Intrinsic
Physical attractiveness	Extrinsic
Enjoyment	Intrinsic
Toned body	Extrinsic
Social interaction	Intrinsic
Impress others	Extrinsic
Enhance self-esteem	Intrinsic
Win awards	Extrinsic
Develop friendships	Intrinsic
Satisfy competitive desires	Extrinsic
Reduce stress	Intrinsic
Relieve boredom	Extrinsic
Improve skills	Intrinsic
Build muscle	Extrinsic

Discussion

Results indicate that there was significant clustering of freely generated physical activity goals by goal type in these participants. The mean cluster score was positive and differed significantly from chance, suggesting that intrinsic and extrinsic goals were clustered together in participants' freely generated goal lists. These findings support individuals' capacity to make the broad distinction between intrinsic and extrinsic goals in a physical activity context and indicate stronger connections in memory between goals of the same type than goals of different types.

However, when participants were asked to return to their goal lists to explicitly code goals as either intrinsic or extrinsic, they encountered difficulties in reliably distinguishing between the goals. Errors in categorizing goals included labeling goals relating to winning competitions and relieving boredom or preventing other distractions as intrinsic. Although it is possible that the motivational regulations underlying these goals may differ between individuals, there is general consensus in the SDT literature that a focus on interpersonal competition is characteristic of extrinsic goal pursuit (e.g., Duriez, Vansteenkiste, Soenens, & De Witte, 2007; Gagné & Deci, 2005; Markland & Ingledew, 1997). Further, the relief of boredom is likely to represent an extrinsic goal, as this relates to the alleviation or avoidance of a negative affective state and not necessarily the seeking of fulfillment, challenge, or personal growth. Other errors included the erroneous categorization of outcomes related to health, fitness, and social interaction as extrinsic. Again, although it is

acknowledged that there may be individual differences in the exact motivations underlying these goals, previous research has indicated that both health and fitness-related and social interaction goals are intrinsic in nature (e.g., Sebire et al., 2009).

These findings suggest that although individuals may possess the capacity to distinguish between intrinsic and extrinsic goals in physical activity at some level, explicitly distinguishing between these goal types resulted in some degree of uncertainty. To extend these findings, we conducted a further study to determine whether significant clustering by goal type would occur for the free recall of modal physical activity goals from Study 1. For the second study goal coding was carried out by SDT experts, as findings from Study 1 provided evidence that participants may encounter difficulty when explicitly categorizing goals into the proposed intrinsic and extrinsic categories.

Study 2

Method

Participants. Participants ($N = 104$, 33 males, 67 females, information on gender missing for four participants, $M_{\text{age}} = 23.53$, $SD = 8.15$) were undergraduate and postgraduate students of economics, engineering, education, computer science, and politics of the University of Nottingham.

Procedure. A free-recall paradigm was employed to explore whether participants' recall of a list of health behavior goals would be clustered by goal type from SDT. The list of goals was developed from the modal responses from Study 1, and intrinsic and extrinsic goals were alternated such that two goals of the same type did not appear consecutively. This was intended to prevent clustering from occurring as an artifact of order of presentation of the goals. The list of stimuli can be found in Table 1. The study was created as an online survey and consisted of a series of stages. A website link was emailed to prospective participants, which directed them to the online survey. Participants were informed that the investigators were interested in determining why people engage in leisure-time physical activity and that they would be asked to complete four short tasks to help the investigators address that question. Study protocol adhered to the British Psychological Society and institutional guidelines for ethical practice. Participants provided informed consent and were informed of their right to withdraw from the study at any time, and that the anonymity of the data was ensured.

In the first task, participants were presented with the list of leisure-time physical activity goals and were asked to read the list and consider how the goals may apply to their own engagement in leisure-time physical activity. Participants were then asked to make a behavioral decision regarding their leisure-time physical activity, as Trafimow and Sheeran (1998) showed that the clustering of instrumental and affective attitudes in a similar recall paradigm occurred only when participants were asked to make a behavioral decision regarding the attitude object. A seven-point Likert scale was provided for participants to indicate how frequently they would engage in physical activity behavior in their leisure-time during the following month ranging from one to seven days per week. Participants were then prompted to move to the next page of the survey, where they were presented with a distraction task.

This task was unrelated to the purpose of the experiment and required participants to write a passage of prose about their most recent holiday. This was intended to prevent participants from simply recalling the list of goals verbatim.

Following completion of the distraction task, participants were prompted to move to the next page of the survey, which contained the recall task. Instructions stated that participants should try to remember the goals that they read a few minutes previously and list them in the text box provided. Participants were encouraged to try to recall as many goals as possible. Finally, participants were prompted to move to the final page of the survey, which informed them that the survey was complete and thanked them for their participation. Importantly, participants were not able to move backward to a previous page at any point in the survey, which ensured that they were unable to return to the original goals list when asked to recall the goals.

Data Analysis. The ARC index was used to assess the clustering of recalled intrinsic and extrinsic goals, following the same method as employed in Study 1. The ARC index computes the chance-expectancy value on the basis of participants' recalled items rather than using the original list of stimuli and was therefore appropriate for this analysis. Again, independent expert raters categorized the goals, with a 100% agreement level. As in Trafimow and Sheeran's (1998) study, recall protocols were scored using a "general meaning" criterion before cluster scores were computed, i.e., if participants recalled the essence of the goal but not using the exact wording from the original goal list, this was considered a correct recall.

Results

Results indicated that 31 participants exhibited perfect clustering by goal type in their recall. A one-sample *t* test indicated that the mean clustering score ($M = .17$, $SD = .71$) differed significantly from chance clustering, $t(103) = 2.49$, $p < .05$, $d = 0.49$.

Discussion

Results were consistent with those of Study 1, providing further evidence for individuals' ability to differentiate between intrinsic and extrinsic goals in a physical activity context. The positive nature of the mean clustering score suggested that participants in this sample exhibited significant clustering by goal type when recalling a list of goals relating to leisure-time physical activity, despite presentation of the goals in such a way as to deter recall by goal type.

General Discussion

The present studies aimed to determine whether individuals can and do actively differentiate between intrinsic and extrinsic goals for a health-related behavior, namely, leisure-time physical activity. Although the SDT literature has reported differential effects of intrinsic and extrinsic goals on a variety of outcome variables, such as need satisfaction, persistence, learning, and achievement (e.g., Sebire et al., 2009; Vansteenkiste et al., 2004a), research has not previously addressed whether individuals naturally distinguish between these two goal types. Grounded in methods used to provide empirical support for the construct validity of the instrumental

and affective components of attitude, the results of Studies 1 and 2 indicate that individuals differentiate between intrinsic and extrinsic goals without awareness, as both freely generated and recalled goals exhibited clustering by goal type that was significantly above chance levels. Goals did not appear to cluster semantically, but rather according to goal type. This suggests that individuals have formed strong associations between different types of intrinsic goals and different types of extrinsic goals, and that when asked to generate or recall a goal list, activation spreads from one goal to others of the same type. Thus, it appears that intrinsic and extrinsic goals are represented together in memory in terms of their recall, in accordance with the key tenet of SDT. These associations remained despite priming participants not to recall the physical activity goals in clusters through ordering the list of stimuli such that a goal was never preceded by a goal of the same type. These findings support the investment of resources into interventions primarily aimed at encouraging a focus on intrinsic relative to extrinsic goals in physical activity through validating this conceptual distinction between goal types.

However, when participants were asked to code their own freely generated physical activity goals as intrinsic or extrinsic, errors in categorizing goals were found. This suggests that individuals may differentiate between intrinsic and extrinsic goals at an implicit or nonconscious level and that they have difficulty discriminating between these goal types explicitly. Alternatively, the methodology employed within the current study may have contributed to the differences observed between the researchers' and participants' coding of goals. The definitions of "intrinsic" and "extrinsic" provided for participants were aligned with definitions of intrinsic and extrinsic motivation rather than goal content, whereas the coding system employed by the researchers was based on previous research on goal content. Although this is a limitation of the present research, providing definitions and examples of intrinsic and extrinsic goal content for participants could have led to systematic biases in their coding of goals. This represents an inherent problem with research of this nature and calls for additional methods to explore individuals' ability to discriminate between intrinsic and extrinsic goals. One possible method that would not require the use of goal terminology in participant instructions would be a goal sorting task in which participants would be instructed only to organize goals into meaningful groups.

Findings largely mirror those of Trafimow and Sheeran (1998) for cognitive and affective attitudes, although these researchers did determine significant clustering when participants coded their beliefs as cognitive or affective. This difference could be due to methodological variations and the complexity of the distinction. In the current study, participants were asked to list and code goals that they or anyone else may wish to achieve through leisure-time physical activity behavior, whereas Trafimow and Sheeran asked participants to list and code only their own personal beliefs about a behavior. The focus on individuals' own beliefs in Trafimow and Sheeran's study may have resulted in greater ease in categorizing them as cognitive or affective, whereas the broader nature of the generation of goals in Study 1 could have resulted in participants experiencing more difficulty in differentiating between goals that were intrinsic or extrinsic.

In addition, the various types of motivation underlying physical activity goals are likely more complex in nature than the distinction between cognitive and affective components of attitude, thus making the task of discerning intrinsic and extrinsic

goals more difficult. This is because extrinsic motivation can be conceptualized as being more or less self-determined, according to SDT, and there may be more subtle distinctions made within the extrinsic goal category (Deci & Ryan, 1985; Ryan & Connell, 1989). For example, the extrinsic goal of losing weight could potentially be driven by self-determined motivation if it is personally valued and endorsed by the individual. The distinction between intrinsic and extrinsic goal content may not therefore reflect the complexity of the goal striving process and an appreciation of the motivational orientation underlying the goal may be necessary to predict well-being and behavioral outcomes in leisure-time physical activity. This assertion is supported by Sebire and colleagues' (2009) finding that intrinsic goal content did not predict exercise behavior beyond individuals' self-determined motivation for exercise. The understanding of individuals' ability to differentiate between intrinsic and extrinsic goals could therefore be improved by exploring whether people can differentiate further between the goals related to the various types of motivation on the motivational continuum proposed by SDT, rather than limiting the test of their discriminatory ability to the broad intrinsic/extrinsic distinction.

The present studies used recall methods to determine whether individuals make the distinction between intrinsic and extrinsic goals. As results of the present studies indicate that individuals do hold associations between intrinsic goals and between extrinsic goals in memory but encounter difficulties when asked to code their goals as intrinsic or extrinsic, researchers may wish to explore whether individuals' apparent ability to differentiate intrinsic and extrinsic goals without awareness is replicated using implicit tests. These tests employ indirect assessments of constructs of interest using methods such as priming and word categorization tasks to tap automatic processes rather than relying on direct and deliberative verbal or written reports (Fazio & Olson, 2003). One form of implicit test enables researchers to determine the strength of an association between a construct of interest and a particular attribute, for example by comparing response latencies for trials in which participants are asked to respond only to stimuli representing the target category or the attribute and to ignore all other stimuli against trials in which participants respond only to stimuli representing the target category or a *different* attribute. This task, known as the *go/no-go association task* (Nosek & Banaji, 2001), could be used to determine whether intrinsic and extrinsic goals can be discriminated at an implicit level and test individuals' general orientation to pursue a particular goal type using attributes such as "self"/"good" and "other"/"bad." Alternatively, a priming paradigm could be used to prime either an intrinsic or extrinsic goal orientation, followed by a lexical decision task containing words related to intrinsic and extrinsic goals in physical activity. As the prime would not need to include specific goal terminology or reference to the distinction between intrinsic and extrinsic goals, this would confer the advantage of avoiding bias. Response latencies for the identification of goal-related words consistent with the prime (e.g., intrinsic) relative to control words would then be compared with response latencies for the identification of goal-related words that were inconsistent with the prime (e.g., extrinsic) relative to control words to determine individuals' ability to implicitly distinguish between the goal types. Researchers could then address the question of whether the differential effects of intrinsic and extrinsic goals are dependent upon individuals' awareness of this broad distinction.

Nevertheless, present findings have provided important preliminary evidence supporting the intrinsic-extrinsic distinction proposed by SDT through showing that individuals can and do discriminate between intrinsic and extrinsic goals in leisure-time physical activity, albeit seemingly outside their conscious awareness. It is recommended that the methodology employed in the current study is applied in other behavioral domains to provide greater support and converging evidence for the distinction between intrinsic and extrinsic goals.

Note

1. The definitions of “intrinsic” and “extrinsic” provided for participants were aligned with definitions of intrinsic and extrinsic motivation rather than goal content. This approach was chosen because the provision of definitions and examples of intrinsic and extrinsic goal content for participants could have led to systematic biases in their coding of goals. Further, the definitions of intrinsic and extrinsic motivation provided were believed to adequately represent the essence of the distinction between intrinsic and extrinsic goals and therefore to provide a reliable guide for participants’ coding of their goals.

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