Goal desires moderate intention-behaviour relations

Andrew Prestwich

Institute of Psychological Sciences, University of Leeds

Marco Perugini

Faculty of Psychology, University of Milan – Bicocca (Italy)

Robert Hurling

Unilever Corporate Research, Colworth, Bedford, MK44 1LQ, United Kingdom

Author Note

This study was funded by Unilever (grant SPHERE CH-2003-1010).

Correspondence concerning this article should be addressed to Dr. Andrew Prestwich, Institute of Psychological Sciences, University of Leeds, Leeds, LS2 9JT, United Kingdom, email: a.j.prestwich@leeds.ac.uk; Tel. +44 (0) 113 343 8559; Fax: +44 (0) 113 343 5749.

ABSTRACT

Previous research has largely ignored the potential impact of goal-related constructs on behaviour. Three studies addressed this issue by examining the direct and moderated effects of goal desires on behaviour. All of the studies required participants to complete baseline measures and then a follow-up indicator of behaviour. In the first study (N=119) that focused on fruit intake, and studies 2 (N=123) and 3 (N=96) concerned with drinking alcohol, goal desires interacted with behavioural intentions to affect behaviour. Specifically, behavioural intentions were more reliably related to behaviour when goal desires were strong. The results of the third study suggested that in order to obtain such interactive effects, the strength of the overarching goal must remain stable. The findings reveal that goals and behavioural intentions can operate simultaneously and jointly influence action, a view that contradicts postulations that the effects of goals are fully mediated by more proximal behavioural determinants.

Goal desires moderate intention-behaviour relations

Imagine two female smokers, Anna and Claire, who have smoked for fifteen years. Despite intending to stop smoking their attempts have remained futile. All of a sudden Anna manages to quit smoking. Why? She becomes pregnant and has the goal to give birth to a healthy baby. As soon as the baby is born Anna starts smoking again. Has Anna's intention to stop smoking changed and become stronger than Claire's intention? Possibly, but it is also quite feasible to envisage that Anna and Claire are two of the many smokers who intend to quit, develop intentions to do so, yet fail to transform their intentions into action; it is the co-existence of a strong goal for Anna that has enabled her to finally act in line with her behavioural intentions. At times, relying on one's intentions to guide behaviour is not enough- one's overarching goals are influential. The examination of the interaction between one's intentions and the corresponding overarching goals is the central aim of this contribution.

The models

Ajzen's (1991) Theory of Planned Behaviour (TPB) is mute concerning the role of goals (cf. Eagly and Chaiken, 1993; Perugini & Conner, 2000). They are implicitly viewed simply as a distal predictor that may influence behaviour in a way such that its effects are subsumed by more proximal determinants such as one's attitudes (e.g. their beliefs about whether their smoking is good or bad), subjective norms (e.g. whether the individual feels that important others want them to stop smoking) and perceived behavioural control (e.g. their perceptions regarding the ease at which they can stop smoking or their ability to quit). These three factors, in turn, jointly affect one's behavioural intention that is seen as the direct precursor to behaviour. In other words, the underlying assumption is that regardless of the goals (e.g., to be healthy) for which behaviours (e.g., to exercise) may be pursued, the

analysis of the determinants of this latter level is sufficient to predict specific actions. This view of a single-level processing of information from goals to behavioural intentions is at odds with more recent models of goal-directed behaviour including the Extended Model of Goal-Directed Behaviour (EMGB; Perugini & Conner, 2000).

Within the Model of Goal-Directed Behaviour (MGB; Perugini & Bagozzi, 2001) and especially the EMGB, the interplay between goal and behavioural levels is brought into the forefront by considering behaviours in terms of the goals for which they are functional. The models maintain the TPB constructs, but due to the insufficiency of these constructs to fully understand and explain one's volitions (Armitage & Conner, 2001), tap additional areas of motivation, affect, and habit. Importantly, behavioural desires are added as the most proximal determinant of intentions, going some way in explaining how people's attitudes, subjective norms and perceived behavioural control come to influence one's intentions. While desires are expected to be typically highly correlated with intentions, they are nonetheless different, both theoretically and empirically. Theoretically, desires pertain to a personal motivation to perform a given action or achieve a given goal whereas intentions go one step further in the chain to action and additionally involve some kind of personal volition including planning and feasibility considerations (Perugini & Bagozzi, 2004a). While desires reflect what one wants to do or to achieve (Bagozzi, 1992), intentions are assumed to indicate the factors that influence behaviour and to reflect how hard people are willing to try to enact a behaviour (Ajzen, 1991). Intentions take account of facilitating and inhibiting factors while desires do not. Indeed, empirical evidence from Armitage and Conner's (2001) meta-analysis indicated that PBC explained an additional 8% of variance in intentions, over and above subjective norms and attitudes, yet PBC explained only an additional 2% in

desires. Recent work has also shown that PBC reliably predicts the discrepancy between one's desires and intentions (Perugini et al., 2006). Further empirical evidence, both correlational and experimental, has supported their discriminant validity (Perugini & Bagozzi, 2004a,b). Attitudes, subjective norms, perceived behavioural control, past behaviour, positive and negative anticipated emotions, along with goal desires, in the EMGB, are direct predictors of behavioural desires that in turn predict intentions to act. The MGB and EMGB have been successfully applied to behaviours such as weight control, studying and learning of statistical software (Perugini & Bagozzi, 2001; Perugini & Conner, 2001; Leone, Perugini & Ercolani, 2004) typically explaining around 30% more variance in intentions than the TPB.

While the models differ in terms of the determinants and mechanisms that underlie intentions, they assume the same determinants predict and explain behaviour. For the TPB, MGB, and EMGB, behaviour is predicted by intentions with a possible additional predictive role of perceived behavioural control. In other words, the models differ in explaining how intentions come about but assume the same two determinants, intentions and perceived behavioural control, explain how actions occur.[1]

The role of goal desires

In the EMGB, goal desires provide a link between one's goals and intentions (e.g., "I desire to achieve goal Y by performing behaviour X") and have been conceptualized as a direct predictor of behavioural desires. This captures the idea that one's motivation to engage in a particular action is also directly affected by one's motivation to achieve a certain goal for which the specific action is a means. However, the effects of goals on behaviour might be broader than originally conceptualized in the EMGB. Goal desires might also contain self-regulatory benefits

and be an instance under which intentions are particularly predictive of behaviour. There are two primary reasons for this.

First, the stronger the goal desire, the stronger the link between the goal (Y) and behavioural intention (X) and as such goal activation becomes more likely to lead to intention activation. Consistent with Kruglanski et al's (2002) Theory of Goal Systems, repeated pairings of goals and means (including intentions) is one key mechanism leading to an association between the two. According to Kruglanski et al. (2002, p.333), "goal systems consist of mentally represented networks wherein goals may be cognitively associated to their corresponding means of attainment and to alternative goals" and "typically, facilitative links may exist…between goals and their corresponding means". When activated at a suitable opportunity to act, intentions should be particularly predictive of behaviour. For example, intentions have been shown to be a stronger predictor of behaviour when the time interval between the assessment of intentions and behaviour is short (e.g., Sheeran & Orbell, 1998) and increased accessibility of intentions strengthens the link between intentions and behaviour (Cooke & Sheeran, 2004). Intentions, like overarching goals (see Moskowitz, Li, & Kirk, 2004), should become activated by a range of factors including conscious choice and environmental features that prime the intention (or goal). Importantly, when a strong goal desire exists, there should be a strong link, within a mental hierarchy, between one's goals and intentions. As such, activation of one's goals should provide an additional route to intention activation (and vice-versa). Consequently, goal desires, by bridging the gap between one's goals and intentions, should increase the likelihood that intentions are activated across a range of situations and thus should increase the correspondence between intentions and behaviour. In

other words, goal activation might serve to strengthen, remind, and ultimately activate one's intentions (cf. Kruglanski et al., 2002).

Second, possessing a particularly strong goal should help one to focus on this goal whilst inhibiting other, potentially conflicting, goals (Mischel & Ebbesen, 1970)- and consequently, via strong goal desires, help protect one's behavioural intentions. Temptations that might otherwise automatically derail attempts to engage in/refrain from a particular behaviour, in the presence of a strong goal have been shown to automatically activate the overarching goal (Fishbach, Friedman, & Kruglanski, 2003) thus preventing derailment. This occurs because over time the temptations become associated with the higher order goal with which they interfere. The ability to focus on the current goal and inhibit conflicting goals is a vital aspect of successful self-regulation (Carver & Scheier, 1998; Gollwitzer & Moskowitz, 1996; Shah & Kruglanski, 2002) that should increase the correspondence between what one intends to do and what one actually does.

Anna who quits smoking due to her pregnancy does so because the goal of giving birth to a healthy baby is highly accessible and salient and this, via strong goal desires, triggers relevant intentions, and helps to protect one's goal (and associated intentions) from distraction from competing goals or temptations. In summary, strong goal desires should increase the likelihood that intentions are activated at suitable opportunities and, once activated, the intention is more likely to be protected by the associated goal. The aim of this contribution, therefore, is to examine whether goal desires moderate the relationship between intentions and behaviour. On the basis of this analysis, it is meaningful to hypothesize that goal desires can moderate the relationship between intentions and behaviour such that when one has strong goal desires, the relationship between intentions and behaviour should be enhanced. This

moderator effect should occur over and above the main influence of intentions and perceived behavioural control on behaviour.

STUDY 1

This study focused on fruit consumption. Eating fruit is an important health behaviour and has been linked to a range of health benefits including reduced risk of coronary heart disease and stroke (Department of Health, 1994). Understanding the factors that govern one's intentions and impact on how intentions are translated into fruit consumption is crucial in establishing effective means to increase fruit intake. In order to do this, participants were required to complete measures of their goal desires and behavioural intentions before a follow-up index of fruit intake two weeks later.

METHOD

Participants

One hundred and nineteen students completed baseline measures after responding to an email advertisement. After 2 weeks, participants returned to complete the follow-up measure. Of the original 119 participants, 106 participants also completed the second part of the study. The final sample had a mean age of 22.22 years (*SD*=4.57 years) and consisted of 28 men and 78 women. Drop-out rates did not vary across sex, $\chi^2(1)=0.67$, $p>.05$. MANOVA analysis showed that there were no significant differences between those participants who completed the follow-up measure and those that did not on measures of perceived behavioural control, goal desires, intentions and age, $F(4, 111)= 0.10$, $p>.05$. Participants received £5 or course credit after completing measures at both time-points.

Design and Procedure

The study utilized a longitudinal design with data collection at two time points separated by two weeks. At time 1, participants completed measures of behavioural

intention, perceived behavioural control and goal desires, along with other measures not reported here. Before responding to the goal-related items, participants were asked to write down the goal that they wanted to achieve by eating fruit in the next 2 weeks. Before this, they were provided with three suitable examples. Their chosen goal was subsequently labelled and referred to as 'goal X'. Two weeks later, participants returned and completed a brief questionnaire assessing their fruit intake during the experimental period.

Measures

Three items reliably measured *goal desire* (α=.91). These were: 'How would you characterise your desire to achieve goal X by eating fruit?' (no desire [1]-very strong desire [6]); 'I desire to achieve goal X by eating fruit' (unlikely [1]-likely [7]); and, 'The intensity of my desire to achieve goal X by eating fruit can be described as' (nil [1]-extreme [10]).

Four items were used to measure *behavioural intentions* (α=.90). These were: 'I plan to eat fruit' (false [1]-true [10]); 'I will eat fruit' (strongly disagree [1]-strongly agree [7]); 'I will put effort into eating fruit' (strongly disagree [1]-strongly agree [7]); and 'I intend to eat fruit' (unlikely [1]-likely [7]).

Perceived behavioural control (α=.61) was monitored using the items: 'How much control do you have over your eating fruit?' (no control [1]-complete control [10]); 'If I wanted to, it would be easy for me to eat fruit' (highly unlikely [1]- highly likely [10]); and, 'For me to eat fruit is: (difficult [1]-easy [10])'.

To assess their *fruit intake*, participants were asked to complete a table regarding their fruit consumption over the last week. In the table, they had to indicate how many portions of apples, bananas, oranges, satsumas/clementines/tangerines, kiwi fruits, peaches, pears and handfuls of grapes and berries (plus any other fruits

that they had to specify) they had consumed. Participants were told that one portion of fruit was, for example, 1 medium apple, or 1 medium banana, or 2 small satsumas, or 3 dried apricots. Participants completed the same table at follow-up but were asked to indicate their fruit intake over the previous two weeks as an index of their *time 2 fruit intake*. In both cases, the portions were summed to generate food intake indices.

RESULTS

The main goal relating to fruit intake was to be healthy (80.5%). The most common other goal was to enjoy oneself (7.6%). The correlations between the study variables are shown in Table 1. Behavioural intentions, goal desires and PBC were all significantly correlated with fruit intake at time 1 and fruit intake at time 2.

Insert Table 1 about here

Moderator effects of goal desires.

To test whether goal desires moderated the effect of intentions on behaviour, regression analyses were conducted in which goal desire and intentions were entered together within a hierarchical multiple regression before the interaction term (goal desire x intention) was entered on the second step. On the final step, PBC was entered to test whether any moderation effects occurred over and above the effects of PBC. Variables were centered before calculating the interaction term in order to reduce multicollinearity. Significant interactions, in all three studies, were clarified through simple slopes analysis (Aiken & West, 1991) across strong (z=1), moderate (z=0), and weak (z=-1) goal desires using the computational tool provided by Preacher, Curran and Bauer (in press).

In the first regression, fruit intake at time 1 was the dependent variable. In this analysis, intention, β=.31, p=.02, and goal desires, β=.29, p=.02, had significant, and independent, effects on behaviour. Importantly, there was a significant intention by

goal desire interaction (β=.33, p=.001) on the second step. Specifically, intentions predicted fruit intake at time 1 most reliably when goal desires were strong (B=0.66, S.E.=0.16, *t*=4.11, *p*=.0001; for moderate goals: B=0.49, S.E.=0.13, *t*=3.77, *p*=.0003; for weak goals: B=0.32, S.E.=0.12,, t=2.70, p=.008). This moderation effect remained significant, β=.33, *p*=.001, when PBC was entered on the final step.

In a further regression analysis, the time 2 fruit intake measure was used as the dependent variable. On this occasion, goal desires, β=.44, *p*=0.002, but not intentions, β=.08, *p*=0.57, significantly predicted fruit intake at time 2. Again a significant goal desire x intention interaction was obtained, β=.24, *p*=0.04, and this effect remained significant, β=.24, *p*=0.04, when PBC was entered. Simple slopes analysis indicated that intentions predicted time 2 fruit intake only when goal desires were strong (B=0.34, S.E.=0.18, *t*=1.84, *p*=.03, one-tailed). Intentions were unrelated to fruit intake when goal desires were moderate (B=0.22, S.E.=0.15, t=1.46, *p*=.15) or weak (B=0.01, S.E.=0.13, *t*=0.74, *p*=.46). The nature of the goal desire x intention interactions for fruit intake are illustrated in Figures 1 and 2 while the results of the regression analyses in this study, and the subsequent studies, are summarised in Table 2.

Insert Figures 1 and 2, and Table 2, about here

The results of the first study provide initial evidence that goal- and behavioural-level constructs interact to influence behaviour. Specifically, goal desires appear to moderate the impact of intentions on behaviour. However, as the measures did not refer to a specific time frame (i.e. 2 weeks) this approach might have underestimated (in the prospective analysis) the relationship between intentions (and PBC) and the dependent measure. This, in turn, could have increased the likelihood of obtaining significant moderator effects. Two further studies deal with this issue and

help to determine the generalizability of the previous findings by testing the same hypothesis in a different domain.

STUDY 2

This study examined the interaction between behavioural and goal-level constructs within the domain of alcohol drinking. Nearly one in two 16-24 year olds in England drink more than the recommended alcohol-related guidelines (Office for National Statistics, 2006) and in the United Kingdom it is estimated that adults aged 14 and over drink on average 11.3 units of alcohol per week (Institute of Alcohol Studies, 2005). This is particularly worrying given evidence suggesting that adolescents are particularly vulnerable to the neurotoxic effects of alcohol (see Barron et al., 2005). Like the previous study, Study 2 employed a longitudinal design but on this occasion employed time-framed items and thus focused solely on prospective, rather than cross-sectional, prediction. Participants were required to complete baseline measures of behavioural intention, goal desire, and PBC followed by a measure of drinking behaviour two weeks later.

METHOD

Participants

One hundred and twenty-seven participants were originally recruited for this study using opportunity sampling. Four participants failed to complete both baseline and follow-up measures and were subsequently dropped from the main analyses. The final sample (N=123), with a mean age of 24.92 years (SD= 8.75 years), consisted of 56 men and 67 women. Within this final sample, 87 were students. Rates of drop-out did not differ across sex, $\chi^2(1)=0.66$, $p>.05$, but non-students were marginally more likely to dropout of the study than non-students, $\chi^2(1)=3.81$, $p=.05$. MANOVA indicated that there were no differences between participants who completed all

measures and those who dropped out in age, PBC, behavioural intentions and goal desires, $F(4, 122)=0.16$, $p>.05$.

Design and Procedure

The study used a longitudinal design with two waves of data collection separated by 2 weeks. Participants were contacted in campus and invited to participate in a study concerning their attitude towards alcohol drinking and informed that they would be contacted again in 2 weeks time for the completion of a short questionnaire. After 2 weeks, they were contacted and administered the final part of the questionnaire.

Measures

The questionnaires at times 1 and 2 required participants to enter their initials and date of birth to enable the identification of each participant at each stage of the study. In addition, the time 1 questionnaire included items assessing behavioural intention, goal desire and PBC (along with other EMGB measures not reported here), whilst the time 2 questionnaire contained a measure of drinking behaviour during the period of the study. Before answering questions that assessed goal desires, participants were first asked to write, at the top of the page, the reason that would best explain their drinking over the next 2 weeks. In the subsequent section of the questionnaire, this was referred to as 'reason X'.

The actual measures in this study were identical to those employed in the first study except for some minor differences. First, the phrase 'eating fruit' was changed to 'drinking alcohol over the next 2 weeks' for each item. Second, the item 'How strongly would you characterise your desire to achieve reason X by drinking alcohol over the next 2 weeks?' was used instead of 'How would you characterise your desire to achieve goal X by eating fruit?' Measures of intentions ($\alpha=.89$) and goal desires

(α=.86) possessed high reliability. However, the three items that measured *PBC* yielded unsatisfactory internal reliability (α=.55). The first item, 'How much control do you have over your drinking alcohol in the next 2 weeks?' (no control-complete control), was removed, and discarded from the analyses, to enhance the reliability of this measure (α=.83). The PBC measure thus comprised of two items: 'If I wanted to, it would be easy for me to drink alcohol in the next 2 weeks' (highly unlikely-highly likely), and 'For me to drink alcohol in the next 2 weeks is (difficult-easy)'. To assess *drinking* behaviour, participants were asked 'How much alcohol did you drink in the last week?' Participants were required to note down the number of pints of beer, glasses of wine, and measures of spirits. The responses were then converted to units of alcohol by multiplying the values for number of pints by 2 (as a pint of beer contains two units of alcohol) and adding them to the responses for glasses of wine and measures of spirits (each containing one unit of alcohol).

RESULTS

The method of analysis was the same as in Study 1. The principal reasons (goals) for drinking were to be sociable (43.3%), relax (26.8%) or to have fun (20.5%). The variables were largely inter-correlated and their relationships are displayed in Table 3.

Insert Table 3 about here

Moderator effects of goal desires

Hierarchical multiple regression analyses were conducted to determine whether goal desires moderated the effect of intentions on alcohol intake. In the first step of the analyses, intentions and goal desires were entered together, before their interaction term on the second step. The results from these analyses were summarised previously in Table 2.

For self-reported drinking behaviour, as for fruit intake in Study 1, intentions and goal desires made significant unique contributions to the prediction of behaviour. Furthermore, a significant goal desire by intention interaction emerged. Simple slope analysis, the outcome of which is illustrated in Figure 3, indicated that intentions significantly predicted drinking behaviour when goal desires were weak (B= 0.30, S.E.=0.10, t=2.96, p=.004), moderate (B= 0.46, S.E.=0.10, t=4.60, p<0.0005), but were most strongly related to drinking behaviour when goal desires were strong (B=0.63, S.E.=0.13, t=4.65, p<0.0005).

Insert Figure 3 about here

Study 2, in which time-framed item wording was used, replicated the moderation effects obtained in Study 1. However, also this study is not without its limitations. A self-report measure of alcohol intake over one week was used as it was anticipated that some participants, at least, would have difficulty recalling their alcohol intake over the full two weeks. Given that any difference between a one week and a two week measure should be random across the sample (i.e., one week is a representative sample of two weeks across participants) and therefore not distort validity, the increased validity due to a better recall of one's alcohol intake should, overall, increase validity of the behavioural measure. On the other hand, it could also be argued that an index over the full two weeks might have been preferable because of the correspondence between time frame of the questions and behavioural measure. Finally, it might be argued that the wording of the new goal desire item might have been more precisely framed to assess the strength of one's goal desire.

STUDY 3

A third study addressed the limitations of the second study and provided another opportunity to test the robustness of the moderation effect. However, the

primary aim of this study was to extend the theory that intentions will be more predictive of behaviour when they are linked to strong goal desires. It has been already shown that intentions are more predictive of behaviour when the strength of the intention remains stable and attitudes are more predictive of behaviour when they are more stable (see Cooke & Sheeran, 2004, for a review). Consistent with this, the beneficial effects of holding strong goal desires (in the sense of helping one to translate their intentions into action) should only be achieved when the strength of the goal desire remains stable. That is, the same arguments put forward for the moderating role of temporal stability on the links between attitudes and intentions on behaviour can be extended to goal desires. Goal desires that are stable are stronger and more likely to play a role in people's decision making processes compared to goal desires that are unstable. As we have argued before and found empirical support in the first two studies, a key role of goal desires is to enhance the likelihood that intentions will be transformed into actions. It follows that stable goal desires should have an even stronger moderation influence on intentions en route to behaviour.

To assess the stability of goal desires, in Study 3, participants completed items tapping their goal desires at baseline and follow-up. In addition, participants completed motivational measures at baseline and a measure of alcohol intake at two-week follow-up. A three-way interaction was predicted (goal desires x intentions x goal desire stability) such that strong goal desires would increase the correspondence between one's intentions and actions when the goal desires remain stable.

METHOD

Participants

One hundred and thirteen students completed baseline measures. Seventeen participants did not return and complete the follow-up questionnaire and were

subsequently dropped from the main analyses. The final sample (*N*=96), with a mean age of 21.83 years (*SD*= 4.19 years), consisted of 24 men and 72 women. Rates of drop-out did not differ across sex, $\chi^2(1)=0.10$, $p>.05$. MANOVA indicated that there were no differences between participants who completed all measures and those who dropped out in age, PBC, behavioural intentions and goal desires, $F(4, 105)=0.98$, $p>.05$.

Design, Procedure & Measures

The study used the same longitudinal design as in study 2 except the measure of alcohol intake asked participants to note down the number of pints of beer/lager/cider, glasses of wine and measures of spirits that they had consumed in the last two weeks (rather than one week) and the wording of the goal desire items reverted back to the format used in Study 1. Measures of *behavioural intention* (α=.90) and *goal desire* (at time 1: α=.89; at time 2: α=.89) were both internally reliable. *PBC*, as in Study 2, was not internally reliable (α=.58). The first PBC item was dropped ('How much control do you have over your drinking alcohol over the next 2 weeks?') to improve the reliability of the measure (α=.60). *Goal desire stability* was determined by administering the same items at baseline and follow-up. From this, a range of indices of stability can be calculated (Conner et al., 2000): the sum of absolute differences between goal desire items at the two time points (with or without adjustment for maximum possible change); the absolute difference between the sum of goal desire items at both time points (with or without standardization for scale length); the number of items that exhibited change; the within-participants correlation between goal desire items at Time 1 and Time 2. These indices have often been combined into a single index (e.g., Sheeran & Abraham, 2003). The mean of the measures (following the standardization of each measure and the exclusion of the within-participant

correlation index[2]) constituted the goal desire stability index (α=.86). The scales were reversed such that a higher score reflected greater stability.

RESULTS

The principal goals for drinking were to be sociable (34.8%), relax (23.2%) or to have fun (25.9%). Behavioural intentions, goal desires and PBC were all significantly correlated with alcohol intake. Goal desire stability was unrelated to any of the measured variables. The relationships between the variables are displayed in Table 4.

Insert Table 4 about here

Moderator effects of goal desires

Hierarchical multiple regression analyses were conducted to determine whether goal desires moderated the effect of intentions on alcohol intake and whether this effect was dependent on the strength of the overarching goal remaining stable. In the first step of the analyses, intentions, goal desires and goal desire stability were entered together, before the resulting two-way interaction terms on the second step. On the final step, the three-way interaction term was entered. The results from these analyses were summarised previously in Table 2.

On the first step, while goal desire just fell short of statistical significance, β=.19, p=.12, behavioural intentions were a significant predictor of alcohol intake, β=.45, p=.001. On the second step, the only significant two-way interaction was the predicted interaction between intentions and goal desire β=.21, p<.05 (see Figure 4). Intentions were most likely to be predictive of behaviour when the underlying goal desire was strong (B=0.64, S.E.=0.15, t=4.16, p=.0001; moderate goal desires: B=0.48, S.E.=.12, t=3.92, p=.0002; weak goal desires: B=0.32, S.E.=0.14, t=2.23, p=.03). A significant intention x goal desire x goal desire stability interaction β=.30,

p=.03 supported the hypothesized prediction. Specifically, intentions were most predictive of behaviour when goal desires were strong and remained stable (B=1.17, S.E.=0.25, *t*=4.61, *p*<.0005) and were also significant when goal desires were stable but weak (B=.40, S.E.=.20, *t*=1.99, *p*<.05). Intentions were unrelated to behaviour when goal desires were strong but unstable (B=0.14, S.E.=0.23, *t*=0.62, *p*=.54) and when goal desires were weak and unstable (B=0.15, S.E.=0.14, *t*=1.03, *p*=.31). The three-way interaction remained significant when the effect of PBC was controlled, β=.29, *p*=.03, while the two-way, intention x goal desire, interaction became marginally significant, β=.20, *p*=.07.[3]

Insert Figure 4 about here

GENERAL DISCUSSION

Three studies are presented that indicate goal desires can moderate the effect of behavioural intentions on action. Specifically, holding a strong goal desire strengthens the link between intentions and behaviour and thus helps an individual to benefit from their positive intentions. This effect emerged both cross-sectionally (study 1) and prospectively (studies 1-3) and was highlighted using two behaviours-fruit consumption and drinking alcohol. The final study suggested that in order to help translate intentions into behaviour, the strength of one's goal desire should remain stable.

The EMGB, in its original format, goes some way in explaining how intentions increase the likelihood of behaviour. According to the model, commitment and effort are central for this purpose (see also Bagozzi, 1992). However, the evidence provided by the three studies presented here suggests that the EMGB might reasonably be extended further to describe the circumstances under which intentions more readily lead to behaviour. Just as Perugini and Conner (2000) argued that

behaviours do not occur independently of one's goals, indeed they state that behaviour should be viewed as functional to the achievement of goals, it seems that processes across both goal- and behavioural- levels can interact to drive behaviour. According to the simple slopes analyses, intentions become more strongly associated with behaviour when there is a strong (and stable) goal desire. The presence of a strong, overarching goal to which the behaviour is functional, increases the probability of converting a positive intention into action. The influence of goal-related constructs, in these instances goal desires, do not appear to be fully mediated by more proximal determinants of behaviour such as those proposed by models including the TPB (Ajzen, 1991) - PBC or even intentions. The findings of these three studies suggest that goals can have a post-intentional influence on behaviour by augmenting the effect of intentions on behaviour.

The key contribution of this research is highlighting that goal and behavioural levels can interact to have a synergistic effect on behaviour. Both behavioural and goal levels, and how they interact, are vital determinants of action. Determining the exact nature of the mechanisms through which goal desires strengthen the link between intentions and behaviour might be aided through the experimental manipulation of goal desires and closer assessment of the roles of inhibiting temptations and reduced goal conflict arising from the presence of strong goals. These issues might well represent interesting avenues for future research.

Some limitations should be highlighted. First, by not using time-framed items in Study 1, the likelihood of obtaining moderator effects might have been increased. However, equivalent moderated relationships were obtained in studies 2 and 3. Second, the research might have benefited from the use of objective measures of behaviour. Third, the studies primarily recruited undergraduate students and random

sampling of the general population would have aided generalisability. Nevertheless, frequent drinking of alcohol and insufficient fruit consumption are clearly important issues to address in the young given the current levels of alcohol intake and poor diets, and the associated health effects of these behaviours. The presented findings suggest that targeting and strengthening goal desires to which intentions are linked is an important addition to strategies designed to simply enhance one's intentions.

The findings have additional theoretical and practical importance. As intentions and goal desires explained significant unique portions of variance in behaviour (in studies 1 and 2) the data provide further empirical evidence for the separation of intentions and (goal) desires (see also Armitage & Conner, 2001; Perugini & Bagozzi, 2004a,b). Additionally, while we focused on the role of goals in affecting intentions (a top-down approach) and its subsequent relations with behaviour, it is also possible that reverse, bottom-up, effects occur. Specifically, when an intention is activated, the underlying goal should be likely to be more activated. In general, we do not have experimental data that can allow us to disentangle whether it is goal activation that leads to stronger intention activation, the reverse, or both. Experimental studies are needed to establish the specific dynamics. However, whatever the flow, an activation of one concept should lead to activation of the other due to their interconnectedness within a hierarchy of goal systems.

This research adds to recent research disputing that intentions are the most proximal direct antecedent of behaviour such as that indicating the effects of intentions can be moderated by properties of intentions including accessibility, temporal stability, direct vs. indirect experience and certainty (see Cooke & Sheeran, 2004, for a review), as well as anticipated regret (Abraham & Sheeran, 2003; Sheeran & Orbell, 1999). By showing that the effect of intentions can be affected by the

presence or absence of strong goal desires, the research goes some way in explaining why a large proportion of individuals fail to act on positive intentions (Sheeran, 2002; see also Webb & Sheeran, 2006). Given the emergence of interactive effects between goal desires and behavioural intentions, existing models such as the TPB and EMGB might be adapted to accommodate these findings.

REFERENCES

Abraham, C., & Sheeran, P. (2003). Acting on intentions: The role of anticipated regret. *British Journal of Social Psychology, 42*, 495-511.

Aiken, L.S., & West, S.G. (1991). *Multiple regression: Testing and interpreting interactions*. Newbury Park, CA: Sage.

Ajzen, I. (1991). The theory of planned behaviour. *Organizational Behaviour and Human Decision Processes, 50*, 179-211.

Ajzen, I. (2002). Residual effects of past on later behavior: Habituation and reasoned action perspectives. *Personality and Social Psychology Review, 6*, 107-122.

Armitage, C.J., & Conner, M.T. (2001). Efficacy of the theory of planned behaviour: A meta-analytic review. *British Journal of Social Psychology, 40*, 471-499.

Bagozzi, R.P. (1992). The self-regulation of attitudes, intentions and behavior. *Social Psychology Quarterly, 55*, 178-204.

Barron, S., White, A., Swartzwelder, H.S, Bell, R.L., Rodd, Z.A., Slawecki, C.J., Ehlers, C.L., Levin, E.D., Rezvani, A.H., & Spear, L.P. (2005). Adolescent vulnerabilities to chronic alcohol or nicotine exposure: Findings from rodent models. *Alcoholism: Clinical & Experimental Research, 29*, 1720-1725.

Carver, C. S., & Scheier, M. F. (1998). *On the Self-Regulation of Behavior*. New York: Cambridge University Press.

Cooke, R., & Sheeran, P. (2004). Moderation of cognition-intention and cognition-behaviour relations: A meta-analysis of properties of variables from the theory of planned behaviour. *British Journal of Social Psychology*, *43*, 159-186.

Department of Health (1994). Nutritional aspects of cardiovascular disease. London: HMSO.

Fishbach, A., Friedman, R.S., & Kruglanski, A.W. (2003). Leading us not into temptation: Momentary allurements elicit overriding goal activation. *Journal of Personality and Social Psychology*, *84*, 296-309.

Gollwitzer, P.M., & Moskowitz, G.B. (1996). Goal effects on action and cognition. In E.T. Higgins & A.W. Kruglanski (Eds.), *Social psychology: Handbook of basic principles* (pp. 361-399). New York: Guilford Press.

Institute of Alcohol Studies (2005). *Drinking in Great Britain*. St Ives, UK.

Kruglanksi, A.W., Shah, J.Y., Fishbach, A., Friedman, R., Young Chun, W., & Sleeth-Keppler, D. (2002). A theory of goal systems. *Advances in Experimental Social Psychology*, *34*, 331-378.

Leone, L., Perugini, M., & Ercolani, A.P. (2004). Studying, practicing, and mastering: A test of the Model of Goal-Directed Behavior (MGB) in the software learning domain. *Journal of Applied Social Psychology*, *34*, 1945-1973.

Menard, S. (1995). *Applied logistic regression analysis*. Sage university paper series on quantitative applications in the social sciences, 07-106. Thousand Oaks, CA: Sage.

Mischel, W., & Ebbeson, E. (1970). Attention in delay of gratification. *Journal of Personality and Social Psychology*, *16*, 329-337.

Moskowitz, G.B., Li, P., & Kirk, E. (2004). The implicit volition model: On the preconscious regulation of temporarily adopted goals. *Advances in experimental social psychology, 36*, 317-413. San Diego, CA: Academic Press.

Myers, R. (1990). *Classical and modern regression with applications* (2nd edition). Boston, MA: Duxbury.

Office for National Statistics (2006). Drinking. http://www.statistics.gov.uk/CCI/nugget.asp?ID=1328&Pos=4&ColRank=2&Rank=800 Retrieved on 3 February, 2006.

Perugini, M. & Bagozzi, R. P. (2001). The role of desires and anticipated emotions in goal-directed behaviours: Broadening and deepening the theory of planned behaviour. *British Journal of Social Psychology*, *40*, 79-98.

Perugini, M., & Bagozzi, R.P. (2004a). The distinction between desires and intentions. *European Journal of Social Psychology*, *34*, 69-84.

Perugini, M., & Bagozzi, R.P. (2004b). An alternative view of pre-volitional processes in decision making: Conceptual issues and empirical evidence. In Haddock, G. & Maio, G.R.(Eds.), *Contemporary perspectives on the psychology of attitudes*. Hove, UK: Psychology Press.

Perugini, M., & Conner, M. (2000). Predicting and understanding behavioral volitions: The interplay between goals and behaviors. *European Journal of Social Psychology*, *30*, 705-731.

Preacher, K.J., Curran, P., & Bauer, D.J. (in press). Computational tools for probing interaction effects in multiple linear regression, multilevel modeling, and latent curve analysis. *Journal of Educational and Behavioral Statistics*.

Shah, J.Y., & Kruglanski, A.W. (2002). Priming against your will: How goal pursuit is affected by accessible alternatives. *Journal of Experimental Social Psychology, 38*, 368-383.

Sheeran, P., & Orbell, S. (1999). Augmenting the theory of planned behaviour: Roles for anticipated regret and descriptive norms. *Journal of Applied Social Psychology, 29*, 2107-2142.

Sheeran, P. (2002). Intention-behaviour relations: A conceptual and empirical review. In W. Stroebe & M. Hewstone (Eds.), *European Review of Social Psychology* (Vol. 12, pp. 1-30). Chichester: Wiley.

Verplanken, B. (2006). Beyond frequency: Habit as mental construct. *British Journal of Social Psychology, 45*, 639-656.

Webb, T.L., & Sheeran, P. (2006). Does changing behavioral intentions engender behavior change? A meta-analysis of the experimental evidence. *Psychological Bulletin, 132*, 249-268.

FOOTNOTES

[1] An additional difference between the TPB and both MGB and EMGB is that the latter two models assume a role for past behaviour in predicting behaviour. However, this difference is blurred in practice, as most applications of TPB also include measures of past behaviour, Furthermore, when past behaviour is measured in the same way as current behaviour, its inclusion in the models is tantamount to shift the focus to predict behaviour change. Finally, the status of past behaviour as a meaningful theoretical predictor has been questioned (Ajzen, 2002) and recent research tends to focus on independent measures of habits rather than past behaviour per se (Verplanken, 2006). For these reasons, we will not consider past behaviour in this contribution.

[2] The within-participants correlation index is problematic due to the tendency for all items within a time point to receive the same value, making the computation of a correlation impossible. This would result in loss of data (see also Conner et al., 2000).

[3] In study 3, when the discarded PBC item ('How much control do you have over your drinking alcohol over the next 2 weeks?') is used as an index of PBC rather than the two-item measure, the 2-way interaction between goal desires and intention was significant, $\beta=.18$, $p=.046$, as was the three-way interaction, $\beta=.30$, $p=.02$. Similarly, in study 2, the 2-way interaction remained significant, $\beta=.18$, $p=.01$, when the effect of the single-item measure of PBC was controlled.

Table 1: Correlation between study variables (Study 1) (*N*=119, unless stated)

	M	SD	1	2	3	4	5
1. Behavioural Intention (1-7)	5.64	1.40	-				
2. Goal Desire (1-10)	7.54	1.71	.78**	-			
3. Perceived Behavioural Control (1-10)	8.88	1.35	.51**	.38**	-		
4. Fruit Intake (Time 1: 1-week period)	9.24	7.86	.53**	.53**	.27**	-	
5. Fruit Intake (Time 2: 2-week period; *N*=106)	14.93	13.35	.43**	.50**	.20*	.79**	-

***p*<.005 (2-tailed) **p*<.05 (2-tailed)

Table 2: *Summary of Moderational Analyses (Studies 1-3)*

		Step 1			Step 2			Step 3		
Predictor	Dependent Variable	B	SE B	β	B	SE B	β	B	SE B	β
Goal Desire	Fruit Intake Time 1 (Study 1)	.29	.12	.29*	.33	.12	.33**			
Intention		.31	.12	.31*	.49	.13	.49***			
Intention x Goal Desire					.17	.05	.33**			
(controlling for PBC)					.17	.05	.33**			
Goal Desire	Fruit Intake Time 2 (Study 1)	.43	.14	.44**	.45	.13	.46**			
Intention		.08	.14	.08	.22	.15	.22			
Intention x Goal Desire					.12	.06	.24*			
(controlling for PBC)					.12	.06	.24*			
Goal Desire	Alcohol Intake (Study 2)	.35	.10	.35***	.35	.10	.35***			
Intention		.39	.10	.39***	.46	.10	.46***			
Intention x Goal Desire					.16	.06	.19**			
(controlling for PBC)					.16	.06	.19*			
Goal Desire	Alcohol Intake (Study 3)	.19	.12	.19	.23	.12	.23(*)	.29	.12	.29*
Intention		.45	.12	.45**	.48	.12	.48***	.46	.12	.46***

Goal Desire Stability	.16	.08	.16(*)	.25	.08	.25**	.11	.10	.11
Intention x Goal Desire				.16	.08	.17*	.19	.08	.20*
(controlling for PBC)				.16	.08	.16(*)	.17	.08	.17(*)
Intention x Goal Desire Stability				.17	.11	.17	.32	.13	.33*
Goal Desire x Goal Desire Stability				.14	.10	.17	.15	.10	.18
Intention x Goal Desire x Goal Desire Stability							.19	.09	.30*
(controlling for PBC)							.19	.09	.29*

Note: *p<.05; **p<.01; ***p<.0005 (all 2-tailed); (*)p<.05 (one-tailed).

None of the effects reported above were unreliable due to multicollinearity. None of the VIF values were greater than 10 (Myers, 1990) and all tolerance values were above 0.2 (Menard, 1995).

Table 3: Correlation between study variables (Study 2) (*N*=123)

	M	SD	1	2	3	4
1. Behavioural Intention (1-10)	5.89	2.85	-			
2. Goal Desire (1-10)	5.24	2.47	.72***	-		
3. Perceived Behavioural Control (1-10)	8.92	1.65	.46***	.30**	-	
4. Alcohol intake (units per week)	12.92	11.38	.64***	.63***	.26**	-

Note: *p<.05 (2-tailed); **p<.01 (2-tailed); ***p<.0005 (2-tailed)

Table 4: Correlation between study variables (Study 3) (*N*=95)

	M	SD	1	2	3	4
1. Behavioural Intention (1-7)	3.67	1.81	-			
2. Goal Desire (1-10)	5.06	2.26	.73***	-		
3. Goal Desire Stability	1.49	1.44	.07	-.04	-	
4. Perceived Behavioural Control (1-10)	8.50	1.81	.15	.07	-.19	-
5. Alcohol intake (units)	9.58	9.51	.57***	.52***	-.11	.26**

Note: *p<.05 (2-tailed); **p<.01 (2-tailed); ***p<.0005 (2-tailed)

Figure Captions:

Figure 1. Goal desire moderates the intention-fruit intake relationship cross-sectionally (Study 1).

Figure 2. Goal desire moderates the intention-fruit intake relationship prospectively (Study 1).

Figure 3. Goal desire moderates the intention-alcohol consumption relationship (Study 2).

Figure 4. Goal desire moderates the intention-alcohol consumption relationship (Study 3).

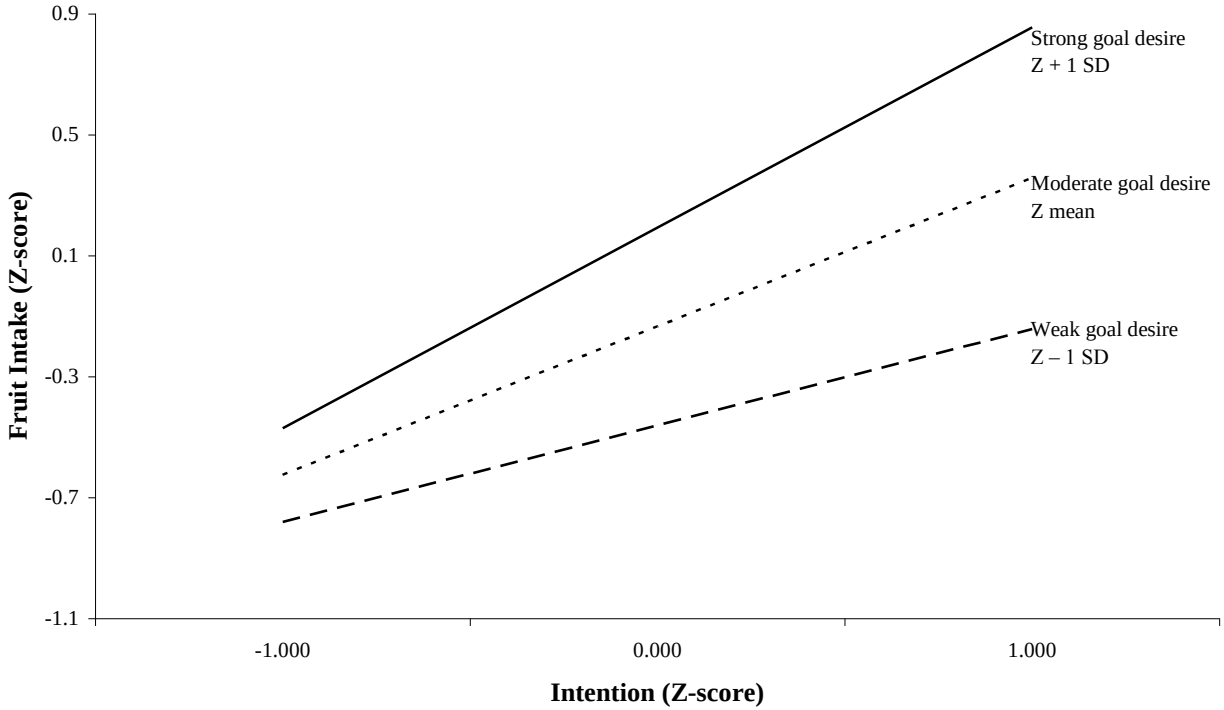
0.9
0.5
0.1
-0.3
-0.7
-1.1
Fruit Intake (Z-score)
-1.000
0.000
1.000
Intention (Z-score)
Strong goal desire
Z + 1 SD
Moderate goal desire
Z mean
Weak goal desire
Z – 1 SD

Figure 1.

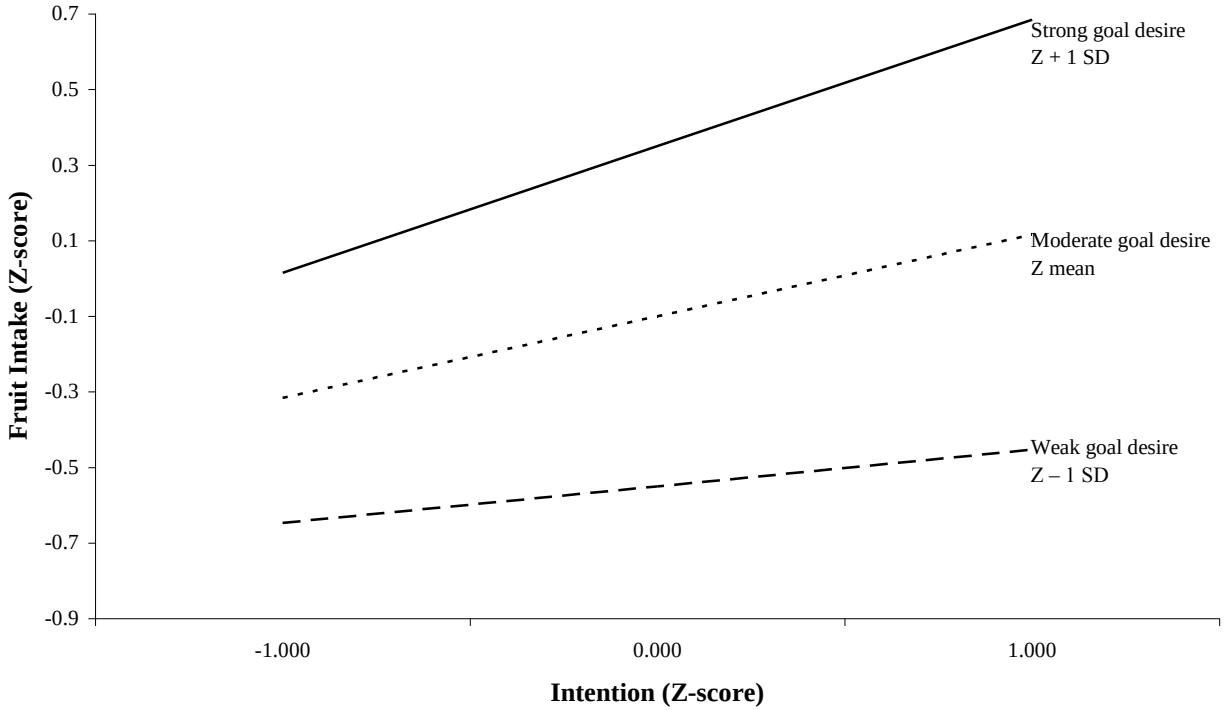
0.7
0.5
0.3
0.1
-0.1
-0.3
-0.5
-0.7
-0.9
Fruit Intake (Z-score)
-1.000
0.000
1.000
Intention (Z-score)
Strong goal desire
Z + 1 SD
Moderate goal desire
Z mean
Weak goal desire
Z – 1 SD

Figure 2.

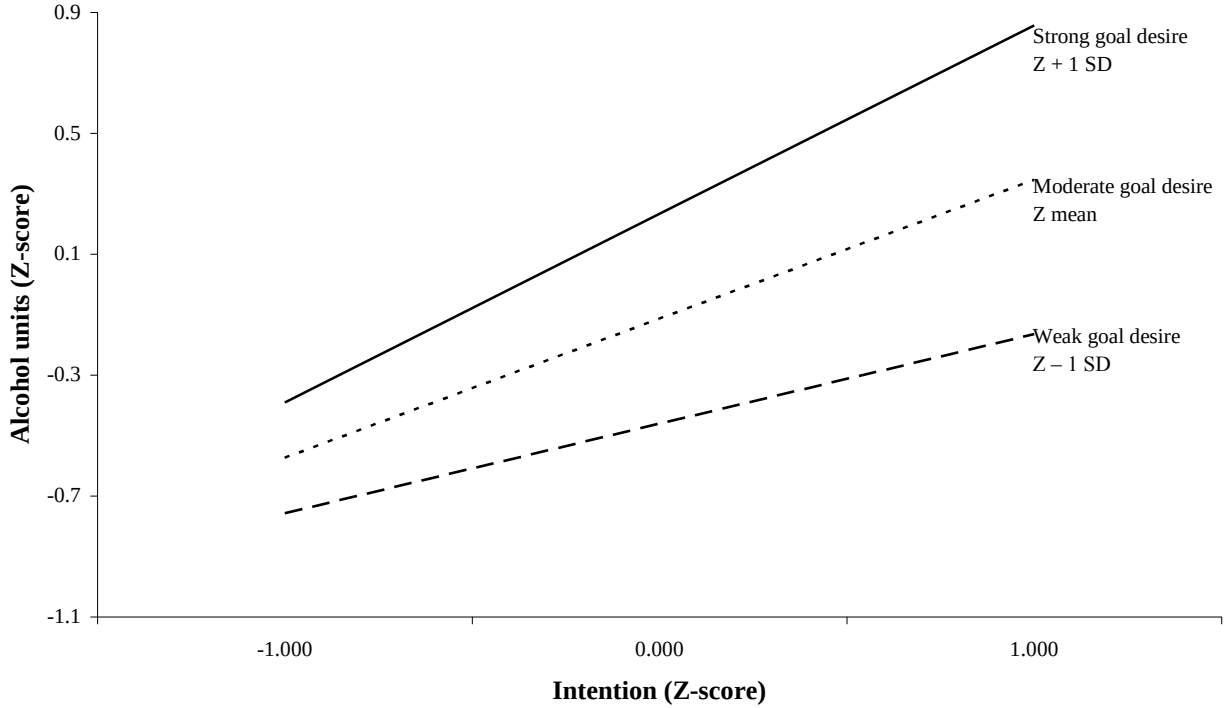
0.9
0.5
0.1
-0.3
-0.7
-1.1
Alcohol units (Z-score)
-1.000
0.000
1.000
Intention (Z-score)
Strong goal desire
Z + 1 SD
Moderate goal desire
Z mean
Weak goal desire
Z – 1 SD

Figure 3.

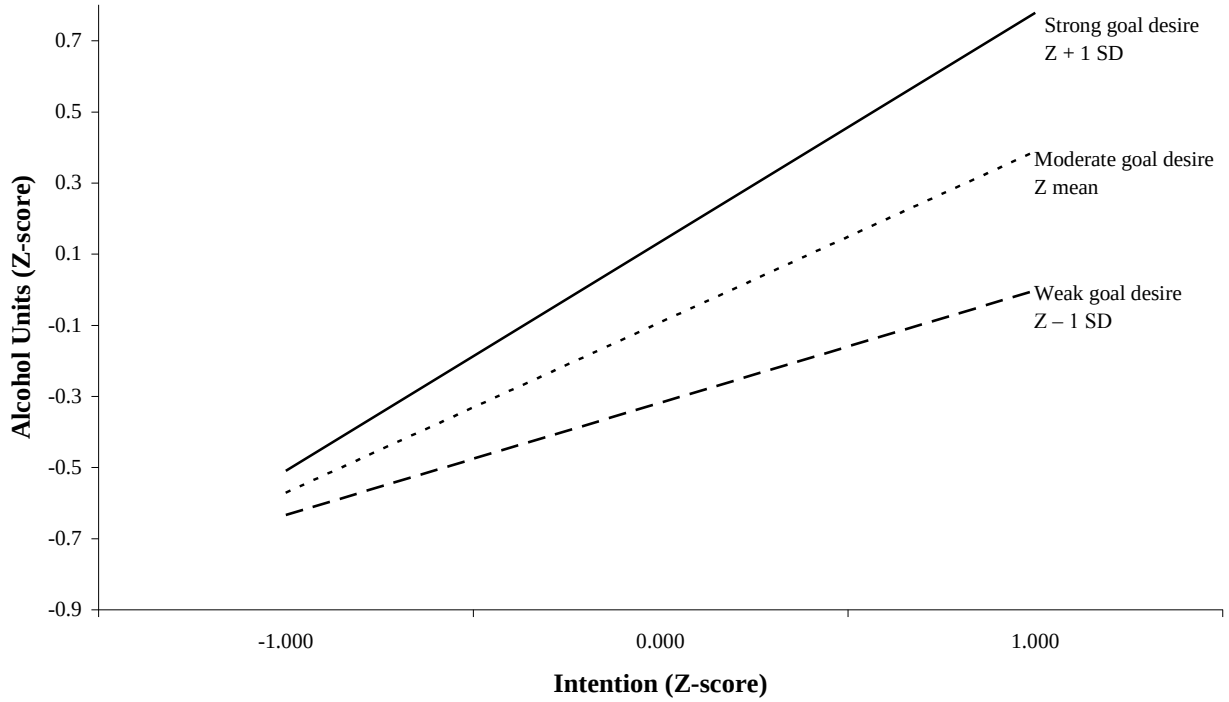
0.7
0.5
0.3
0.1
-0.1
-0.3
-0.5
-0.7
-0.9
Alcohol Units (Z-score)
-1.000
0.000
1.000
Intention (Z-score)
Strong goal desire
Z + 1 SD
Moderate goal desire
Z mean
Weak goal desire
Z – 1 SD

Figure 4.