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Self-efficacy and alcohol consumption: Are efficacy measures confounded with motivation?

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Abstract: Recent research has suggested self-efficacy measures (i.e., I can) are confounded with motivation (i.e., I will). The study tested whether two measurement conditions can disentangle motivation from self-efficacy in relation to alcohol consumption. Specifically, the study compared a standard self-efficacy measurement condition with a motivation held constant (i.e., including "If I really wanted to" in self-efficacy measures) and a vignette condition (i.e., clarifying the definition of "can" before self-efficacy measurements). A randomized posttest-only design was used. A sample of 259 university students were allocated to one of three conditions (standard; motivation held constant; vignette) and completed measures of self-efficacy and alcohol consumption. Greater self-efficacy towards both consuming and refraining from alcohol was found in the vignette (d = 0.58 & 0.74) and motivation held constant (d = 0.34 & 0.58) conditions. Heavy drinkers in the vignette (d = 1.48) and motivation held constant (d = 0.93) conditions reported greater self-efficacy for refraining from alcohol than the standard condition. Self-efficacy towards refraining from alcohol in the standard condition (r = −.55) was more highly correlated with alcohol behaviour than self-efficacy in the vignette condition (r = −.06). The study adds to the evidence that standard measures of self-efficacy are confounded with motivation. Providing a vignette clarifying the meaning of self-efficacy and including "If I really wanted to" in self-efficacy measures can overcome self-efficacy confounding.

Subjects: Health Promotion; Health Psychology; Applied Social Psychology
Keywords: Self-efficacy; motivation; perceived capability; alcohol consumption; health behaviour

1. Introduction

Excessive alcohol consumption is one of the leading causes of disease (World Health Organization, 2018) and can lead to serious detrimental health consequences such as cancer (Rehm et al., 2020), depression (Cheng et al., 2016), and increased mortality (Burton & Sheron, 2018). Although alcohol intake is a significant concern across age groups, it is a particular concern for students studying at university (Cameron et al., 2015; Davoren et al., 2016; Riordan & Carey, 2019). Indeed, research has shown students consume more alcohol than non-students (Carter et al., 2010; Kypri et al., 2005) and consumption increases when students begin university (Bewick et al., 2008; Turrisi et al., 2006). Excessive alcohol consumption whilst at university can lead to negative academic performance (Tembo et al., 2017), illness (Barnett et al., 2014), and risky behaviours (Jones et al., 2014). It can also contribute towards harmful drinking habits in later life (Stickley et al., 2013). It is therefore important to attend to this health-risk behaviour in this population.

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Theories of social cognition can be used to predict, explain, and change health behaviour (Conner & Norman, 2015). Self-efficacy is a key construct in many of these theories including Social Cognitive Theory (Bandura, 1986), the Theory of Planned Behaviour (Ajzen, 1991), and the Health Action Process Approach (Schwarzer, 2008). Defined as a person's perceived capability to perform a specific behaviour (Bandura, 1997), self-efficacy has demonstrated significant associations with various health-related behaviours including physical activity (Hamilton et al., 2017), smoking cessation (Baldwin et al., 2006), and healthy eating (Horton et al., 2018). Additionally, self-efficacy has also been found to be significantly associated with both engaging in and abstaining from alcohol consumption (Adamson et al., 2009; Cooke et al., 2016; DiBello et al., 2019; Kim & Kuan, 2020; Norman, 2011). For example, in a meta-analysis of theory of planned behaviour studies, Cooke et al. (2016) reported that self-efficacy to consume alcohol was strongly correlated with alcohol intentions (r_+ = .48) and behaviour (r_+ = .41). Moreover, DiBello et al. (2019) found a positive relationship between self-efficacy to limit alcohol consumption and subsequent reductions in consumption. Self-efficacy, then, appears important for both undertaking and abstaining from alcohol consumption.

Despite these significant associations, concerns have been raised regarding the operationalization and measurement of the self-efficacy construct (Williams & Rhodes, 2016). Participants providing information about their self-efficacy beliefs are often asked whether they "can do" the target behaviour. However, items addressing self-efficacy in this way may also inadvertently capture aspects of motivation if respondents interpret "can do" to mean "I can" or "I will" (Williams et al., 2020). Consequently, these measures may reflect the extent to which a person wants or intends to engage in a behaviour, rather than the extent to which they believe it is possible to do so (Williams & Rhodes, 2016). A participant with a weak intention may therefore provide a lower self-efficacy rating than a participant with a stronger intention because their rating, in part, reflects the strength of their intention. Thus, measures of self-efficacy are often confounded with motivation.

This confounding issue has both theoretical and practical implications. On a theoretical level, it is important that theory provides an accurate explanation of health behaviour (Hagger et al., 2017). However, if measures of self-efficacy are confounded with motivation then any correlation between self-efficacy and behaviour could, at least in part, reflect the importance of motivation rather than self-efficacy as a determinant of behaviour. Confounding measures would have consequences for the predictive utility and importance of social cognitive determinants. In particular, self-efficacy measures confounded with motivation may over-estimate the strength of the correlation between self-efficacy and behaviour, and therefore potentially overplay the theoretical importance of the self-efficacy construct in models of health behaviour. Failing to untangle potential confounds may therefore lead to inaccurate explanations, and models, of health behaviour.

In addition to theoretical issues, confounding constructs can pose practical problems. It is important that interventions designed to change health behaviour target relevant and important psychological mechanisms (Biddle et al., 2007). Confounding self-efficacy with motivation may ultimately lead to ineffective interventions due to targeting irrelevant determinants. For example, after undertaking formative work to establish the relative importance of social cognitive determinants, an intervention may incorrectly target self-efficacy when the main issue was motivational. This has obvious implications for intervention effectiveness and given the considerable resources and cost attached to developing and delivering behavioural interventions (Beard et al., 2019), it is important that they are based on an accurate understanding of the health behaviour.

Different approaches have been used to address this confounding issue. One way has been to hold motivation constant by including "If I really wanted to" in the stem of self-efficacy measures (Rhodes & Blanchard, 2007; Rhodes & Courneya, 2003, 2004). In a university student sample, Rhodes and Blanchard (2007) found that controlling for motivation in this way led to an increase in

self-efficacy ratings towards physical activity. Thus, perceptions of control were higher when the influence of motivation was removed from measures. Rhodes and Courneya (2003, 2004) tested the relationship between typical confidence items, with and without this stem, and the motivational construct of intention. They found stronger correlations between self-efficacy items and intention when this stem was absent versus when it was included. Thus, self-efficacy items without the stem appeared to be confounded with motivation whereas the self-efficacy items with the stem were not. Therefore, typical self-efficacy measures appear to also measure aspects of motivation, but holding motivation constant can disentangle the two constructs.

Rhodes et al. (2016) have also accounted for motivation by providing university students with vignettes in order to clarify the meaning of self-efficacy. Specifically, the vignettes were hypothetical stories illustrating the differences between a literal interpretation of self-efficacy (which includes motivation) and perceived capability (which does not include motivation). For example, one of the vignettes described how a character who did not want to encounter a perceived awkward situation (asking a person out for coffee), could do so if they actually wanted to. They found perceived capability (i.e., self-efficacy) towards walking and resistance training behaviours was higher after the vignettes. This suggests that an interpretation of self-efficacy confounded with motivation was adopted in the absence of the vignette, but the vignette successfully separated motivation from self-efficacy and led to increased perceptions of capability.

Lithopoulos et al. (2020a) examined both approaches to the confounding issue when assessing self-efficacy—i.e., holding motivation constant and adopting vignettes. They found higher self-efficacy scores in the vignette condition than the standard and motivation held constant conditions. Interestingly, they also examined the effect of condition on active and inactive participants. There were no differences in self-efficacy scores between conditions in relation to those meeting physical activity guidelines (as they were both motivated and confident), but among those not meeting physical activity guidelines self-efficacy was greater in the vignette condition. Finally, Lithopoulos et al. (2020b) manipulated outcome expectancies and examined whether manipulations altered self-efficacy ratings. They found that participants provided with an incentive to engage in physical activity showed greater self-efficacy scores than participants not provided with an incentive. Therefore, the manipulations appeared to not only influence participants' motivation, but also perceptions of capability.

Taken together, previous research has demonstrated that typical measures of self-efficacy are confounded with motivation. However, providing participants with vignettes that clarify the meaning of self-efficacy or holding motivation constant by including items clarifying stems (e.g., "If I really wanted to") can disentangle self-efficacy and motivation. In particular, self-efficacy ratings are higher when assessed under these conditions, as those with low motivation will not reduce mean self-efficacy ratings. As a result, the effect of these conditions appears to be particularly marked among those who do not perform the target behaviour (who are likely to have low levels of motivation). However, previous studies investigating this issue have focused almost exclusively on physical activity and, as far as we are aware, no study has focused on alcohol consumption.

1.1. The present study

The study investigated whether measures of self-efficacy in relation to consuming and refraining from alcohol are confounded with motivation in a university student sample. The study compared a standard condition in which participants completed standard self-efficacy measures with two conditions designed to control for motivation (a motivation held constant condition and a vignette condition). We were interested in whether self-efficacy differed between conditions with regards to both consuming and refraining from alcohol. We were also interested in whether conditions interacted with levels of alcohol consumption, i.e., those meeting recommended intake guidelines and those not.

Five hypotheses were tested:

(1) participants in the vignette and motivation held constant conditions will have greater self-efficacy towards both consuming and refraining from alcohol than the standard condition

(2) heavy drinkers will demonstrate greater self-efficacy towards consuming alcohol than light drinkers and light drinkers will demonstrate greater self-efficacy towards refraining from consuming alcohol than heavy drinkers

(3) there will be a significant interaction between condition and level of consumption in self-efficacy ratings for consuming alcohol, such that light drinkers in the vignette and motivation held constant conditions will have greater self-efficacy towards consuming alcohol than the standard condition

(4) there will be a significant interaction between condition and level of consumption in self-efficacy ratings for refraining from consuming alcohol, such that heavy drinkers in the vignette and motivation held constant conditions will have greater self-efficacy towards refraining from alcohol than the standard condition

(5) self-efficacy towards both drinking and refraining from alcohol in the standard condition will be more highly correlated with alcohol behaviour than self-efficacy in the vignette and motivation held constant conditions

2. Materials and methods

2.1. Participants

Participants were included if they were a university student and over the age of 18 years. Those receiving medication or treatment for a mental health condition were excluded from the study. A total of 259 participants (n = 141 Males; M = 21.14 years, SD = 2.99) were randomised into one of three conditions; standard condition (n = 86), motivation held constant condition (n = 84), and vignette condition (n = 89). Full demographics can be seen in Table 1.

2.2. Design and procedure

A randomized posttest-only design was adopted. Participants were recruited from a single university using university portals and social media platforms (e.g., Twitter). Interested participants accessed the study online through clicking the hyperlink or inserting the URL from the recruitment materials. After reading study information, interested participants then provided consent and their

Table 1. Demographics of study participants by condition

	Total (N = 259)	Standard (n = 86)	Motivation held constant (n = 84)	Vignette (n = 89)
Age	21.14 (2.99)	20.79 (2.39)	20.88 (2.21)	21.72 (3.96)
Gender				
Male	141 (55.44%)	56 (65.12%)	42 (50%)	43 (48.31%)
Female	118 (45.56%)	30 (34.88%)	42 (50%)	46 (51.69%)
Ethnicity				
White	202 (77.99%)	69 (80.23%)	64 (76.19%)	69 (77.53%)
Asian	37 (14.29%)	13 (15.12%)	13 (15.48%)	11 (12.36%)
Black	13 (5.02%)	3 (3.49%)	4 (4.76%)	6 (6.74%)
Mixed	7 (2.70%)	1 (1.16%)	3 (3.57%)	3 (3.37%)
Nationality				
British	227 (87.64%)	77 (89.53%)	74 (88.09%)	76 (85.39%)
Pakistani	17 (6.56%)	6 (6.98%)	8 (9.52%)	3 (3.37%)
Other	15 (5.79%)	3 (3.49%)	2 (2.38%)	10 (11.24%)

email address. Participants were then contacted via email with a survey link to one of the three conditions. An online random number generator was used to allocate participants to condition. Once participants had accessed and completed the survey, a debrief message was provided and participation was complete. The survey was completed remotely using Online Surveys. Participation was voluntary, and no compensation was provided. Ethical approval was granted by the University Faculty ethics committee prior to data collection.

2.3. Measures

All participants completed assessments of their self-efficacy towards both engaging in and refraining from alcohol over the next month. Participants also self-reported their alcohol consumption during the previous month. The following definition of alcohol consumption was provided: "Alcoholic beverages include wine, beer, lager, cider, and spirits". Participants also provided demographic details of age, gender, ethnicity, and nationality.

2.3.1. Self-efficacy

The Drinking Refusal Self-Efficacy Questionnaire-Revised (Oei et al., 2005) was used to measure self-efficacy. This instrument includes 19 items assessing self-efficacy towards alcohol refusal in different situations. Seven of these situations were used to assess both engaging in (Cronbach's $\alpha = .94$) and refraining from (Cronbach's $\alpha = .91$) alcohol consumption. These were: "When I am angry", "When my friends are drinking", "When I am at a pub or club", "When I am by myself", "When I am listening to music or reading", "When someone offers me a drink", and "When I am watching TV". All self-efficacy measures used 1–7 Likert scales (1 = Strongly disagree, 7 = Strongly agree), but the exact wording of items depended on the condition (as described below). Items assessing self-efficacy towards consuming and refraining from alcohol were separately averaged to provide single scores for consuming and refraining from alcohol. Higher scores represented greater self-efficacy towards both behaviours.

2.3.2. Alcohol consumption

Participants were asked to state how much alcohol they had consumed on each week during the previous month. Similar to Norman et al. (2019), a list of common drinks was made available in table format (e.g., pint of ordinary strength lager, beer or cider; glass of wine (175 ml); bottle of alcopops (275 ml)) and spaces were provided for participants to indicate how many times they had consumed each drink on each of the previous four weeks. These were then converted into units of consumption per week and summed to provide a measure of the number of alcohol units consumed within the previous month. Participants consuming an average of 14 units of alcohol or more per week were classified as heavy drinkers and those consuming below 14 units were classified as light drinkers (Department of Health, 2016).

2.4. Intervention conditions

2.4.1. Standard condition

Participants in the standard condition completed standard assessments of self-efficacy. Items assessed self-efficacy towards engaging in alcohol consumption in the seven situations (e.g., "I can engage in alcohol consumption over the next month when … ") and other items assessed self-efficacy towards refraining from alcohol consumption in the same seven situations (e.g., "I can refuse to engage in alcohol consumption over the next month when … ").

2.4.2. Motivation held constant condition

Participants in the motivation held constant condition responded to the same items used in the standard condition, but motivation was held constant by including "If I really wanted to" in the stem (e.g., "If I really wanted to, I can engage in alcohol consumption over the next month when … ").

2.4.3. Vignette condition

Participants in the vignette condition responded to the same items used in the standard condition but read two vignettes before completing the measures. The vignettes provided participants with examples of self-efficacy without motivation. The two stories were as follows:

Story 1: "John is lifting weights with his friend Ethan. Ethan loads several weights onto the barbell. John tells Ethan that he can't lift that much weight and, despite giving it his best effort, is proved correct."

Story 2: "Sarah asks Hannah if she wants to go for a drink after work. Hannah says she can't because she wants to stay in the office to complete a presentation. Sarah then thinks to herself that Hannah can, in fact, go for a drink if she really wanted to, she is just prioritising her work commitments."

When responding to measures, participants were instructed to use the interpretation of "can" from John in story 1 and not from Hannah in story 2. Participants then completed the self-efficacy items towards alcohol consumption. The vignettes were based on those previously used by Lithopoulos et al. (2020a).

2.5. Data analysis

2.5.1. Randomization check

Conditions were compared for demographics (age, gender, ethnicity, and nationality) and alcohol consumption. An ANOVA was used for continuous variables and a chi-square test was used for nominal variables.

2.5.2. Main analyses

A two-way ANOVA was used to examine the main and interaction effects of condition and alcohol quantity on self-efficacy for consuming alcohol and self-efficacy for refraining from alcohol. Specifically, condition (standard, motivation held constant, and vignette) and quantity (meeting guidelines and exceeding guidelines) were entered as the independent variables and self-efficacy was the dependent variable. Two separate ANOVAs were undertaken relating to self-efficacy for consuming and refraining from alcohol. Cohen's *d* was used to calculate effect sizes, with 0.2, 0.5, and 0.8 representing small, medium, and large effects, respectively (Cohen, 1988). To test whether correlations between self-efficacy and alcohol behaviour differed between conditions, Steiger's (1980) z-tests were conducted.

3. Results

3.1. Randomization check

There was no significant difference between conditions for age, F (2, 256) = 2.59, p = .07, gender, χ^2 (2, N = 259) = 5.96, p = .06, ethnicity, χ^2(6, N = 259) = 2.52, p = .86, nationality, χ^2(26, N = 259) = 28.96, p = .31, and alcohol consumption, χ^2(2, N = 259) = .33, p = .84 (see Table 1).

3.2. Self-efficacy for consuming alcohol

Significant main effects on self-efficacy for consuming alcohol were found for condition, F (2, 253) = 12.21, p < .001, η_p^2 = .088, and drinking quantity F (1, 253) = 94.67, p < .001, η_p^2 = .272. Post hoc tests indicated that the motivation held constant (M = 5.05, SD = 1.83, d = 0.34) and vignette (M = 5.46, SD = 1.65, d = 0.58) conditions had significantly greater self-efficacy scores than the standard condition (M = 4.41, SD = 1.97) (see Table 2). In relation to drinking quantity, heavy drinkers had significantly greater self-efficacy towards drinking (M = 5.86, SD = 1.08, d = 1.12) than light drinkers (M = 4.02, SD = 2.06). The interaction between condition and drinking quantity was non-significant, F (2, 253) = 2.50, p = .08, η_p^2 = .019.

Table 2. Means and standard deviations of self-efficacy scores by condition and alcohol quantity

		Total	Standard	Motivation held constant	Vignette
Heavy drinkers		*n* = 135	*n* = 47	*n* = 43	*n* = 45
	To consume	5.86 (1.08)	5.47 (1.26)	6.03 (.94)	6.11 (.88)
	To refrain	4.94 (1.53)	3.87 (1.56)	5.19 (1.28)	5.81 (.99)
Light drinkers		*n* = 124	*n* = 39	*n* = 41	*n* = 44
	To consume	4.02 (2.06)	3.13 (1.92)	4.03 (1.98)	4.80 (1.97)
	To refrain	5.95 (1.31)	5.81 (1.41)	6.10 (1.10)	5.94 (1.40)
Total		*N* = 259	*n* = 86	*n* = 84	*n* = 89
	To consume	4.98 (1.86)	4.41 (1.97)	5.05 (1.83)	5.46 (1.65)
	To refrain	5.42 (1.51)	4.75 (1.77)	5.64 (1.27)	5.87 (1.21)

Note. Heavy drinkers are classified as consuming an average of 14 units of alcohol or more per week; Light drinkers are classified as consuming below 14 units of alcohol per week

3.3. Self-efficacy for refraining from alcohol

Significant main effects on self-efficacy for refraining from alcohol were found for condition, F (2, 253) = 14.72, $p < .001$, $\eta_p^2 = .104$, and drinking quantity, F (1, 253) = 36.90, $p < .001$, $\eta_p^2 = .127$. Post hoc tests indicated that the motivation held constant ($M = 5.64$, $SD = 1.27$, $d = 0.58$) and vignette ($M = 5.87$, $SD = 1.21$, $d = 0.74$) conditions had significantly greater self-efficacy scores than the standard condition ($M = 4.75$, $SD = 1.77$) (see Table 2). Light drinkers had significantly greater self-efficacy towards refraining from alcohol ($M = 5.95$, $SD = 1.31$, $d = 0.71$) than heavy drinkers ($M = 4.94$, $SD = 1.53$). There was also a significant interaction between condition and drinking quantity, F (2, 253) = 10.37, $p < .001$, $\eta_p^2 = .076$ (see Figure 1). Specifically, heavy drinkers in the vignette ($M = 5.81$, $SD = 0.99$, $d = 1.48$) and motivation held constant ($M = 5.19$, $SD = 1.28$, $d = 0.93$) conditions had significantly greater self-efficacy than the standard condition ($M = 3.87$, $SD = 1.56$), and heavy drinkers in the vignette condition ($d = 0.54$) had significantly greater self-efficacy than the motivation held constant condition. There were no significant differences between conditions among light drinkers.

3.4. Differences in correlations between self-efficacy and alcohol consumption between conditions

In relation to self-efficacy for consuming alcohol, the correlations between self-efficacy scores and units consumed were similar in the standard ($r = .59$, $p < .001$), vignette ($r = .39$, $p < .001$), and motivation held constant ($r = .54$, $p < .001$) conditions. In relation to self-efficacy for refraining from alcohol, self-efficacy in the standard condition ($r = -.55$, $p < .001$) was more highly correlated with alcohol behaviour than self-efficacy in the vignette condition ($r = -.06$, $p = .61$), $z = -3.63$, $p < .001$, but there were no significant differences between the strength of the correlation in the motivation held constant condition ($r = -.36$, $p = .002$) and the other conditions.

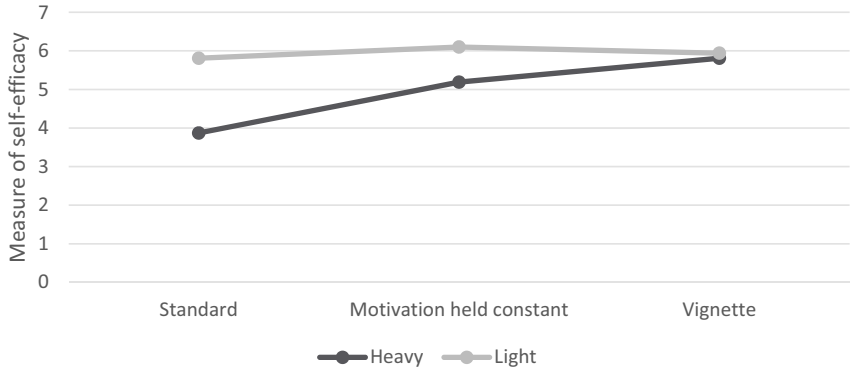

Figure 1. Interactions between condition and alcohol quantity in relation to self-efficacy to refrain from alcohol.

4. Discussion

The present study examined the confounding of self-efficacy measures with motivation in relation to alcohol consumption in a university student sample. As predicted, participants in the motivation held constant (including "If I really wanted to" in self-efficacy measures) and vignette (clarifying the definition of "can" before measuring self-efficacy) conditions had greater self-efficacy towards both consuming and refraining from alcohol than the standard condition. These medium-sized effects suggests both approaches usefully separate self-efficacy and motivation. These findings generally corroborate previous work in physical activity research (Lithopoulos et al., 2020a; Rhodes & Blanchard, 2007; Rhodes et al., 2016) and suggest that when motivation is accounted for, capability ratings are increased and are likely to be more accurate.

In line with expectations, self-efficacy towards consuming alcohol was greater in heavy drinkers whereas light drinkers demonstrated greater self-efficacy towards refraining from alcohol. This supports previous work showing self-efficacy is associated with both consuming and abstaining from alcohol consumption (e.g., Cooke et al., 2016; DiBello et al., 2019). Moreover, as predicted, there were no differences between conditions in self-efficacy ratings about consuming alcohol in heavy drinkers and about refraining from alcohol in light drinkers. This was likely due to ceiling effects; self-efficacy was already high in both cases due to current behaviour and motivation to either perform or not perform the behaviour. However, heavy drinkers in the vignette and motivation held constant conditions had significantly greater self-efficacy towards refraining from alcohol than the standard condition. These large-sized effects are likely due to the lack of a ceiling effect in heavy drinkers that enabled a more accurate account of perceptions to stop drinking to be gained. Interestingly, the vignette condition had greater self-efficacy scores than the motivation held condition. Therefore, although both approaches may lead to more accurate ratings of capability, it may be best to adopt vignettes when assessing self-efficacy for refraining from alcohol.

In contrast, the interaction between condition and drinking quantity in relation to self-efficacy for consuming alcohol was non-significant, although mean scores for the vignette and motivation held constant conditions were greater than the standard condition in light drinkers. This pattern suggests that when looking at light drinkers, removing motivation to not drink increases perceptions that alcohol can be undertaken. Taken together, study findings partly corroborate findings from Lithopoulos et al. (2020a) in relation to behavioural quantity and condition. Specifically, they found inactive participants in the vignette condition demonstrated higher self-efficacy scores towards physical activity, whereas the effect of condition on self-efficacy scores was non-significant among active participants. This suggests the approaches used to separate motivation from self-efficacy may depend on participants' current behaviour, although in the current study this was only found for self-efficacy in relation to refraining from alcohol.

In line with predictions, self-efficacy towards refraining from alcohol was more highly correlated with alcohol behaviour in the standard condition than self-efficacy in the vignette condition, although there were no differences in the strength of the correlations between self-efficacy about consuming alcohol and alcohol behaviour. As a result, only partial support was found for the suggestion that the strength of correlations between self-efficacy and behaviour varies depending on item measures. Specifically, for self-efficacy towards refraining from alcohol, removing motivation from measures weakens correlations with behaviour. This therefore suggests that some of the correlation between confounded measures of self-efficacy and behaviour may be due to levels of motivation.

The findings have implications for research relating to self-efficacy and alcohol consumption. When responding to typical self-efficacy items regarding alcohol consumption, participants in previous studies may have partly responded in terms of their motivation to either engage or refrain from drinking. That is, instead of perceiving they lack the ability to refrain from consuming alcohol, participants may have instead reflected a lack of motivation to do so. Similarly, instead of perceiving they do not have the ability to drink alcohol, participants may have reflected their strong motivation to not perform the behaviour. If

previous measures underestimated participants' capability to refrain from alcohol, interventions designed to reduce drinking behaviour would be limited if targeting self-efficacy. In such interventions, the focus should be on motivation towards drinking rather than, or in addition to, perceptions of capability. Given these potential implications for intervention effectiveness, it is therefore important that attention is given to the precise wording of self-efficacy measures when assessing the construct. Specifically, ensuring motivation is not considered when participants respond to items will ensure accurate measures of self-efficacy are gained and valid intervention targets are identified. The present study provides further evidence that providing participants with vignettes to clarify the meaning of self-efficacy is one way of reducing the potentially confounding effect of motivation. Researchers may therefore consider using similar vignettes if questionnaire space and time allows. However, vignettes can be onerous in terms of questionnaire space and completion time. Therefore, similar to physical activity research (e.g., Rhodes & Blanchard, 2007; Rhodes & Courneya, 2003, 2004), there could be times when holding motivation constant by including "If I really wanted to … " is the preferred approach.

There are limitations attached to the study that should be noted with interpreting the findings. First, the retrospective self-report method could have led to bias in measurements of alcohol consumption. However, as indicated by the randomisation checks, any under-reporting is likely be constant across the three conditions. Nevertheless, we would encourage replication attempts, especially as this is the first study examining this issue in relation to alcohol consumption. Second, the university student sample used may limit the generalizability of the findings. Although students are a high-risk group for harmful patterns of drinking, it would be useful for future research to include more diverse samples, and to consider socioeconomic status. Third, the adopted correlational design means statements of causality cannot be made when considering associations between self-efficacy ratings and alcohol consumption. Finally, since we did not measure motivation, it cannot be certain that findings are only attributed to self-efficacy. Therefore, in addition to measures of self-efficacy, future work should consider including a direct measure of motivation.

5. Conclusion

The study examined the extent to which typically used self-efficacy measures in relation to alcohol consumption are confounded with motivation. The results showed that, in a university student sample, two conditions developed to isolate self-efficacy from motivation, i.e., including a stem to hold motivation constant and providing vignettes to define capability, led to increased capability ratings in line with predictions. Findings therefore add to the accumulating evidence that many studies assessing the self-efficacy construct may confound the construct with motivation. This has important implications for both explaining and changing health behaviour. Researchers should therefore carefully consider how self-efficacy is measured. To facilitate this, adopting either of the approaches used in the study could usefully isolate self-efficacy from motivation, although specifically adopting vignettes may be more beneficial.

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The data that support the findings of this study are available from the corresponding author upon reasonable request.

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References

Adamson, S. J., Sellman, J. D., & Frampton, C. M. A. (2009). Patient predictors of alcohol treatment outcome: A systematic review. *Journal of Substance Abuse Treatment*, *36*(1), 75–86. https://doi.org/10.1016/j.jsat.2008.05.007

Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, *50*(2), 179–211. https://doi.org/10.1016/0749-5978(91)90020-T

Baldwin, A. S., Rothman, A. J., Hertel, A. W., Linde, J. A., Jeffery, R. W., Finch, E. A., & Lando, H. A. (2006). Specifying the determinants of the initiation and maintenance of behavior change: An examination of self-efficacy, satisfaction, and smoking cessation. *Health Psychology*, *25*(5), 626–634. https://doi.org/10.1037/0278-6133.25.5.626

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Prentice-Hall, Inc.

Bandura, A. (1997). *Self-efficacy: The exercise of control*. W.H. Freeman and Co.

Barnett, N. P., Clerkin, E. M., Wood, M., Monti, P. M., Tevyaw, T. O. L., Corriveau, D., Fingeret, A., & Kahler, C. W. (2014). Description and predictors of positive and negative alcohol-related consequences in the first year of college. *Journal of Studies on Alcohol and Drugs*, *75*(1), 103–114. https://doi.org/10.15288/jsad.2014.75.103

Beard, E., West, R., Lorencatto, F., Gardner, B., Michie, S., Owens, L., & Shahab, L. (2019). What do cost-effective health behaviour-change interventions contain? A comparison of six domains. *PLOS ONE*, *14*(4), e0213983. https://doi.org/10.1371/journal.pone.0213983

Bewick, B. M., Mulhern, B., Barkham, M., Trusler, K., Hill, A. J., & Stiles, W. B. (2008). Changes in undergraduate student alcohol consumption as they progress through university. *BMC Public Health*, *8*(1), 163. https://doi.org/10.1186/1471-2458-8-163

Biddle, S. J. H., Hagger, M. S., Chatzisarantis, N. L. D., & Lippke, S. (2007). Theoretical frameworks in exercise psychology. In G. Tenenbaum & R.C. Eklund (Eds.), *Handbook of sport psychology* (3rd ed., pp. 537–559). John Wiley & Sons, Inc.

Burton, R., & Sheron, N. (2018). No level of alcohol consumption improves health. *The Lancet*, *392*(10152), 987–988. https://doi.org/10.1016/S0140-6736(18)31571-X

Cameron, D., Epton, T., Norman, P., Sheeran, P., Harris, P. R., Webb, T. L., Julious, S. A., Brennan, A., Thomas, C., Petroczi, A., Naughton, D., & Shah, I. (2015). A theory-based online health behaviour intervention for new university students (U@Uni: LifeGuide):results from a repeat randomized controlled trial. *Trials*, *16*(1), 555. https://doi.org/10.1186/s13063-015-1092-4

Carter, A. C., Brandon, K. O., & Goldman, M. S. (2010). The college and noncollege experience: A review of the factors that influence drinking behavior in young adulthood. *Journal of Studies on Alcohol and Drugs*, *71*(5), 742–750. https://doi.org/10.15288/jsad.2010.71.742

Cheng, H. G., Chen, S., McBride, O., & Phillips, M. R. (2016). Prospective relationship of depressive symptoms, drinking, and tobacco smoking among middle-aged and elderly community-dwelling adults: Results from the China health and retirement longitudinal study (CHARLS). *Journal of Affective Disorders*, *195*, 136–143. https://doi.org/10.1016/j.jad.2016.02.023

Cohen, J. (1988). *Statistical power analysis for the behavioral sciences*. Routledge Academic.

Conner, M., & Norman, P. (2015). Predicting and changing health behaviour: A social cognition approach. In M. Conner & P. Norman (Eds.), *Predicting and changing health behaviour: Research and practice with social cognition models* (pp. 1–29). Open University Press.

Cooke, R., Dahdah, M., Norman, P., & French, D. P. (2016). How well does the theory of planned behaviour predict alcohol consumption? A systematic review and meta-analysis. *Health Psychology Review*, *10*(2), 148–167. https://doi.org/10.1080/17437199.2014.947547

Davoren, M. P., Demant, J., Shiely, F., & Perry, I. J. (2016). Alcohol consumption among university students in Ireland and the United Kingdom from 2002 to 2014: A systematic review. *BMC Public Health*, *16*(1), 173. https://doi.org/10.1186/s12889-016-2843-1

Department of Health. (2016, August). *UK chief medical officers' low risk drinking guidelines*. https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/545937/UK_CMOs__report.pdf

DiBello, A. M., Miller, M. B., & Carey, K. B. (2019). Self-efficacy to limit drinking mediates the association between attitudes and alcohol-related outcomes. *Substance Use & Misuse*, *54*(14), 2400–2408. https://doi.org/10.1080/10826084.2019.1653322

Hagger, M. S., Gucciardi, D. F., & Chatzisarantis, N. L. D. (2017). On nomological validity and auxiliary assumptions: The importance of simultaneously testing effects in social cognitive theories applied to health behavior and some guidelines. *Frontiers in Psychology*, *8*, 1933. https://doi.org/10.3389/fpsyg.2017.01933

Hamilton, K., Warner, L. M., & Schwarzer, R. (2017). The role of self-efficacy and friend support on adolescent vigorous physical activity. *Health Education & Behavior*, *44*(1), 175–181. https://doi.org/10.1177/1090198116648266

Horton, S. E. B., Timmerman, G. M., & Brown, A. (2018). Factors influencing dietary fat intake among black emerging adults. *Journal of American College Health*, *66*(3), 155–164. https://doi.org/10.1080/07448481.2017.1390669

Jones, K. A., Chryssanthakis, A., & Groom, M. J. (2014). Impulsivity and drinking motives predict problem behaviours relating to alcohol use in University students. *Addictive Behaviors*, *39*(1), 289–296. https://doi.org/10.1016/j.addbeh.2013.10.024

Kim, Y., & Kuan, G. (2020). Relationship between alcohol consumption and drinking refusal self-efficacy among university students: The roles of sports type and gender. *International Journal of Environmental Research and Public Health*, *17*(12), 4251. https://doi.org/10.3390/ijerph17124251

Kypri, K., Cronin, M., & Wright, C. (2005). Do University students drink more hazardously than their non-student peers? *Addiction*, *100*(5), 713–714. https://psycnet.apa.org/doi/10.1111/j.1360-0443.2005.01116.x

Lithopoulos, A., Grant, S. J., Williams, D. M., & Rhodes, R. E. (2020a). Experimental comparison of physical activity self-efficacy measurement: Do vignettes reduce motivational confounding? *Psychology of Sport and Exercise*, *47*, 101642. https://doi.org/10.1016/j.psychsport.2019.101642

Lithopoulos, A., Williams, D. M., & Rhodes, R. E. (2020b). Effect of changes of outcome expectations on physical activity self-efficacy ratings: A test of hypothetical incentives among mothers of young children. *Sport, Exercise, and Performance Psychology*, *9*(3), 450–460. https://psycnet.apa.org/doi/10.1037/spy0000176

Norman, P. (2011). The theory of planned behavior and binge drinking among undergraduate students: Assessing the impact of habit strength. *Addictive Behaviors*, *36*(5), 502–507. https://doi.org/10.1016/j.addbeh.2011.01.025

Norman, P., Webb, T. L., & Millings, A. (2019). Using the theory of planned behaviour and implementation intentions to reduce binge drinking in new university students. *Psychology & Health*, *34*(4), 478–496. https://doi.org/10.1080/08870446.2018.1544369

Oei, T. P. S., Hasking, P. A., & Young, R. M. (2005). Drinking refusal self-efficacy questionnaire-revised (DRSEQ-R): A new factor structure with confirmatory factor analysis. *Drug and Alcohol Dependence*, *78*(3), 297–307. https://psycnet.apa.org/doi/10.1016/j.drugalcdep.2004.11.010

Rehm, J., Shield, K. D., & Weiderpass, E. (2020). Alcohol consumption. A leading risk factor for cancer. *Chemico-Biological Interactions*, *331*, 109280. https://doi.org/10.1016/j.cbi.2020.109280

Rhodes, R. E., & Blanchard, C. M. (2007). What do confidence items measure in the physical activity domain? *Journal of Applied Social Psychology*, *37*(4), 759–774. https://doi.org/10.1111/j.1559-1816.2007.00184.x

Rhodes, R. E., & Courneya, K. S. (2003). Self-efficacy, controllability, and intention in the theory of planned behavior: Measurement redundancy or causal Independence? *Psychology and Health*, *18*(1), 79–91. https://doi.org/10.1080/0887044031000080665

Rhodes, R. E., & Courneya, K. S. (2004). Differentiating motivation and control in the theory of planned behavior. *Psychology, Health and Medicine*, *9*(2), 205–215. https://doi.org/10.1080/13548500410001670726

Rhodes, R. E., Williams, D. M., & Mistry, C. D. (2016). Using short vignettes to disentangle perceived capability from motivation: A test using walking and resistance training behaviors. *Psychology, Health & Medicine*, *21*(5), 639–651. https://doi.org/10.1080/13548506.2015.1074710

Riordan, B. C., & Carey, K. B. (2019). Wonderland and the rabbit hole: A commentary on university students' alcohol use during first year and the early transition to university. *Drug and Alcohol Review*, *38*(1), 34–41. https://doi.org/10.1111/dar.12877

Schwarzer, R. (2008). Modeling health behavior change: How to predict and modify the adoption and maintenance of health behaviors. *Applied Psychology*, *57*, 1–29. https://doi.org/10.1111/j.1464-0597.2007.00325.x

Steiger, J. H. (1980). Tests for comparing elements of a correlation matrix. *Psychological Bulletin*, *87*(2), 245–251. https://psycnet.apa.org/doi/10.1037/0033-2909.87.2.245

Stickley, A., Koyanagi, A., Koposov, R., Razvodovsky, Y., & Ruchkin, V. (2013). Adolescent binge drinking and risky health behaviours: Findings from northern Russia. *Drug and Alcohol Dependence*, *133*(3), 838–844. https://doi.org/10.1016/j.drugalcdep.2013.08.028

Tembo, C., Burns, S., & Kalembo, F. (2017). The association between levels of alcohol consumption and mental health problems and academic performance among young university students. *PLoS One*, *12*(6), e0178142. https://doi.org/10.1371/journal.pone.0178142

Turrisi, R., Mallett, K. A., Mastroleo, N. R., & Larimer, M. E. (2006). Heavy drinking in college students: Who is at risk and what is being done about it? *The Journal of General Psychology*, *133*(4), 401–420. https://doi.org/10.3200/GENP.133.4.401-420

Williams, D. M., Dunsiger, S., Emerson, J. A., Dionne, L., Rhodes, R. E., & Beauchamp, M. R. (2020). Are self-efficacy measures confounded with motivation? An experimental test. *Psychology & Health*, *35*(6), 685–700. https://doi.org/10.1080/08870446.2019.1683179

Williams, D. M., & Rhodes, R. E. (2016). The confounded self-efficacy construct: Conceptual analysis and recommendations for future research. *Health Psychology Review*, *10*(2), 113–128. https://doi.org/10.1080/17437199.2014.941998

World Health Organization. (2018). *Global status report on alcohol and health*.

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